

Study on Functional Airspace Blocks

Final Report

**EC Specific Contract
MOVE E2/SER/2016-194/SI2.735467**

January 2017



Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

<i>Deliverable:</i>	<i>Final Report</i>
<i>Project:</i>	<i>Study on Functional Airspace Blocks</i>
<i>Contract:</i>	<i>Specific Contract MOVE E2/SER/2016-194/SI2.735467</i>
<i>Contracted by:</i>	European Commission, DG MOVE
<i>Produced by:</i>	Integra A/S (lead) ECORYS Nederland BV Winsland Consulting Combitech
<i>Date:</i>	25 January 2017 (amendments 22 February 2017)

Disclaimer:

This report has been produced for the European Commission DG MOVE by the consortium led by Integra A/S. The information and views set out in this report are those of the authors and do not necessarily reflect the official opinion of the Commission. Neither the Commission nor any person acting on the Commission's behalf may be held responsible for the use which may be made of the information contained therein.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Executive Summary

The Study on Functional Airspace Blocks (FABs) was conducted upon request of the European Commission (DG MOVE).

This Executive Summary outlines the study background and objectives, the applied methodology, the outcome of the stakeholder consultation process, and the overall conclusions and recommendations. In order to avoid any misinterpretation due to a lack of contextual information, the results of the FAB benchmarking exercise are not displayed in the executive summary but can be found in Chapter 4 of the report.

Study background and objectives

Functional airspace blocks (FABs) constitute one of the cornerstones of the Single European Sky legislation and policy. FABs are multi-State arrangements based on operational requirements and established regardless of State boundaries. FABs aim to reduce the fragmentation of the European ATM network and thus to improve performance.

Pursuant to the SES legislation, Member States have the legal obligation to implement FABs. Accordingly, nine FABs have been formed:

- Baltic FAB (Lithuania, Poland);
- BLUE MED FAB (Cyprus, Greece, Italy and Malta);
- Danube FAB (Bulgaria, Romania);
- DK-SE FAB (Denmark, Sweden);
- FAB CE (Austria, Bosnia & Herzegovina, Croatia, Czech Republic, Hungary, Slovak Republic, Slovenia);
- FABEC (Belgium, France, Germany, Luxemburg, the Netherlands and Switzerland);
- NEFAB – North European FAB (Estonia, Finland, Latvia, and Norway);
- South West FAB (Portugal, Spain);
- UK-Ireland FAB.

The general objective of this study, conducted on behalf of the EC DG MOVE, is to assess the organisational, operational and technical progress of FABs since their creation in December 2012. The specific objectives of the study are to:

- Review progress of FAB implementation.
- Gather views of operational stakeholders.
- Define measurable benchmarking criteria and identify best practices.
- Benchmark FABs against the applied criteria.
- Provide recommendations for the further development and implementation of FABs.

Methodology

The study methodology is based on a multidisciplinary approach covering all the key aspects of FAB implementation, i.e. the regulatory/institutional, technical/operational, and economic/financial dimensions.

Data and materials for the study were collected from public sources, from the EU level and directly from FABs (on ANSP and NSA level). The study team requested each FAB to respond to two data collection questionnaires (one for ANSPs and another for NSAs)

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

which aimed to collect the most up-to-date factual data and information concerning the status and developments of each FAB. Additional data and documentation were gathered through information requests to FAB focal points.

The study team validated, complemented and clarified the received data through interviews with FAB representatives. A final workshop for internal FAB stakeholders (ANSP and NSA representatives) was held for the purpose of discussing FAB best practices and exploring solutions and mechanisms for their practical implementation.

A comprehensive stakeholder consultation process was conducted with a view to understanding how the FABs meet the stakeholders' needs and expectations, and what are the related key issues and challenges encountered by stakeholders. Stakeholder views were collected through an online stakeholder survey as well as interviews.

The progress made by FABs has been appraised through a benchmarking analysis, built upon 10 benchmarking criteria. The FAB benchmarking criteria were developed considering the applicable regulatory requirements, the policy expectations set on FABs, the review of FAB documentation and the views collected through our stakeholder survey.

The criteria used for the benchmarking analysis are the following:

1. **FAB geographic and operational scale** – The FABs should be large enough to support economies of scale.
2. **The scope of FAB activities** – The broader the scope of activities, the greater the potential to deliver against the SES performance goals.
3. **FAB business planning and development** – The FAB business plan should demonstrate how the ambitions of the FAB will be achieved and updated annually.
4. **Optimised operations and consolidation** – The FABs should transition towards consolidated/integrated operations, including ATFCM, ASM.
5. **Technical harmonisation and rationalisation** – The FABs should apply an integrated approach to technical systems and the deployment of new technology.
6. **Network integration and support to network level operations** – The FABs should cooperate with the Network Manager, other FABs and third countries with a view to maximising network benefits.
7. **FAB governance and customer engagement** – The decision making structures and processes at all FAB levels should enable the effective implementation of FAB objectives. FABs should demonstrate strong customer engagement and focus.
8. **Management of the FAB social dimension** – The FABs should ensure a regular social dialogue regarding the FAB implementation.
9. **NSA level cooperation** – The NSA level cooperation and coordination within the FABs should ensure effective implementation of FAB objectives.
10. **Development of FAB common charging zone** – FABs should develop common charging zones that deliver operational and/or environmental improvements.

The results of the conducted benchmarking analysis (including scores per criterion and per FAB) can be found in Chapter 4 of the report.

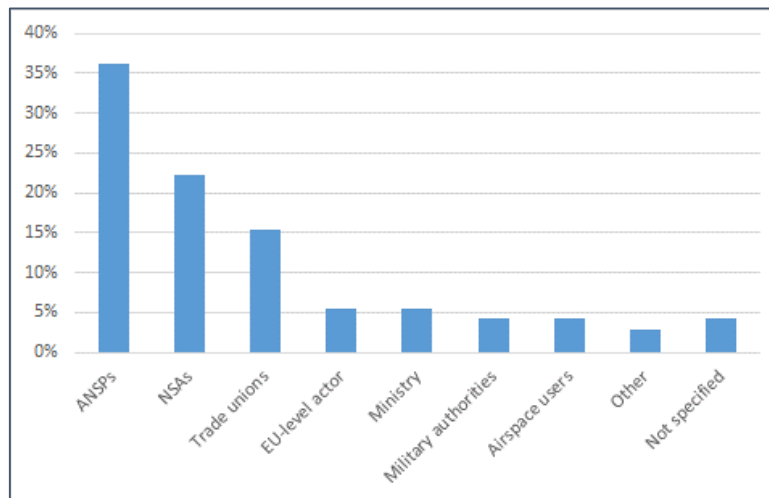
Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

Stakeholder views

The online stakeholder survey for this study ran from 31 August to 30 September 2016. The purpose of the survey was to gather stakeholder views on FAB implementation in general, not in relation to specific FABs.

In total 56 complete survey responses and 16 partial responses were received from stakeholders. The distribution of respondents per stakeholder group (as percentage of total responses) is illustrated in the figure below. Survey responses were complemented and substantiated through stakeholder interviews.

Figure 1 Distribution of survey responses per stakeholder group



The outcome of the stakeholder survey is summarised below per analytical domain.

Regulatory and institutional dimensions

- Respondents considered that the current FABs are not consistent with the definition set out in the SES legislation (art. 2(25), EU Reg. 549/2004).
- FABs were widely seen to have generated high administrative costs that are not fully offset by the operational and performance benefits, as a consequence of the lack of ambition to implement FABs and the absence of formalised shared accountability for FAB performance.
- Respondents highlighted that a more performance and market based approach would be needed to drive change.
- A number of respondents suggested that the development of FABs should be based on a "bottom-up" approach and partnerships. A "top-down" approach forcing ANSPs to achieve reorganisation of airspace cannot be successful when entities find themselves to some extent in competition.
- Existing FAB objectives and outcomes were not found to be adequate. National sovereignty aspects and interests related to the control of national ANSPs were seen to limit the potential of FABs in terms of benefits to airspace users.
- According to the airspace users, the failure to implement FABs is not due a flawed policy setting or to lack of regulatory clarity, but rather to inadequate implementation, a lack of political willingness and ambition.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Technical and operational dimensions

- Respondents regarded FABs as having the highest potential in improved airspace configuration and management, and have made the most progress in this area. There was a difference in opinion as to whether the improvements are due to coordination from FABs or the Network Manager.
- Respondents also highlighted the continuing difficulties with cross border airspace optimisation due to military or other sovereignty concerns, although there was doubt from some as to whether the military really is the blocking factor. In regards to the flexible use of airspace, States and military respondents tend to view this as a national process, predating the SES.
- A general theme from respondents' comments was whether FAB projects could have been implemented without the FAB existing. I.e. is the FAB driving progress or has it become a grouping of national and regional projects that would have been done anyway.
- Airspace users do not feel they have been involved in any meaningful way in FAB developments, with little to no consultation or progress updates.
- FAB plans are generally seen as supporting performance improvements but criticisms were that they were either unrealistic or lacking ambition.
- FABs were not particularly seen as driving common technology or interoperability, with limiting factors seen mostly as financial or political.
- FABs were not seen as enhancing safety.

Economic and financial dimensions

- Regarding benefits to airspace users, respondents indicate that benefits have been higher in the area of flight efficiency, i.e. cost savings resulting from reduced fuel burn, compared to cost savings from reduced delays. Delays are said to be generated at the local level or caused by external factors, neither of which can be addressed by the FABs. At the same time, many FABs do not experience delays, therefore removing any potential impact.
- The main driver of benefits has been the implementation of cross-border airspace structures, in particular FRA and more direct routing. Many respondents contend that the FAB initiatives which contributed to the benefits that have materialised (i.e. from the implementation of FRA) would have been established regardless of the FABs regulation, however the FABs sped up the process of establishing the FRAs.
- The common charging zone has not been the focus of FABs, but rather FABs have focused on targeting improved service quality through the establishment of FRA.
- Costs have significantly outweighed benefits since the creation of FABs. At the same time, the majority of respondents offer a positive assessment of the future potential of the FABs, expecting that the initial investment will bring benefits going forward. The long-term potential for FABs to become the preferred vehicle to fulfil more challenging performance requirements will depend, however, on the ability of stakeholders to set such requirements in the future.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Conclusions

FABs have not met the high level policy objectives set by the SES legislation, despite the substantial efforts undertaken for their implementation. There is a widely shared opinion, reflected in the results of our stakeholder survey, that the FABs have not overall reached the set policy expectations. The most critical views were expressed by airspace users, who voiced their strong disappointment with the results of FABs and as regards FAB customer engagement.

The implementation of the FAB concept appears to have revolved too much around the aim of ensuring formal, minimal regulatory compliance, whilst efficiency gains have been held back by political, legal and technical impediments. Hence, FABs have not overall generated the benefits foreseen before their implementation. Progress has been particularly slow as regards the rationalisation of services and the related resource optimisation.

In terms of operational cooperation, several FABs have made progress on the implementation of Free Route Airspace. This was identified as the most valuable benefit and achievement of FABs to date by stakeholders. However, it is our view that this PCP initiative, coordinated by the Network Manager as part of the ERNIP, would probably have progressed irrespective of FAB structures.

There is no strong support among stakeholders to abandon the FAB concept as the lack of progress is seen to result from an inadequate implementation of existing requirements.

Key conclusions in the institutional and regulatory domain

The decision-making in all FABs is based on the consensus principle (unanimity) which entails challenges in particular for multi-State FABs. For example, a FAB level project may not be endorsed if it does not generate distinct benefits to each FAB member, even if the overall added value of the project for the FAB and the ANS network is clearly demonstrated.

The institutional structures in place across the various FABs are largely similar and reflect the State, NSA and ANSP levels of the FAB concept.

The conducted stakeholder survey highlighted that the current engagement of military users in the FAB activities needs to be further enhanced, in particular to remove constraints around the flexible use airspace.

FAB administrative and technical support functions are seen as important enablers for the successful governance and implementation of FABs.

NSA cooperation was found to be making progress within all the FABs. However, there is still room for improvement and NSAs within many FABs are planning to develop their cooperation further.

There are wide differences between FABs as regards the transparency of activities. Whilst some FABs systematically publish annual activity reports and implementation plans, others provide only limited or no public information on the FAB progress.

Most of the FABs have established an annual consultation mechanism of airspace users in respect of the FAB implementation, but only one FAB has enabled the direct involvement of airspace user representatives in its governance structures.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

In the majority of FABs, there is a formal setup for FAB level social dialogue. However, in many FABs, social dialogue has been inadequate in practice, as the established mechanisms have been dormant.

Key conclusions in the technical and operational domain

From an operational perspective, there are limitations for FABs that are either small (typically 2-State) or are on the periphery of EU airspace and hence have less traffic to influence through an operational partnership. Furthermore, those FABs with limited traffic flows between States will not necessarily create much greater operational efficiency by grouping together, as there will still remain limited flows between States.

The scope of FABs has been examined and may be limiting in respect of excluding TMA and related services and infrastructure. However, it is also the case that FABs who have excluded TMA have cited TMA-related projects in their achievements. This leads the study to conclude that the FABs should simplify their scope by stating that it includes all ANS and related infrastructure and services.

The majority of FAB plans are high level and conceptual as opposed to concrete business plans. Without sufficient detail in its business planning it is not clear how the FAB can have confidence that the operational concepts defined will be delivered on.

FABs are claiming as FAB initiatives developments such as FRA, which is required by the ERNIP (as responsibility for coordination of FRA falls on the Network Manager) and the Pilot Common Project Reg (EU) 716/2014. However, these are not essentially FAB initiatives as they should have happened anyway, assuming compliance with the regulation and support of ERNIP/Level 3 of the European ATM Master Plan.

In general the FAB plans are more statements of aspiration and articulate short term project goals; they are not a comprehensive road map to a defined point to deliver against the SES targets. Furthermore, the end state is not well articulated.

In many instances, the FABs seem to be superseded by Industrial Partnerships, particularly the smaller FABs. Stakeholders have specifically highlighted the results achieved within the BOREALIS and COOPANS alliances. Thus these partnerships may become more important than FABs in driving at least technological progress.

The Performance Scheme implementation at FAB level has not led to a truly FAB-level approach: FAB targets are an aggregation of national targets with either no or very limited FAB synergies.

Aside from the technology issue, the focus of FABs is almost exclusively on airspace optimisation. There is very little evidence, if any, of FABs driving the attainment of the SES targets, particularly user charges. Hence FABs are not driving a step changing in efficiency and thus costs, even in services such as ATCO training, AIS and MET.

Key conclusions in the economic and financial domain

FAB targets and reporting under the Performance Scheme are based on blending the constituent ANSP performance plans. FABs do not operate or have any form of FAB-wide financial planning or accountability.

FABs do not have real business plans. The FAB is seen as an umbrella for some states to undertake projects together – it is not seen to have an economic or financial dimension. Thus the FAB contributions to the SES cost effectiveness targets are a

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

product of project outcomes and individual state initiatives, rather than any financial plan of the FAB.

Combining the CBAs and ANSP responses to the FAB survey shows that more benefits have been achieved for flight efficiency than for delays. This echoes the response to the stakeholder survey.

Only a few FABs have reported on ANSP costs savings in the CBAs; rather they have reported on benefits for users. Most of the CBAs have not been updated since they were first produced to meet regulatory requirements in 2012. They are thus not current and not living documents used in managing the FAB.

Most projected benefits have not been realised yet in full, due to delays in the implementation of projects.

Resource efficiency does not seem to have been the key target for FABs. Instead the focus has been on the implementation of projects that would benefit users and are required under the European ATM Master Plan (Level 3) or to support SESAR.

FRA seems to have been a key source of achieved benefits. However, the FRA improvements also could probably have been realised without FABs.

FABs seem reluctant to move towards a single FAB level charging zone. This corroborates that FABs focus on service quality rather than cost efficiency.

Recommendations

The study recommendations aim to provide a narrower focus to FAB policy, positioning FABs as a means to an end and complementary to other actions such as industrial partnerships.

Whilst we propose that the expectation on FABs should be lowered, there are additional recommendations, including regulatory changes, that should make FABs more cost effective. We recommend that performance should be addressed through the performance scheme, with FABs contributing where cost beneficial only. Network development should continue to be managed by the Network Manager, working with FABs as much as possible, but not where FABs may introduce delay or suboptimal outcomes due to revenue concerns.

This said, FABs are the best vehicle for airspace development where national/military interests are a barrier to progress in optimising the delivery of air navigation services. The study does not make any recommendations in respect of SESAR deployment, as industrial partnerships may be a more effective approach. This does not preclude FABs and the SESAR Deployment Manager working towards delivery per FAB, and there may be advantages to this where concepts are best deployed regionally.

Our recommendations are divided into the recommendations addressed to the European Commission ("EU-level recommendations") and recommendations addressed to FABs (which comprise both general and FAB-specific recommendations).

EU level recommendations

Recommendation No. 1: Reset the expectations of FABs

The longer term political goals of SES require fundamental changes in the configuration of operations to reduce the costs of service, which may only be achieved with strong political will at State-level. In the absence of such political will, industrial partnerships

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

have emerged in parallel with FABs and have provided an alternative solution to drive performance.

In these circumstances, FABs should not be seen as the sole path to rationalisation or as an end in themselves. FABs should be refocused on operational and technical cooperation that is cost-beneficial, and the governance structures and administrative overheads of FABs should be in proportion to the likely benefits. In respect of airspace design and route development, work in this area should also involve the input of the Network Manager to reduce any side effects caused by revenue considerations of FAB partners.

With a resetting of expectations, the likely outcome is that FABs become refocused on airspace and operational partnerships, where they may increase their impact on flight efficiency, building on the progress made in Free Route Airspace improvements. Retaining a focused but light FAB governance will be important to help unblock constraints set by military considerations, so the full engagement of the military in FAB governance is critical.

Whilst resetting the expectation on FABs, the EC should place an even stronger focus on the performance scheme framework, treating FABs as one vehicle among others to bolster performance. Robust economic regulation will be essential to drive cost-efficiency gains, which have so far not materialised through synergies at FAB level and in respect of which industrial partnership may constitute a more effective driver.

The preparatory phase of RP3 of the SES performance scheme constitutes a good opportunity to set the updated policy objectives and priorities regarding FABs, following the consultation of all relevant stakeholders.

Recommendation No. 2: Strengthen FAB business planning and transparency to foster progress

In resetting the expectations, FABs should move away from loose visions and become more concrete. In our view, revitalising FAB implementation requires more serious joint business planning, greater transparency and stronger accountability within FABs, as well as proper scrutiny by airspace users. Improved FAB business plans would give a better understanding of how a FAB will contribute to improved performance and help stakeholders to influence the types of FAB projects and their priorities.

The EC should hence pursue the following measures, including through regulatory changes as appropriate:

- Each FAB should be required to produce and regularly update a joint business plan, setting out the overall vision, strategy, deliverables and milestones of the FAB. The FAB business plans should be linked with the FAB Performance Plans, and subject to stakeholder consultation and EC review.
- FABs should be required to report each year on the progress made in the implementation of their business plans. This should be done through the development and publication of annual reports, including a review with users. This could be associated with a regular progress monitoring process of FABs at EU level.

Recommendation No. 3: Encourage industrial partnerships

The performance framework may be credited for ANSPs' development of industrial partnerships. These tend to have light governance in pursuit of specific goals, and focus on well-defined projects. Industrial partnerships should therefore be encouraged, with

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

assistance given by the Network Manager in spotting network opportunities for collaboration (e.g. rationalisation of CNS and other ancillary infrastructure and services). However, new partnerships should not become talking-shops, they should have a strict implementation focus.

In the framework of the SES II+ initiative, the European Commission has proposed to amend the substantive FAB legal provisions (art. 9a, EU Reg. 550/2004) so as to enable more flexibility within FAB structures and foster industrial partnerships. This course of action is supported by the conclusions of our study, and should be pursued by the European Commission.

Recommendation No. 4: Encourage inter-FAB cooperation (STR)

At the stakeholder workshop there was a reluctance by FAB stakeholders to consider a reconfiguration or amalgamation of FABs. It is understandable that the years spent developing the FAB governance structures would make ANSPs reluctant to change. However, our recommendation is for the Network Manager to look at related possible options for FABs at the periphery of Europe, in terms of future network efficiency. In spite of the lack of enthusiasm to combine FABs, such a study should at least inform on network opportunities and the findings could be taken forward through inter-FAB cooperation.

Further, by definition the 2-state FABs have limited potential to address airspace issues based on traffic flows. For the 2-state FABs there is arguably nothing achieved as a FAB that could not have been achieved through the normal process of bilateral arrangements between the ANSPs - as happened prior to FABs. Thus the FAB provides a structure, but the structure does not facilitate a regional approach, as 2-states do not make a region. Thus, whilst it adds complexity to decision making, the 2-state FABs need to extend their scope to be effective in meeting the original intent of FAB of driving a regional approach.

Recommendation No. 5: Promote pan-European extension of FABs

The SES policy encapsulates a pan-European dimension which is closely linked with the EU enlargement process, the European Common Aviation Area (ECAA) Agreement, and other comprehensive aviation agreements between the EU and Third Countries. The SES Framework Regulation expressly refers to the integration of EU partner countries in FABs.

The Commission has supported the objective of extending FABs to the ECAA countries located in the South-East Europe region. Our study supports this approach, including in the light of operational considerations. The significance of this part of the European airspace is that it is located in the axis of the major traffic flows in Europe, i.e. the so-called South-East traffic flow. The recent events and the various airspace blockages (e.g. Eastern Ukraine, Syria, Libya), have significantly changed the traffic patterns in South-Eastern Europe and have a high influence on the network situation in Europe.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

FAB level recommendations

Recommendations to FABs comprise both general and specific recommendations. We are summing up below the general recommendations which are relevant for all FABs. The complementary recommendations specific to each FAB can be found in chapter 5 of the report.

1. FABs should clarify their strategic priorities, and focus on maximising operational benefits to stakeholders. It is the role of the high-level governing body in each FAB to provide the needed strategic direction and to follow up on its realisation.
2. There are FAB-level synergies that remain untapped and, in the short to medium term, FABs should implement relevant best practices with a view to making the most of available opportunities.
3. The longer term political goals of SES are unlikely to be achieved by airspace changes alone – they require fundamental changes in the configuration of operations to reduce the costs of service, which may only be achieved with strong political will at State-level. In the absence of such political will, alternative approaches to drive improved performance such as the industrial partnerships have emerged. The existing alternatives should be nurtured, additional alternatives identified and facilitated so that FABs are not the sole path to rationalisation.
4. FAB governance should be calibrated to foster the delivery of key technical and operational benefits. As far as practicable, Member States should consider the possibility of delegating more FAB governance responsibilities to CAAs/NSAs, in an effort to shift the focus of FAB governance to technical cooperation.
5. There should be a possibility for governing structures within multi-State FABs to adopt decisions based on a simple majority of votes in cases where consensus cannot be reached. This possibility should apply at least in matters related to the implementation of FAB strategic plans and objectives which have been already approved by the FAB high-level governing body or bodies.
6. FAB implementation should not prevent smaller groups of States or ANSPs within FABs to establish enhanced cooperation arrangements, even if the project or activity concerned is not supported by all FAB members. The same flexibility is also needed in respect of inter-FAB industrial partnerships.
7. Each FAB (at ANSP level) should consider strengthening the management of their common activities through the establishment of a joint legal entity which is entrusted with project management responsibilities. This approach has generated positive results in the FABs where it has been implemented.
8. FABs should ensure that their activities are transparent and that relevant information on the FAB plans and results is made available, preferably online.
9. As FABs are vehicles for delivering benefits to airspace users they should ensure a strong customer engagement. This would help FABs refocus their activities on performance improvements and the related key operational priorities. FABs should ensure the regular consultation of airspace users, and aim to directly involve relevant airspace users in their governance structures in order to support FAB progress.
10. FABs should ensure the appropriate, continuous involvement of relevant military stakeholders in the FAB governance and implementation.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

11. FABs should consider strengthening the NSA level processes for performance planning, i.e. by agreeing on more ambitious NSA working arrangements focusing the development of the Performance plan on FAB level. The process for FAB performance planning should not be based on the sole aggregation of values and contributions produced at national level.

12. There is still a need for a more common approach by NSAs in oversight activities to reuse information and results; between the different national activities within the FAB and industrial partnerships. Today the information required by the different NSAs to perform oversight differs in both the type of content needed and the depth.

13. FABs should ensure the appropriate consultation of employee representatives on key FAB social issues and should ensure adequate consultative arrangements through a FAB level social dialogue mechanism.

14. Each FAB should establish and regularly update a business plan which will guide FAB entities in successfully implementing the joint activities. It is recommended that the FAB business plans should be maintained based on a FAB business plan template and guidance in order to better plan, manage and evaluate FAB performance.

15. A gate-to-gate approach recognises the inter-relationship between ANS services in terms of impact on performance of the total system (particularly delay, cost efficiency and safety). Furthermore, it removes the artificial allocation of cost between services which are delivered off a substantially common technology platform. To the extent that these problems may be addressed at the FAB level, such as extended arrivals management, it is recommended that FABs include TMA and aerodrome operations and infrastructure in their scope.

16. FABs should pursue cooperation with Third Countries with a view to optimising operational performance. FABs located in the South-East Europe region should be open to the gradual integration of ECAA Partner Countries in FABs, as foreseen in the context of the ECAA Agreement.

17. The expectation for FABs to optimise operations should be focused on airspace and route development. Work in this area should also involve the input of the Network Manager.

18. FABs should also seek opportunities to implement new SESAR concepts that improve terminal airspace flows, but this should not be limited to FABs and may be done on a bilateral basis within and between FABs.

19. FABs should focus on technical harmonisation and rationalisation of infrastructure and support services where cost-beneficial, and for ANSPs to explore alternative arrangements for this through outsourcing or industrial partnerships where the FAB is not seen as the appropriate vehicle.

20. Member States should consider engaging FABs as agents for the coordination of technical (and operational) roadmaps for SESAR deployment.

Table of Contents	Page
Executive Summary.....	3
1. Introduction.....	16
1.1 Background	16
1.2 Purpose of the Study	19
1.3 Methodology of the Study	20
1.4 Performed Tasks and Activities	22
2. Status and developments of FABs.....	26
2.1 Introductory remarks.....	26
2.2 Baltic FAB.....	27
2.3 BLUE MED FAB.....	41
2.4 DANUBE FAB.....	55
2.5 DK-SE FAB.....	72
2.6 FAB CE.....	82
2.7 FABEC.....	104
2.8 NEFAB.....	120
2.9 South West FAB	138
2.10 UK-Ireland FAB	152
3. Stakeholder views.....	164
3.1 Stakeholder survey	164
3.2 Analysis.....	165
3.3 Key findings.....	222
4. Benchmarking analysis	225
4.1 Benchmarking model	225
4.2 FAB geographic and operational scale	229
4.3 Scope of FAB activities.....	233
4.4 FAB business planning and development	235
4.5 Optimised operations and consolidation.....	240
4.6 Network integration and support to network level operations	248
4.7 Technical harmonisation and rationalisation.....	254
4.8 FAB governance and customer engagement	262

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

4.9	Effective management of the FAB social dimension	278
4.10	NSA level cooperation	284
4.11	Development of FAB common charging zone	297
4.12	FABs' contribution to SES policy areas	300
5.	Conclusions and recommendations.....	306
5.1	Conclusions	306
5.2	FABs' contribution to SES policy areas	310
5.3	Recommendations	311

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

1. Introduction

This report constitutes the Final Report of the Study on Functional Airspace Blocks (FABs), conducted upon request of the European Commission (DG MOVE) under Specific Contract MOVE E2/SER/2016-194/SI2.735467. The study was produced by a consortium of companies comprising Integra (lead), Ecorys, Winsland and Combitech.

This report contains the following elements:

- Chapter 1 provides an overview of the EU policy context and regulatory context relevant for FABs, recalls the study objectives and methodology, and explains the purpose of this Final Report.
- Chapter 2 describes the status and developments in each FAB, in terms of the institutional and regulatory dimension, technical and operational progress, and economic aspects.
- Chapter 3 outlines the outcome of the stakeholder consultation process conducted as part of the study, including an online stakeholder survey and interviews of stakeholders.
- Chapter 4 presents the results of the benchmarking assessment of FABs, and highlights the identified best practices.
- Chapter 5 sets out the overall conclusions of the study as well as recommendations addressed to the European Commission and FABs/Member States.

1.1 Background

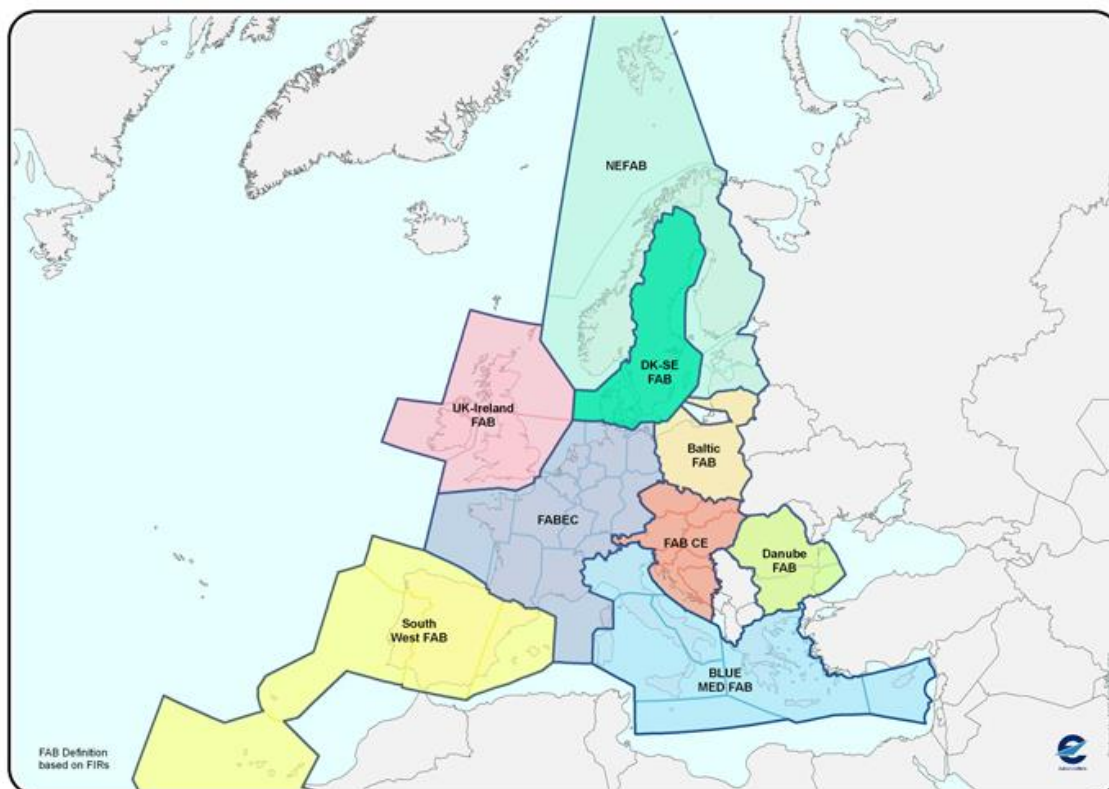
1.1.1 FABs: a key component of the SES policy

Functional airspace blocks (FABs) constitute one of the cornerstones of the Single European Sky legislation and policy. FABs are multi-State arrangements based on operational requirements and established regardless of State boundaries. FABs aim to reduce the fragmentation of the European ATM network and thus to improve performance.

The implementation of FABs was already enshrined in the first SES legislative package (2004). The FAB concept was subsequently reshaped, as part of the SES II legislative package (2009), with a focus on performance and service provision aspects. FABs are expected to be based on performance-driven and optimised air navigation services and related functions.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Figure 2 Map of functional airspace blocks



Pursuant to the SES legislation, Member States have the legal obligation to set up and implement FABs¹. Nine FABs have been established as pictured on the map above and listed in the table below.

Table 1 List of FABs

FAB	FAB Member States (in alphabetical order)
Baltic FAB	Lithuania, Poland
BLUE MED FAB	Cyprus, Greece, Italy, Malta
DANUBE FAB	Bulgaria, Romania
DK-SE FAB	Denmark, Sweden
FAB CE	Austria, Bosnia & Herzegovina ² , Croatia, Czech Republic, Hungary, Slovak Republic, Slovenia
FABEC	Belgium, France, Germany, Luxemburg, the Netherlands, Switzerland ³
NEFAB	Estonia, Finland, Latvia, and Norway ⁴
South West FAB	Portugal, Spain
UK-Ireland FAB	Ireland, United Kingdom

¹ EU Regulation 550/2004 set 4 December 2012 as the deadline for FAB establishment.

² Applies SES legislation pursuant to ECAA Agreement. BH is Member of FAB CE, but does not currently take part in all the FAB activities. For example, BH is not covered by the FAB Performance Plan for RP2.

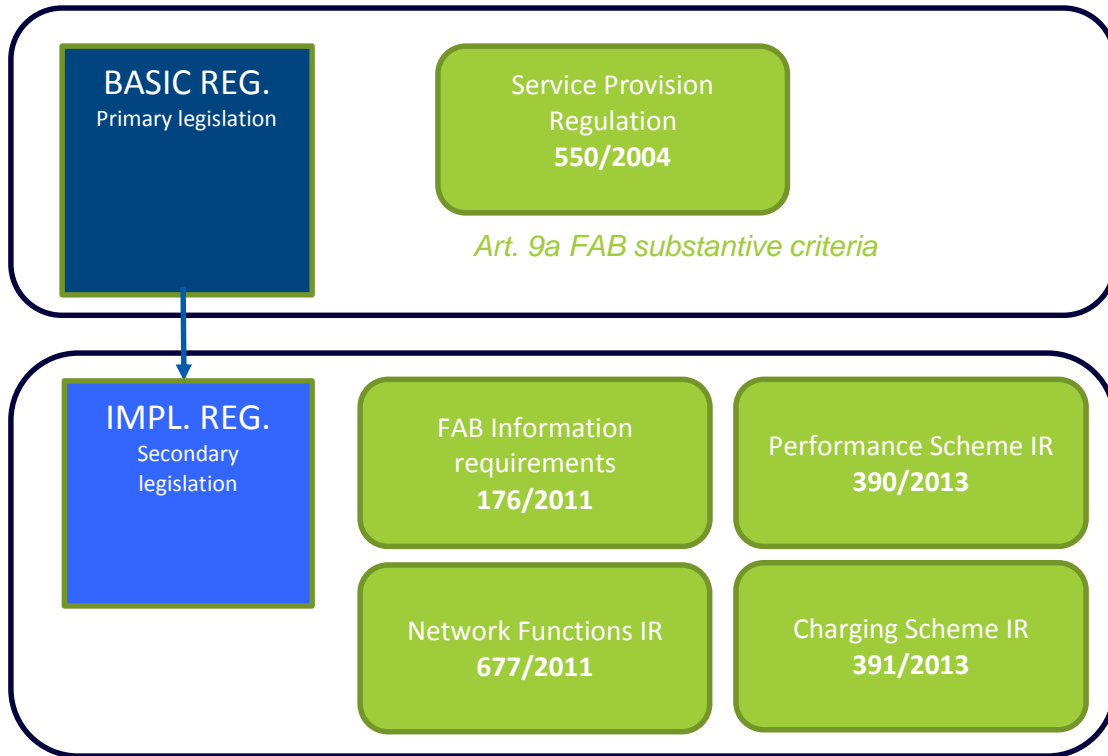
³ Applies SES legislation in accordance with bilateral agreement with EU.

⁴ Applies SES legislation by virtue of the EEA Agreement.

1.1.2 Regulatory framework

The key EU regulatory requirements pertaining to FABs are outlined in the figure below.

Figure 3 Key FAB regulatory requirements



The substantive legal provisions applicable to FABs are spelled out in article 9a of **EU Regulation 550/2004** (Service Provision Regulation), which requires each FAB to fulfil the following criteria:

- a) be supported by a safety case;
- b) enable optimum use of airspace, taking into account air traffic flows;
- c) ensure consistency with the European route network established in accordance with Article 6 of the Airspace Regulation;
- d) be justified by their overall added value, including optimal use of technical and human resources, on the basis of cost-benefit analyses;
- e) ensure a smooth and flexible transfer of responsibility for air traffic control between air traffic service units;
- f) ensure compatibility between the different airspace configurations;
- g) comply with conditions stemming from regional agreements concluded within ICAO;
- h) respect existing regional agreements, in particular those involving European third countries;
- i) facilitate consistency with EU-wide performance targets.

In order to accelerate the development of FABs, a regulatory deadline for FAB implementation was instituted as part of the SES II package: all Member States were obliged to establish FABs by 4 December 2012. The detailed information and consultation

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

requirements related to the establishment (and possible subsequent modifications) of FABs are spelled out in **Commission Regulation 176/2011**.

By and large, FABs constitute an important mechanism for the implementation of the Single Sky legislation by Member States in various domains, both at NSA and ANSP level.

In the SES performance scheme domain, FABs have become key actors in the second reference period (RP2). By virtue of **the Performance Scheme Regulation (Commission Implementing Regulation 390/2013)**, FABs are entrusted with significant responsibilities as regards the establishment, implementation and monitoring of ANS performance targets. Accordingly, all RP2 performance plans were developed and jointly adopted at FAB level, thus constituting a step change from the national performance planning approach which prevailed under RP1.

The Performance Scheme Regulation is implemented in conjunction with the **Charging Regulation (Commission Implementing Regulation 391/2013)** which expressly enables Member States to establish common charging zones at FAB level. In connection with the FAB performance plans, Member States within a FAB are required to adopt a financial incentive scheme applicable in the key performance area (KPA) of capacity and may also adopt a similar scheme in the environment KPA.

FABs also play an active role in respect of network functions. Pursuant to **Commission Regulation 677/2011**, Member States have the responsibility to ensure close cooperation and coordination between the FAB level and the Network Manager, such as in strategic planning and tactical daily flow and capacity management. Member States are also required to formulate consolidated views at FAB level in relation to the network functions, including as regards operational issues. The aforementioned requirement is exemplified by the fact that each FAB has to mandate one ANSP to represent it in the Network Management Board (management committee of the Network Manager).

In terms of possible future regulatory changes, it is important to note that the EC has proposed, as part of the SES II+ proposal, to redefine FABs around the concept of 'industrial partnerships'. This would allow more flexibility, including the possible participation of service providers in several FABs if justified by operational and performance aspects.

1.2 Purpose of the Study

The general objective of the FAB study is to assess the organisational, operational and technical progress of FABs following their creation in December 2012.

The specific objectives of the study are to:

- Review progress of FAB implementation.
- Gather views of operational stakeholders.
- Define measurable benchmarking criteria and identify best practices.
- Benchmark FABs against the applied criteria.
- Provide recommendations for the further development and implementation of FABs.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

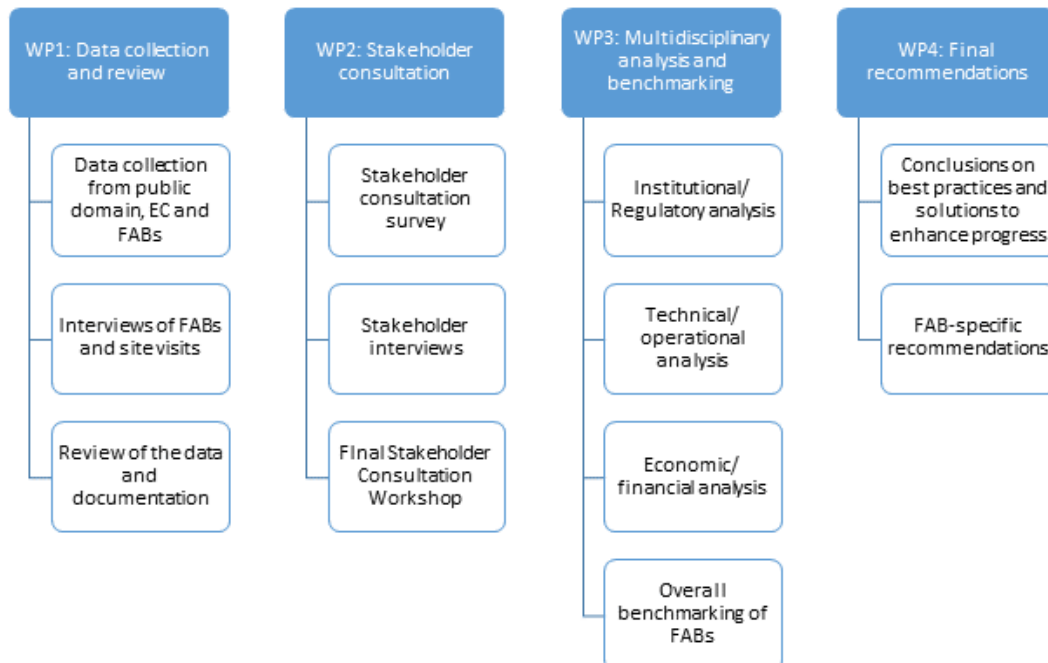
In accordance with our Terms of Reference and work plan, the purpose of this final report is as follows:

- to describe the existing situation of each FAB, based on the review and analysis of FAB data and documentation;
- to provide findings on the nature and scope of cooperation within each FAB regarding service provision, the level of technical harmonisation within each FAB, the institutional framework at various levels (States, NSA, and ANSPs) including governance, inter-FAB cooperation, implementation constraints;
- to present the outcome of the conducted online stakeholder survey concerning FAB implementation, as well as summarise findings deriving from a set of interviews with FAB stakeholders;
- to assess the progress achieved by each FAB against a set of benchmarking criteria covering the institutional/regulatory, operational/technical and economic/financial dimensions of FAB implementation;
- to propose recommendations for accelerating the development and implementation of the FABs.

1.3 Methodology of the Study

The work of the study team was structured around four Work Packages (WP), which are outlined in the chart below:

Figure 4 Work Packages



**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

We are summarising below, for the sake of clarity, the key components.

Work Package 1 covered the data collection and review tasks of the study, including:

- Identification and listing of relevant data sources.
- Collection of documents available online.
- Collection of complementary materials from the EC and relevant EU level actors.
- Collection of data and views directly from FABs (including data collection questionnaires, interviews with FAB representatives and site visits).

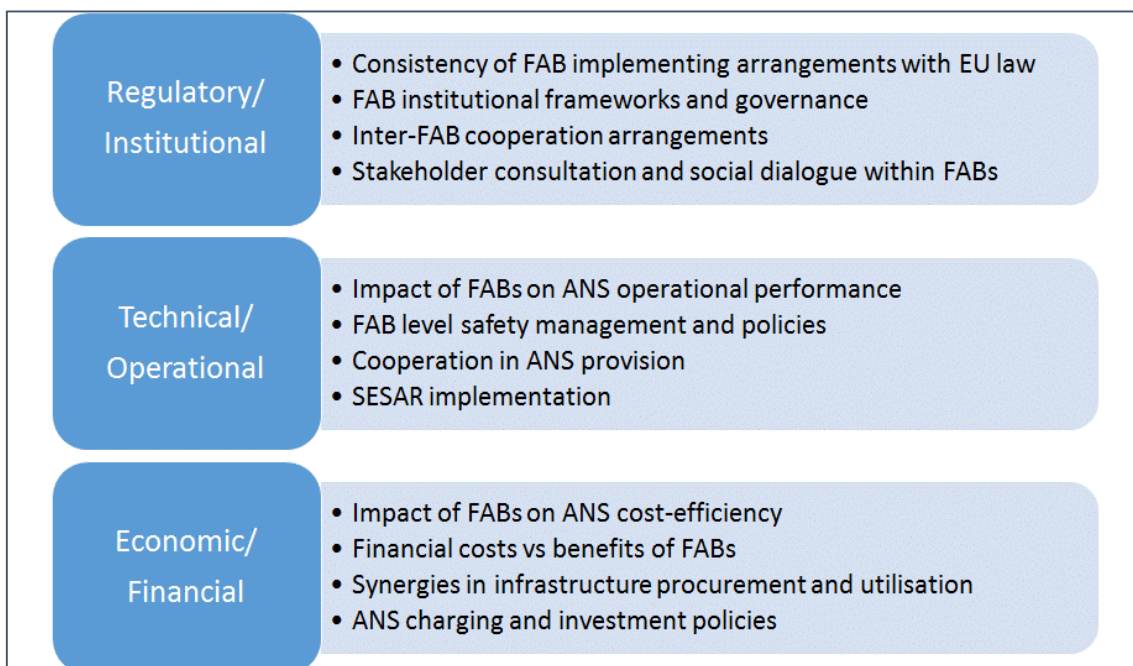
Work Package 2 encompassed the stakeholder consultation components of the study, including a comprehensive stakeholder survey.

Work Package 3 comprised the realisation of a thorough review and benchmarking assessment of existing FABs.

Work Package 4 consisted of the development of final recommendations for accelerating the development and implementation of FABs.

The study methodology is based on a multidisciplinary approach covering all the key aspects of FAB implementation highlighted in the figure below, namely the regulatory/institutional, technical/operational, and economic/financial dimensions.

Figure 5 Analytical dimensions of the FAB study



1.4 Performed Tasks and Activities

1.4.1 Collection and review of FAB data and materials

The first phase of the project comprised a number of essential data collection and review tasks.

The study team gathered FAB data and materials (WP1) from public sources (FAB and EU websites), from the European Commission (technical files submitted by Member States concerning FAB implementation) as well as directly from FABs.

For the purpose of data collection and interaction with the study team, the study team requested each FAB to designate ANSP and NSA level focal points.

The study team developed two data collection questionnaires (one for ANSPs and another for NSAs) which aimed to collect the most up-to-date factual data and information concerning the status and developments of each FAB. These data collection questionnaires were submitted to the FAB focal points in mid-September 2016, with 4 October 2016 as the deadline for responses.

As displayed in the table below, most FABs provided responses both to the ANSP and NSA level data collection questionnaires.

Table 2 Data collection questionnaire responses

<i>FAB</i>	<i>Response to ANSP questionnaire</i>	<i>Response to NSA questionnaire</i>
Baltic FAB	Response provided	Response provided
BLUE MED FAB	Response provided	No response
Danube FAB	Response provided	Response provided
DK-SE FAB	Response provided	Response provided
FAB CE	Response provided	Declined
FABEC	Response provided	Response provided
NEFAB	Response provided	Response provided
South-West FAB	Declined	Response provided
UK-Ireland FAB	Response provided	Response provided

Additional data and documentation were gathered through information requests to FAB focal points in the second phase of the study in October and November 2016.

Furthermore, the study team validated, complemented and clarified the received data through interviews with FAB representatives, the BOREALIS Alliance, the Network Manager, and the SESAR Deployment Manager. These interviews were conducted in the second phase of the study, and comprised:

- UK-IRL FAB – phone interview with FAB NSA focal point (CAA UK), 3 Nov 2016;
- SW FAB – phone interview with FAB NSA focal point (Spanish NSA), 8 Nov 2016;
- DANUBE FAB – phone interview with the NSAs of Bulgaria and Romania 16 Nov 2016;

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- NEFAB – phone interview with FAB ANSP level focal point, 17 Nov 2016;
- DK-SE FAB – meeting with the NSAs of Sweden and Denmark on 18 Nov 2016;
- DANUBE FAB – phone interview with the ANSP level focal points, 21 Nov 2016;
- FABEC – meeting with the FABEC ANSP level focal point, 23 Nov 2016;
- BLUE MED FAB, phone interview with FAB ANSP level focal point, 25 Nov 2016;
- FABCE – phone interview with FABCE focal point, 25 Nov 2016;
- Baltic FAB – meeting with BALTIC FAB focal point 29 Nov 2016;
- Network Manager – meeting with Director Network Manager and Head Network Strategy and Development on 23 Nov 2016;
- Borealis – meeting with Executive Director, 24 Nov 2016;
- SESAR Deployment Manager – phone interview, 25 Nov 2016.

1.4.2 Stakeholder consultation process

In the first phase of the study, the study team conducted a comprehensive stakeholder consultation process (WP2) with a view to understanding how the FABs meet the stakeholders’ needs and expectations, and what are the related key issues and challenges encountered by stakeholders.

Table 3 below outlines the various categories of stakeholders included in the consultation process. For the purpose of the study, ‘internal stakeholders’ are defined as the stakeholders legally responsible and accountable for the implementation of the FAB, while “other stakeholders” are the FAB customers (airspace users), the employee representatives (staff representative bodies) and cooperation partners (manufacturing industry, airports).

Table 3 Stakeholder matrix

	Stakeholder group	Entities
Internal stakeholders (FABs)	Member States	CAAs/NSAs, Ministries Military authorities
	Service providers	ANSPs (+ CANSO)
Other stakeholders	Airspace users	IATA, A4E, IACA, AEA, ELFAA, EBAA
	Staff representative bodies	ATCEUC, ETF, IFATCA, IFATSEA
	Manufacturing industry	ASD
	Airports	ACI

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

	Stakeholder group	Entities
EU	EU level actors	PRB, EASA, NM/NMB, NCP, ICB, NDOP, EGHD, SJU, SDM, EDA

The performed stakeholder consultation included two key components:

- The online stakeholder survey;
- The structured interviews of FAB stakeholders.

The online stakeholder survey for this study ran from 31 August to 30 September 2016.

A total of 423 stakeholders (categories identified in Table 2 above) were invited by email to take part in the survey. To reach as many respondents as possible, while also aiming to ensure sufficient representativeness of the relevant ANS stakeholder groups, the list of invitees comprised the following persons/entities⁵:

- Members and observers of the Single Sky Committee (SSC);
- Members of the NSA Coordination Platform (NCP);
- Members of the Network Management Board (NMB);
- Members of the Network Directors of Operations Group (NDOP);
- Members of the EGHD Group (professional staff representative bodies and CANSO);
- Airspace users (IATA, A4E, IACA, AEA, ELFAA, EBAA);
- Manufacturing industry (ASD);
- Airports (ACI).

Furthermore, the study team provided a hyperlink to enable stakeholders to share the survey directly with other interested parties that were not included in the original invitee list. Automated reminders were sent periodically to non-respondents; to those respondents who had started, but not finished the survey, an automated reminder was sent 24 hours later.

In total 56 complete responses and 16 partial survey responses were received from the targeted stakeholders. More details on the survey results (incl. distribution of respondents per stakeholder group) are provided in chapter 3.

In addition to the survey, a number of in-depth interviews of FAB stakeholders were performed as part of the consultation process. The list of conducted interviews is provided in chapter 3.1.

⁵ The stakeholders below were initially informed of the FAB study and related stakeholder consultation by the EC in July 2016.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

1.4.3 Final Workshop

The study team organised a final workshop for internal FAB stakeholders (ANSP and NSA representatives) which was held in Brussels on 29 November 2016. All the FABs were represented at the workshop.

The workshop provided a forum for discussing FAB best practices and exploring solutions and mechanisms for their practical implementation. The study team presented the key findings and draft conclusions of the study, including the results of the stakeholder survey conducted in the first phase of the study.

The workshop featured a high level of interactivity, including real-time polling and discussions with FAB representatives on the key elements of FAB implementation. The outcome of the workshop, including collected insights and views, has been taken into account in the development of this report.

2. Status and developments of FABs

This chapter outlines the findings of the study as regards the status and developments of each FAB, including in terms of organisational, operational and technical progress.

2.1 Introductory remarks

The findings presented in this chapter constitute the basis for the comparative benchmarking analysis presented in chapter 4.

The data and materials used for the purpose of the FAB status review contained in this chapter include:

- FAB responses to the ANSP level and NSA level data collection questionnaires of the study, as well as to additional information requests of the study team;
- Interviews with FAB representatives (both with ANSP and NSA representatives);
- FAB activity reports, strategy documents, business plans, operational deliverables, cost-benefit analyses;
- Agreements and other legal instruments relating to the FAB establishment and implementation;
- FAB performance plans for the RP2 period (2015-2019);
- FAB websites;
- Technical FAB materials and information submitted by the Member States to the EC;
- Consultation materials submitted in accordance with Commission Regulation 176/2011 when formally establishing the FAB.

The specific data sources used with regard to each FAB are indicated in the related sections.

2.2 Baltic FAB

2.2.1 General information

The **BALTIC FAB** comprises the Republic of Poland and the Republic of Lithuania. The FAB was formally established in July 2012. The overview of the BALTIC FAB constituents is provided below:

Table 4 Overview of the BALTIC FAB constituents

Member States	Air navigation service providers	National supervisory authorities
Poland	Polish Air Navigation Services Agency (PANSA)	Polish Civil Aviation Authority
Lithuania	Oro Navigacija	Lithuanian Civil Aviation Administration

Figure 6 Geographic scope of the BALTIC FAB



As shown on the attached map, the geographic scope of the BALTIC FAB comprises the Vilnius FIR and the Warszawa FIR.⁶

The two FIRs are surrounded by multiple other FIRs – thus, there are a large number of interfaces to deal with operationally. Furthermore, there are several long standing delegations of airspace (cross border areas) in place with neighbouring ANSP. The geographical area of the Baltic FAB is sub-optimal due to the Kaliningrad airspace

intersecting the two FIR.

Pursuant to the FAB Agreement, the remit of the FAB activities in terms of services encapsulates all air navigation services (ATS, CNS, MET, AIS), with the services being delivered in each FIR by the designated national ANSP.^{7 8}

Terminal ANS are not in the scope of the conducted FAB activities. Baltic FAB is evaluating the benefits of all common training activities and wherever possible, common trainings will be pursued. SAR activities, continue to be provided on a national basis with cooperation only, due to language barriers and different local specifics.

⁶ State-level Agreement, art. 4(1)

⁷ State-level Agreement, art. 13-17

⁸ BALTIC FAB Implementation Plan update, February 2016.

2.2.2 Institutional and legal arrangements

2.2.2.1 Legal basis

The BALTIC FAB implementation is governed by the following legal instruments:

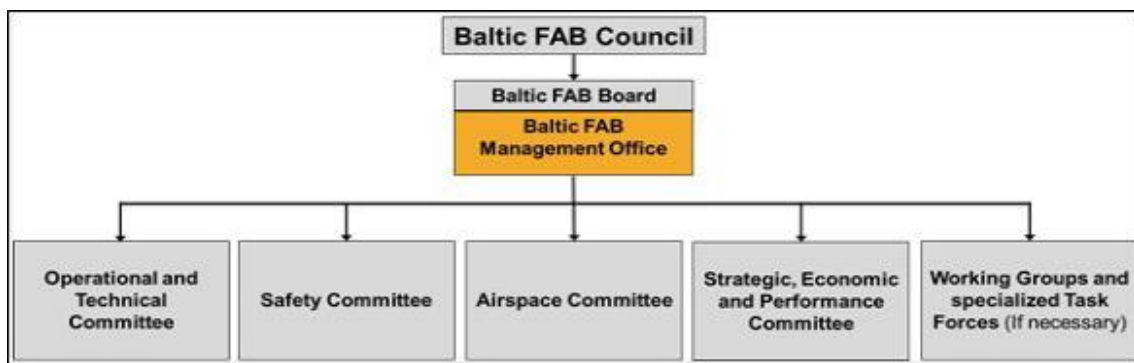
- State-level agreement: *Agreement on the Establishment of the Baltic Functional Airspace Block between the Republic of Poland and the Republic of Lithuania*, signed 17 July 2012
- NSA-level agreement: *NSA Cooperation Agreement between the Civil Aviation Administration of the Republic of Lithuania and the Civil Aviation Office of the Republic of Poland*, signed 6 September 2012
- ANSP-level agreement: *Cooperation Agreement of the BALTIC FAB Air Navigation Service Providers concluded between State Enterprise "Oro Navigacija" and Polish Air Navigation Services Agency*, signed 19 November 2012

2.2.2.2 Governance⁹

As depicted in the chart below, the BALTIC FAB governance structure consists of the following bodies:

- the Baltic FAB Council,
- the Baltic FAB Board,
- the Baltic FAB Management Office,
- Committees and Working Groups.

Figure 7 BALTIC FAB institutional structure



The BALTIC FAB Council is the highest decision-making body, and has overall responsibility for the FAB implementation and for its strategic development. Each State is represented at the Council by the following persons (or their duly authorised representatives):

- Minister responsible for civil aviation
- Minister of Defence
- Head of NSA
- CEO of designated ANSP.

⁹ Information sources: BALTIC FAB response to ANSP level data collection questionnaire; State-level Agreement; Baltic FAB website (section "Governance") (<http://www.balticfab.eu/?info=governance>)

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The BALTIC FAB Council meets at least two times per year, and decision-making is based on unanimity. Each State has one vote. There is no conciliation procedure. If there is no agreement reached, no decision is made.

The BALTIC FAB Board is in charge of the operational and technical decisions and orientations of the FAB, e.g. agreeing on a common design and policy for airspace, defining cooperation on FUA application, ensuring the implementation of a common overall SMS, approval of FAB performance plan etc. The Board is composed of the same representatives as the BALTIC FAB Council, and makes decisions based on the unanimity principle (each State having one vote).

The Committees and working groups supporting the Board comprise:

- the Airspace Committee;
- the Strategic, Economic and Performance Committee;
- the Safety Committee;
- the Operational and Technical Committee.

The BALTIC FAB Management Office (MO) supports the Baltic FAB Board and FAB related activities. The MO is funded through ANS charges and financial contributions of international organisations, financial institutions as well as other legal persons.

2.2.2.3 NSA cooperation¹⁰

An NSA Coordination Committee (NSA CC) has been set up pursuant to the NSA-level cooperation agreement signed in September 2012. The Committee is responsible for the *"management of the relationships between the NSAs in order to ensure harmonized supervision over the ANSPs in BALTIC FAB"*.

With regard to NSA cooperation in the field of ANS oversight, the following progress has been made so far:

- Audit schedules are exchanged on annual basis. There is a possibility for each NSA to take part as an observer in the other authority's audit activities as deemed necessary.
- The classification of findings has been harmonised and NSA procedures on ongoing oversight (incl. oversight of changes) have been exchanged.
- The lessons learnt and best practices are exchanged through meetings of the NSA CC, in particular as regards experience from ongoing oversight and certification processes.
- The development of a Common NSA Oversight Handbook is planned.
- The training requirements of NSA inspectors are harmonised, e.g. by the use of IANS courses (SAF/LEX/NSA-AUDIT).
- A pool of NSA experts was established in 2014. By virtue of the NSA Cooperation Agreement, each NSA is entitled to make use of the expertise of any listed expert

¹⁰ Information sources: Baltic FAB NSA level Agreement and BALTIC FAB response to NSA level data collection questionnaire

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

to support its supervisory activities, in a manner consistent with its national rules regulating the execution of such activities.

- FAB safety-related changes are subject to NSA Committee's review. There has been no such change yet.

The Lithuanian and Polish NSAs are jointly responsible for the development of the FAB Performance Plan, which is subject to the BALTIC FAB Board approval. ANSP investment plans as an integral part of the FAB performance plan are subject to this reviewing and approval procedure. The Baltic FAB Strategic, Economic and Performance Committee (SEPC) is responsible for monitoring actual performance and target achievement. SEPC reports to Baltic FAB Board (twice a year) and EC (annually).

The main medium term priority in terms of NSA cooperation is the development of a common NSA Oversight Handbook. The identified main challenge (due to financial constraints in particular) is the availability of NSA inspectors to take part in the audits conducted by the partner NSA. Overall, NSA resources are deemed sufficient for effectively managing the FAB's NSA dimension.

2.2.2.4 Customer engagement, stakeholder consultation and communication¹¹

The Baltic FAB's State-level and NSA agreements contain provisions regarding stakeholder consultation. An annual meeting is held with airspace users and other stakeholders, where users are consulted about FAB activities. Both trade unions representatives and airspace user representatives are invited to consultations to discuss the status of the FAB and its future plans. Participants have the opportunity to influence agendas.

Face to face meetings are held once per year, with a WebEx facility available on request. Additional ad hoc meetings may be convened out of cycle, on request of either the social partners or ANSPs. There is also the option to use written consultations if required.

Baltic FAB States also consult with airspace users and stakeholders on the Performance Plan/targets, terminal charges based on Commission Implementing Regulation No. 390/2013 and Commission Implementing Regulations No. 391/2013. Such consultation meetings are conducted by both Polish and Lithuanian parties and are usually held in May.

The BALTIC FAB website provides an introduction of the FAB background, governance and components. The information is mostly of general nature. The website also includes a set of FAB documents that can be downloaded – however, apart from the FAB legal instruments. these documents relate mostly to the time period of establishment of the FAB in 2012 and are connected with the initial FAB submission to the EC. There are no updates on the FAB activities available on the website.

¹¹ Information sources: BALTIC FAB response to ANSP level data collection questionnaire; Baltic FAB website: <http://www.balticfab.eu/?info=home>.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

2.2.2.5 Social dialogue

Social dialogue is included in the scope of cooperation of the BALTIC FAB ANSP Cooperation Agreement. The Agreement stipulates that the CEOs of the ANSPs shall be responsible for "*coordinating common ANSPs positions with respect to the matters of social dialogue activities and external communication*".¹²

Trade unions are invited to the annual FAB consultation meetings (described under the previous sub-section). Typically each meeting addresses a range of tactical and strategic items, with trade unions most interested in social aspects (employment conditions, pay...) and operational projects, and airspace users more focussed on business and investment plans. Additional ad hoc meetings may be convened out of cycle, on request of either the social partners or ANSPs.¹³

2.2.2.6 Inter-FAB cooperation and cooperation with Third countries¹⁴

The BALTIC FAB ANSPs are part of the:

- GATE ONE (GO) strategic alliance together with ANSPs from the DANUBE FAB and FAB CE. GATE One (GO) is a bottom up regional ANSP initiative established in 2013. The members of GO also include two ANSPs from third countries not member of a FAB, i.e. M-NAV (Macedonia) and SMATSA (Serbia);
- B4 Consortium, together with ANS CR (Czech Republic) and LPS SR (Slovakia), and linked parties from research (universities, research centres, consultancy) and industry (equipment manufacturers) community. The B4 Consortium is a member of ANSP Consortium A6+ on SESAR 2020 Programme content.

The Baltic FAB members have also been involved in exploring various initiatives with other ANSP, although no projects have materialised. The scope of discussions includes:

- Potential Data Link extension to Ukraine
- Potential FRA Extension to Ukraine and Belarus
- Participation in Gate One FRA Study (13 ANSPs).

¹² BALTIC FAB ANSP Cooperation Agreement, art. 4(2)(f) and Annex

¹³ BALTIC FAB response to ANSP level data collection questionnaire

¹⁴ Information source: LSSIP Report Year 2015 Poland, p. 34

2.2.3 Operational context and status

2.2.3.1 Overview of operational and technical elements

BALTIC FAB	
Geographic scope and traffic features	<ul style="list-style-type: none"> • Warsaw and Vilnius FIRs excluding those sectors delegated to Sweden and Estonia. • FAB has the Russian Federation airspace of Kaliningrad substantially dividing it. • The short border between the Warsaw and Vilnius FIRs and the proximity of Kaliningrad limits opportunities to optimise airspace or the route network at a FAB level. • Significant over flight traffic - 81% in case of Vilnius 60%, for Warsaw. The major flows are North-South from Czech Republic to Poland and East West from Germany to Poland.
Number of States	<ul style="list-style-type: none"> • Two state FAB - Poland and Lithuania.
Scope of FAB service provision	<ul style="list-style-type: none"> • En route ATS in the Warsaw and Vilnius FIRs. Two ANSP independently provide the CNS systems, AIS. The Polish ANSP also provides MET.
FAB Business/Implementation Plans	<ul style="list-style-type: none"> • FAB Airspace plans, Operational concept, Technology optimisation plans and CBA were produced in 2012 to meet the requirements of Article 3 of Commission Regulation (EU) N° 176/2011. • There are no publicly available updates of the 2012 documents. • The Performance Plans produced for the purposes of the Performance Regulation (EU) No 390/2013 (and its predecessors) are in fact two separate state performance plans not a FAB performance plan and certainly do not qualify as a business plan.
Airspace configuration / ATFM	<ul style="list-style-type: none"> • Flight efficiency already good¹⁵. • Initial FRA has been initiated consistent with ERNIP.

¹⁵ Baltic FAB Implementation Programme Progress Report, October 2014–November 2015

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

<p>Convergence of operational concepts and systems</p>	<ul style="list-style-type: none"> • Harmonisation of procedures, although the normal process of SLA updates between neighbouring FIR would achieve the same end. The FAB has possibly accelerated this. • Strategy of technical systems harmonisation as an enabler for Cross Border Service provision, dynamic sectorisation and Joint Contingency. • Key milestones are¹⁶; <ul style="list-style-type: none"> ○ 2018 - Implementation of the initial Baltic FAB ATM solution ○ 2020 – Contingency Service Provision ○ 2020 – Cross border Operations and Dynamic sectorisation • Operationally, the States are quite different with Poland having 87% of the combined en route traffic and a history of capacity issues. Comparatively, Lithuanian traffic is light and there are no delays.
<p>FAB integration for delivery of the new technology AND Rationalisation of systems and equipment</p>	<ul style="list-style-type: none"> • FAB common procurement strategy to optimise procurement outcomes. • Major procurement under this strategy is to enter iTEC. Once delivered, this provides a basis for technical alignment in terms of FDPS capability and common Controller Working Positions. • Both ANSPs will implement basic AMHS capabilities to comply with European ATM Master Plan (Level 3) requirements, at the same time.
<p>Rationalisation of support services</p>	<ul style="list-style-type: none"> • Very little achieved beyond exchange of information • Is a project for coordination of AIS but no intention to rationalise on a single system.

The BALTIC FAB operational highlights are:

- Free Route Airspace is being implemented, but not as a FAB as the two ANSPs plan to implement it at different times. FRA is driven by the ERNIP and the Pilot Common Project Reg (EU) 716/2014.

¹⁶ Baltic FAB - Towards Baltic FAB ATM System - presentation to InterFAB Workshop Operations, 2-3 May, Frankfurt/Langen, Germany.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- Joint procurement of common FDPS [iTEC] is planned and contracts signed, providing the technical basis for operational integration.
- There is a clear technical and operational roadmap.
- There is a clear strategy, at three levels: individual ANSP initiatives, FAB initiatives, Industrial Partnerships.

The study has also observed:

- Kaliningrad and it being a two State FAB are constraints: "The geographical area of the Baltic FAB is suboptimal in regard to airspace. It is difficult to understand how based upon the relative size, that the establishment of these 2-states as a stand-alone FAB is likely to provide optimal use of airspace, human and technical resources".¹⁷
- The FAB is responding to this limitation by:
 - Both ANSPs are in the FAB part of the B4 Consortium - set up to participate in the SESAR 2020 Research and Innovation Programme.
 - Also Lithuania expressed an intent to collaborate with neighbouring countries, especially with Ukraine and Belarus.
- The FAB is exploring options for working with other States and FABs - particularly through the Gate One arrangement
- The FAB has both articulated and, in the form of procuring a common technology platform, commenced implementation of a plan which delivers cross border operations, dynamic sectorisation and mutual contingency operations. Depending on the detail, this may represent a high level of ambition in operational convergence compared to other FABs.
- The FAB has entered the iTEC (Interoperability Through European Collaboration) alliance, which provides access to and the capacity to leverage expertise of other partners.
- The FAB is also recognised as bringing knowledge transfer benefits through informal exchange of information.

2.2.3.2 Detailed review

Airspace configuration / ATFM

Warsaw FIR lies within the national borders to the East, South and West, where it borders on respectively the Vilnius, Minsk, Lviv, Bratislava, Praha FIRs, and the German FIRs and UIRs. To the North it covers part of the Baltic Sea and has common boundaries with the Sweden and Kaliningrad FIRs. The air traffic service in two northern parts of the FIR over the Baltic Sea is delegated to Sweden. Vilnius FIR adjoins Riga FIR to the north,

¹⁷ "Comment Response Document" (CRD) - BALTIC FAB consultation process under Commission Regulation (EU) No. 176/2011

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Minsk FIR to the east and south, Kaliningrad FIR to the west, Warsaw FIR to the south-west and Sweden FIRs to the west.¹⁸

Despite the delegation of airspace, the FAB's borders are those of the States involved and do not take into account air traffic and are significantly compromised by the Kaliningrad airspace intersecting the two FIRs.

The bulk of traffic is overflights, 81% in case of Vilnius¹⁹ and 60% for Warsaw²⁰. Warsaw has significant international arrivals and departure traffic.

The traffic flow analysis within the Concept of Operations supports the view with traffic flow data that the establishment of a Polish-Lithuanian stand-alone FAB is a sub-optimal decision for European airspace management. Additionally, it would obviously be beneficial to airspace design and management if the Russian Federation airspace for Kaliningrad was included.²¹

The FAB states manage FUA at an individual ASM level - there is no concept of FAB level ASM or ATFCM. Free Route Airspace [FRA] is being implemented consistently with European ATM Master Plan (Level 3): AOM21 and OI-Steps: AOM0401, AOM-0402. However, the timeline is set on a state rather than FAB basis. In December 2015 Oro Navigacija implemented FRA in upper airspace between FL245 and FL660²². About 50% of planned benefits²³ have so far been achieved. PANSAs has a plan to implement FRA in 2019. Based on traffic flows between partner states, it seems that these two implementations are not strictly a FAB project even though the project is coordinated by the FAB.

Convergence of operational concepts and systems

Is dependent on achieving technical systems harmonisation as an enabler for Cross Border Service provision, dynamic sectorisation and Joint Contingency.

Operationally the states are quite different with Poland having 87% of the combined en-route traffic thus the potential operational gains available from the use of such strategies is limited.

Rationalisation of systems and equipment

In July 2016 the FAB partners signed contracts with Indra for the deployment of iTEC under the common procurement procedure. This system is essential for the deployment of a common FDPS to support integrated services across the Baltic FAB.

¹⁸ Baltic FAB submission in accordance with Article 9a.3 of Regulation (EC) No. 550/2004, PMO, version 2.0, 4 December 2012

¹⁹ Local Single Sky Implementation Report (LSSIP) LITHUANIA - 2015

²⁰ Local Single Sky Implementation Report (LSSIP) POLAND - 2015

²¹ "Comment Response Document" (CRD) - BALTIC FAB consultation process under Commission Regulation (EU) No. 176/2011

²² SUP 011/2015, "Implementation of Free Route Airspace in Vilnius FIR/UIR, http://www.ans.lt/media/cms_page_media/78/EY_Sup_A_2015_011_en.pdf, available on 1/12/2016

²³ Interview with Baltic FAB 29/11/16.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Both ANSPs will implement basic AMHS capabilities to comply with European ATM Master Plan (Level 3) requirements at the same time.²⁴

Performance scheme

- Safety: the FAB targets submitted for RP2 are consistent with European wide target.
- Environmental: the FAB targets submitted for RP2 are trend of ongoing improvement and for RP2 are consistent with European wide target
- Capacity: Lithuania has had excellent capacity performance. Poland had significant problems in RP1 and does not plan to meet the planned RP2 capacity targets until the end of RP2. However, the Baltic FAB capacity targets are consistent with the respective FAB reference values.
- Cost: Poland's en route direct costs represent 87% of the total en route costs for the Baltic FAB over RP2 thus the FAB target reflects Poland's dominant contribution. By 2019 the Baltic FAB unit cost will be 45.5% lower than the EU average.²⁵

2.2.4 Assessment of economic aspects

2.2.4.1 FAB CBA analysis

The Baltic FAB submitted its CBA in 2012. Benefits were mainly expected in the following areas²⁶:

Savings:

- Technical benefits include the capital and operating cost savings arising from technical opportunities;
- Operational benefits include indirect benefits such as ATCO cost savings, and other capital and operating cost savings from operational opportunities;
- Financial savings include indirect financial benefits from the MET service provision opportunity and from sharing best practices;
- Safety savings include capital and operating cost reductions arising from safety opportunities;
- Delay savings and flight efficiency benefits include direct benefits to users arising from operational opportunities.

Impacts on performance:

- Capacity: the FAB opportunities have no impact on en-route ATFM delay, as delay is expected to reach optimum levels from 2013. Any capacity improvements from FAB opportunities translate into cost savings from better utilisation of ATCOs;

²⁴ European ATM Master Plan Level 3 Report - Implementation View - 2015

²⁵ PRB Assessment of RP2 FAB Revised Performance Targets DANUBE FAB Version 3.1 - 16/10/2015

²⁶ Baltic FAB Submission, Chapter 2 Baltic FAB Benefits Statement, 2012.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- Financial cost-effectiveness: working together in FAB cooperation can bring improvements in cost-effectiveness of around 5% up to 2030. This represents a cost saving of €19 per flight hour in 2020;
- Economic cost-effectiveness: since there are no delay benefits from the FAB, and horizontal flight efficiency benefits are negligible, the economic cost effectiveness improvement is the same as the financial cost-effectiveness improvement;
- En-route unit rate: the FAB opportunities bring improvements to the average en-route unit rate of up to 2.5% by 2015;
- Vertical flight efficiency: the FAB opportunities improve vertical flight efficiency, leading to fuel cost savings of around €0.25m in 2020 and €0.5m in 2030, direct to airspace users.

The CBA reported an expected NPV of €129.4m in 2030. The benefits are largely cost savings to the ANSPs, through efficiencies from working together which can be passed through as unit rate reductions. There are also benefits from fuel savings and delay reduction, which accrue directly to airspace users. Baltic FAB indicated that the benefits for Baltic FAB are limited due to their short common border, limited shared traffic and disparate country sizes. The CBA includes scenarios of inter-FAB cooperation, which would bring three categories of benefits:

- Savings in ATM/CNS costs for the ANSPs, through a reduced requirement for staffing, through rationalisation or better planning of infrastructure, through economies of scale, and sharing of resources;
- Flight efficiency benefits through better flight profiles and direct routing, leading to savings in fuel costs for airspace users and reduced km flown, with consequent reductions in CO2 emissions;
- Reduced ATFM delay for airspace users.

At the time of writing the CBA, Baltic FAB had not further explored the potential of inter-FAB cooperation.

As mentioned in Section 2.1.3, FRA has been initiated consistent with ERNIP, but not as a FAB. The two ANSP plan to implement at different times. Other initiated elements under Section 2.1.3 may lead to economic benefits.

In response to the ANSP level data collection questionnaire, complemented with an interview, Baltic FAB indicates the following on flight efficiency benefits: the progress on the establishment of FRA within Baltic FAB and the convergence of ATM systems in the Baltic FAB ACCs and Cross Border Service Provision with Joint Contingency Provision. Benefits are being achieved, however not as a result of the Baltic FAB initiatives per se: both ANSPs strive to deliver efficient traffic management as a daily routine and also as an effect of earlier projects. Baltic FAB foresees that the latter benefit will also lead to lower costs in the system maintenance area. For Lithuania about 50% of the FRA benefits have been achieved. FRA in Poland is scheduled for 2019. It is not strictly a FAB project, because of the traffic flows between the states. This project is however coordinated with

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

the FAB, with there being more potential for PANSA on its own rather than through the FAB.

Regarding delay reduction benefits, Baltic FAB reports that there have been benefits, but not as a result of the FAB: Delay reduction in EPWA (as EYVL is not reporting any delays) was the result of the optimization in working technologies, ATM system upgrade together with introduction of the vertical sectors split. This was achieved outside of the Baltic FAB initiatives.

As for safety benefits, enhancement of the safety of ANS is foreseen through common NSA activities. To stimulate cooperation, the NSA Coordination Committee (NSA CC) has been set up. The NSA CC manages the relationship between the NSAs in order to ensure harmonised supervision over the ANSPs in Baltic FAB. Harmonisation of provision rules will be performed within agreed framework of cooperation, and only if assessment proves benefits from harmonisation. Most actions undertaken so far seem not to have led to any financial benefits yet, although an agreement has been reached to jointly participate in the training courses organised in-house. This could render some financial savings.

Other benefits include closer cooperation between PANSA and Oro Navigacija, staff assigned to work on the FAB implementation and management; ANSPs adopting a FAB 'mindset', which involves considering potential cooperation with each other before making major decisions. Next to that, CNS/ATM planning is now coordinated and any procurement will be done with the FAB in mind.

Looking back on the CBA, Baltic FAB has indicated that it would delete the Optimisation of Search and Rescue Services due to lack of substantial benefits and threat of lowering service level due to language barrier in common SARCC. Furthermore, the Meteo service optimisation would have been evaluated differently – due to different models of MET service assurance (designation, open competition) all having advantages and disadvantages and they are more of political/social nature than a pure economical decision.

2.2.4.2 Performance in cost-efficiency KPA (actual performance RP 1)

The performance in terms of cost efficiency during RP1 is provided in the following table. Cost efficiency was only reported on individual ANSP level during RP1. Data for 2015 (first year RP2) are not yet available. Values in red indicate the actual rate was higher than the target.

	2012		2013		2014	
	Target	Actual	Target	Actual	Target	Actual
Lithuania	€ 47.00	€ 45.84	€ 45.37	€ 45.59	€ 44.23	€ 41.49
Poland	€ 33.68	€ 31.81	€ 33.56	€ 30.20	€ 31.75	€ 34.99

Source: PRB Annual Monitoring Reports; Ecorys

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

2.2.4.3 Unit costs RP 2, unit rates and charging zones

Baltic FAB has 2 en route charging zones: Lithuania and Poland. These are the same as the terminal charging zones.²⁷

The following determined unit costs for RP 2 apply on FAB level, based on the FAB performance plan.

	2015	2016	2017	2018	2019
TSUs	4.853.768	5.052.601	5.223.877	5.402.672	5.598.548
Real en route UCs/DUCs (in €₂₀₁₂ prices)	35,64	34,69	33,97	32,88	31,75
Trend in real en route UCs/DUCs (in €₂₀₁₂ prices) %n/n-1	-3,70%	-2,67%	-2,07%	-3,21%	-3,44%
Real en route UCs/DUCs (in €₂₀₀₉ prices)	31,34	30,50	29,87	28,91	27,92
Trend in real en route UCs/DUCs (in €₂₀₀₉ prices) %n/n-1	-3,71%	-2,69%	-2,70%	-3,20%	-3,44%

Source: Baltic FAB RP 2 Performance Plan

The unit rates of en route charges applicable to December flights (in €, based on November 2016 exchange rates) for the FAB member states are as follows:

Poland: 33.22

Lithuania: 44.99

In response to the ANSP level data collection questionnaire, the Baltic FAB has mentioned the obligation to consider common charging zones, but that the challenges for Baltic FAB in this regard are no different than the challenges for other FABs:

- Different cost level;
- Different level of SU and resulting different unit rate;
- Variable unit rate with changing exchange rate to EUR in Poland vs stable Lithuania because of the EUR as a national currency.

2.2.4.4 Resource-efficiency measures in core services and support services

In our ANSP level data collection questionnaire, the study team asked to which extent resource efficiency measures have been undertaken in the frame of Baltic FAB. Some of

²⁷ Baltic FAB RP2 Performance Plan

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

the measures undertaken are provided in 2.2.3. above. In response to the questionnaire, the Baltic FAB reported the following resource-efficiency measures:

- Joint procurement; synchronised life cycles of technical ATM systems; harmonised ATM systems and tools: through joint procurement of the ATM system. This is expected to have a medium impact on the capacity and cost-efficiency KPAs.
- Coordination of ANSPs' investment plans: through common CNS strategy and roadmap. This is expected to have a low impact on the safety KPA and a medium impact on the cost-efficiency KPA.

2.2.4.5 Conclusions on economic aspects of the FAB

The BALTIC FAB foresaw large economic benefits in the CBA. These have not materialised to full extent. However, judging from the implemented operational and technical projects, some benefits have been realised. It has not been possible to assess the costs and benefits in the light of reports published by the PRB and NM, as those reports provide no substantial basis on which this could be conducted.

The BALTIC FAB has incurred administrative costs to set up and run the FAB, but has not reported on these costs and these costs can therefore not be assessed.

In terms of technical harmonisation and rationalisation, the BALTIC FAB has implemented Harmonised Systems and Synchronised Life Cycles.

BALTIC FAB has initiated FRA consistent with ERNIP, but not as a FAB. It has not become clear to the study team if the benefits of FRA can be attributed to the FAB initiative. FRA could have happened regardless of the FAB initiative.

2.3 BLUE MED FAB

2.3.1 General information

The **BLUE MED FAB** is composed of four EU Member states: Cyprus, Greece, Italy and Malta. In addition, three non-EU countries are participating as Associated Members (Albania, Egypt and Tunisia) and two as observers (Lebanon and Jordan).

The BLUE MED Functional Airspace Block was established with the signing of the State-level Agreement on 12 October 2012²⁸. The data available indicates that the BLUE MED FAB State-level Agreement has been duly ratified by all the four European Member States composing the FAB and entered into force on the 22nd August 2014²⁹.

We are presenting below the overview of the constituents of the BLUE MED FAB:

Table 5 BLUE MED FAB overview

Member States	Air navigation service providers	National supervisory authorities
Cyprus	DCAC Cyprus	National Supervisory Authority for Air Navigation Services of the Republic of Cyprus
Greece	HANSP	Hellenic Air Navigation National Supervisory Authority
Italy	ENAV	Ente Nazionale Per l'Aviazione Civile (ENAC)
Malta	MATS	Civil Aviation Directorate of Malta

Based on the available data, the scope of the BLUE MED FAB agreement covers ATS, CNS, MET and AIS.³⁰ By agreement with ENAV (the Italian Air Traffic Services Provider), MATS also provides en-route services to all aircraft in a portion of the Rome FIR. This is the only delegation in place.

The BLUE MED FAB is impacted by the current challenging geopolitical and economic context in the covered region.

²⁸ <http://www.blueded.aero/index.php>

²⁹ Newsletter BLUE MED - n°6 - July 2015

³⁰ BLUE MED FAB State level Agreement and BLUE MED response to ANSP level data collection questionnaire

2.3.2 Institutional and legal arrangements

2.3.2.1 Legal basis

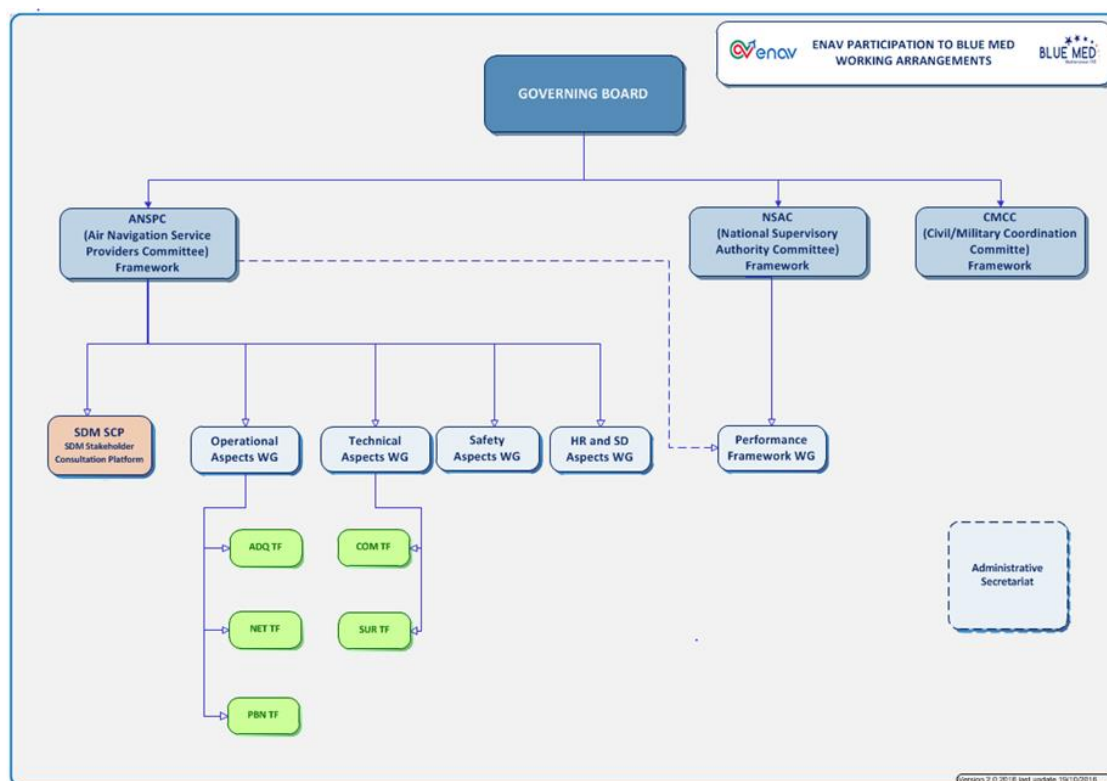
At the time of production of this report, the study team was not in a position to fully review the legal basis regarding the BLUE MED FAB, as there are no published electronic versions of the ANSP and NSA level Agreements:

- BLUE MED FAB State-level Agreement, Released Issue, Version 2.0, 28/05/2012;
- BLUE MED FAB NSA Level Agreement (not available to study team);
- BLUE MED FAB ANSP Level Agreement (not available to study team).

2.3.2.2 Governance³¹

The BLUE MED Governing Board is the joint decision-making body established for the purposes of the implementation, operation and further development of the FAB, in accordance with Article 19 of the State-level Agreement (SLA). Four civilian members and four military representatives from each Member State of the FAB make up the Governing Board. To assist the Board five other bodies are also in place, as depicted below.

Figure 8 Governance structure within BLUE MED



³¹ Information sources: BLUE MED FAB State level Agreement; BLUE MED FAB website; PPT: Demonstration of Compliance for the BLUE MED FAB establishment (<http://www.bluemed.aero/public/documenti/Item%2003%20BLUE%20MED%20FAB%20State%20Level%20Agreement.pdf>); PPT: BLUE MED FAB Implementation Programme, February 2014, (http://www.icao.int/RO_MID/Documents/2014/PBN%20Workshop-Tunis/BLUE%20MED_PBN-Tunisi%20v1.pdf)

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The following BLUE MED Committees have been established for the purpose of assisting the Governing Board in their respective competence domains:

- Civil/Military Coordination Committee (CMCC);
- National Supervisory Authorities Committee (NSAC); and
- Air Navigation Service Providers Committee (ANSPC)

The National Supervisory Authorities Committee (NSAC) was established under Article 22 of the SLA and is composed of one representative from each NSA of the BLUE MED FAB. It has competence in matters provided by the relevant SES legislation and in any additional tasks entrusted by the Governing Board.

The Air Navigation Services Providers Committee (ANSPC) was established under Article 22 of the SLA and is composed of one representative of each ANSP covered in the written agreement on joint designation done pursuant to Article 10 of the SLA. The ANSPC has competence in matters related to the relevant SES legislation and additional tasks entrusted to it by the Governing Board.

The Civil Military Coordination Committee was established under Article 22 of the SLA and has competence relating to civil-military coordination and in the application of the flexible use of airspace. It is composed of two representatives (one military and one civilian) from each BLUE MED Member State.

The Implementation Programme Focal Point Group (IPFPG) was established by the Governing Board and is made up of one Focal Point designated by each BLUE MED Member State. The Group's task is to continually oversee the progress achieved in the implementation of the activities and projects set out in the FAB Implementation Programme. The IPFPG reports to the Governing Board and keeps it informed, thus permitting the latter to give the necessary directions for the timely achievement of the Implementation Programme.

The Administrative Secretariat was established under Article 21 of the SLA in order to assist the Governing Board in administrative matters. It acts as the coordinating body for day-to-day administrative work also providing support to the abovementioned Committees, as well as ad hoc Task Forces and Working Groups. The Administrative Secretariat is composed of one representative from each BLUE MED Member State.

2.3.2.3 NSA cooperation

According to the BLUE MED State-level Agreement, each NSA has the responsibility for the oversight of the ANSP(s) that it has certified. The NSA Committee consults with the ANSP Committee and Civil-Military Coordination Group and reports to the Governing Board on service provision, performance, civil/military cooperation and FUA.

In addition, the National Supervisory Authorities Committee (NSAC)³² can express its opinion and/or advice to the BLUE MED FAB Governing Board on any issue falling within the remit of its responsibilities and that is brought to its attention. The NSAC is required

³² BLUE MED FAB NSA level Agreement presentation, slide 8, art. 10

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

to engage in the appropriate consultation with the ANSPC (ANSP Committee) so as to ensure that issues affecting both stakeholders are addressed in the spirit of cooperation and consensus

The principles and areas of NSA cooperation within the BLUE MED FAB are³³:

- Supervision of ATM/ANS in the airspace of the BLUE MED FAB;
- Supervision of ANSPs in the case of ANS provision in cross-border airspace;
- Safety related changes which apply to the airspace of two or more BLUE MED FAB Member States;
- Competence/licensing of ATM/ANS personnel;
- Preparation of the BLUE MED FAB Performance Plan;
- Harmonisation of oversight procedures and methodologies;
- Support to BLUE MED FAB MS with regard to harmonisation of substantive national rules and procedures relevant to the BLUE MED FAB.

As regards responsibility for supervisory tasks in cross-border situations³⁴:

- The certifying NSA retains the basic responsibility;
- The local NSA has the right to participate in oversight tasks, receive results and remedial actions, comment on results;
- The local NSA has the right to request the certifying NSA to conduct ad-hoc supervisory tasks
- The local NSA has the right to notify the certifying NSA of all rules and procedures (including changes) to be applied by the ANSP providing such services
- The local NSA has the right to request the certifying NSA to provide relevant information on the application of notified rules and procedures

The BLUE MED FAB NSAs are required to share information on the introduction of changes to existing, or new, functional systems, affecting BLUE MED FAB operations and, in particular, the arguments supporting the safe implementation of these changes. The NSAC shall use the results of the national safety monitoring activities in order to determine the achieved BLUE MED FAB aggregated safety levels as required by the relevant SES legislation.

The BLUE MED FAB Implementation Programme³⁵ refers to the creation of a BLUE MED FAB NSA Pool of Experts, harmonisation of audit processes, notification and acceptance of FAB-wide and/or Cross-border services, FAB Performance Plan monitoring and harmonisation of regulatory items. This document constitutes the planned Implementation programme, but there was no evidence provided to the study team that any of the abovementioned actions have actually been implemented.

³³ BLUE MED FAB NSA level Agreement presentation, slide 5, art. 3

³⁴ BLUE MED FAB NSA level Agreement presentation, slide 6, art. 5

³⁵ BLUE MED FAB Implementation Programme, Version 2.1. 9/04/2015

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

2.3.2.4 **Customer engagement, stakeholder consultation and communication**

The BLUE MED FAB has a formalised consultation mechanism of airspace users and other stakeholders in relation to the Performance Scheme related aspects.³⁶

The first BLUE MED Customer Care meeting was held in April 2016 at Rome Fiumicino Airport, allowing both the BLUE MED ANSPs to share their future plans for improving the overall efficiency of FAB operations, and the airspace user representatives to express their needs and expectations for Summer 2016 and beyond. The topics of the discussion ranged from a brief history of the FAB (its mission, governance and scope) to the status of the Implementation Programme, through the ATFCM procedures for Summer 2016 and the BLUE MED FAB Flight Efficiency Plan. With regard to this, a brand new mailbox was presented (flightefficiencyteam@bluemed.aero), with the aim of improving communications between airspace users and the BLUE MED FAB (or one/more of the ANSP/NSA members)³⁷.

The BLUE MED FAB website provides a comprehensive overview of the FAB structure and key activities. News updates and newsletters are regularly posted on the website. However, there are no FAB deliverables (legal and technical documentation) published on the website.³⁸

2.3.2.5 **Social dialogue**

The framework for the Social Dialogue within BLUE MED has been set out in the Joint Declaration and Terms of Reference signed by the ANSPs and the International Staff and Professional Associations in October 2011³⁹.

Even though there is a defined mechanism for social dialogue within the BLUE MED FAB, there is no available information or evidence that would indicate that this process has been effectively implemented.

2.3.2.6 **Inter-FAB cooperation and cooperation with Third countries**

The BLUE MED FAB has cooperation agreements with the ANSPs and national authorities of FAB CE, and another agreement at ANSP level with the DANUBE FAB.^{40 41}

The BLUE MED FAB and DANUBE FAB have exchanged a letter on inter-FAB cooperation with a view to sharing information on their respective implementation plans and projects so as to allow for identification and establishment of joint activities that would further enhance cooperation on the field of ATM/ANS and to improve the performances of the two FABs.⁴²

³⁶ <http://www.bluemed.aero/index.php>

³⁷ <http://www.bluemed.aero/nodo.php?id=62&idn=131>; BLUE MED response to ANSP level data collection questionnaire

³⁸ <http://www.bluemed.aero/index.php>

³⁹ <http://www.bluemed.aero/nodo.php?id=252>

⁴⁰ <http://www.bluemed.aero/nodo.php?id=114&idn=113>

⁴¹ http://www.bluemed.aero/public/report/BLUE_MED_Newsletter_issue_5.pdf

⁴² BLUE MED FAB response to ANSP level data collection questionnaire

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

With regard to third countries, three non-EU countries are participating as Associated Members in the BLUE MED FAB (Albania, Egypt and Tunisia), whilst two countries have observer status (Lebanon and Jordan). BLUE MED has also signed a cooperation agreement with the Civil Aviation Authority of Israel (CAAI), allowing the CAAI to identify, together with BLUE MED, the procedures and areas of cooperation that are of interest to Israel.

BLUE MED has also received an application from Libya, which will have to be examined once the security situation in Libya allows it, as well as from FYROM and Egypt, which are being examined favourably.

All of the BLUE MED States have regional cooperation ensured through various signed bilateral Agreements⁴³.

2.3.3 Operational context and status

2.3.3.1 Overview of operational and technical elements

BLUE MED FAB	
Geographic scope and traffic features	<ul style="list-style-type: none"> • BLUE MED is one of the larger FABs and has airspace over the high seas. • The nature of traffic varies considerably between FAB members. Over flights as a percentage of all traffic are; Malta 63%, Cyprus 80%, Greece 48%, Italy 33%. The ratio of over-flight traffic in Italy and Greece is particularly low relative to most other FAB in Central and Eastern Europe.
Number of States	<ul style="list-style-type: none"> • Four members [Cyprus, Greece, Malta, Italy], Italy being the most substantial in terms of size, location and financial and people resources.
Scope of FAB service provision	<ul style="list-style-type: none"> • The FAB scope of operations includes en-route ATS in all states. AIS and MET are designated as an ANSP in some member States but not others. SAR is outside of scope. The FAB does not include TMA or Aerodrome - beyond where the procedure or technology has impact for multiple services such as WAM or PBN or the limited requirements of Performance Scheme target setting and reporting.

⁴³ <http://www.eurocontrol.int/articles/Issip>

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

<p>FAB Business/Implementation Plans</p>	<ul style="list-style-type: none"> The only publicly available FAB business plans are those developed in 2012 as FAB submission to the EC. These are lacking in detail and breadth, are dated and clearly don't serve to document the future path of the FAB operations, technical concept or services in what is meant to be the implementation phase.
<p>Airspace configuration / ATFM</p>	<ul style="list-style-type: none"> There is no clear operational concept beyond implementation of FRA which is an objective required under Commission Regulation (EU) No 716/2014 as part of the Pilot Common Project.
<p>Convergence of operational concepts and systems</p>	<ul style="list-style-type: none"> Initial implementation of FRA meeting requirements of ATM Functionality 3 of Regulation (EU) 716/2014 [see above]. Beyond this there have been no FAB implementation projects. Rather there have been individual ANSP projects where the FAB members (or some FAB members) cooperate. There is no detailed plan to pursue any form of operational integration in the form of cross border sectors, dynamic sectorisation, mutual contingency etc.
<p>FAB integration for delivery of the new technology AND Rationalisation of systems and equipment</p>	<ul style="list-style-type: none"> There is no FAB technology concept with a clear path to implementation based on a uniform FAB (as opposed to state) approach and mandate. The member states have different FDPS. There have been recent procurements which might have presented an opportunity to adopt a common FAB technology platform - however, individual members are making procurement decisions in isolation.
<p>Rationalisation of support services</p>	<ul style="list-style-type: none"> No definitive initiatives for rationalisation of ATC or ATSEP Training, AIS publication, SAR, MET

The BLUE MED FAB operational highlights are:

- Initial implementation of FRA meeting requirements of ATM Functionality 3 of Regulation (EU) 716/2014.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The study has also observed:

- LSSIP reporting⁴⁴ provides evidence, that there is no long term detailed and agreed operational concept and technology roadmap defined to deliver against the SES goals. Rather what members of BLUE MED are reporting as FAB initiatives are State-level actions - normally responding to local needs or compliance with the European ATM Master Plan (Level 3).
- There are significant differences between member states in their economic capability and staffing. Thus the relative capacity of Greece, Malta and Cyprus to contribute to BLUE MED differ considerably. Further the interests of the states in terms of airspace and traffic characteristics are markedly different - thus their priorities will be different.
- No rationalisation of service provision or support services is planned.
- Progress with implementation appears limited. Based on publicly available information, beyond FRA, which is arguably a PCP rather than FAB driven initiative, the FAB has not achieved anything that contributes to enhanced capacity, efficiency, safety and lower costs of air navigation services, through cooperation and integration across borders. In this FAB, the initiatives taken to address capacity etc. are at national level rather than as part of a FAB plan.
- The FAB members did successfully provide support to respond to Greek capacity issues in 2016.
- Potentially ANSPs TEN-T IDP Implementation Project and BLUEGNSS (Promoting EGNSS Operational Adoption in BLUE MED) may represent best practice but it is difficult to see the involvement with industry in the latter case being a significant for the FAB, it seems more likely to add value for ENAV.
- The diversity between ANSP is more significant in this FAB than others. They may be geographically aligned but socially and economically they are less homogeneous than other FABs
- There is a difference in air traffic - two have a high level of over flight, two have a high level of international arrivals and departures. Thus their priorities differ.

2.3.3.2 Detailed review

Airspace configuration / ATFM

The BLUE MED Network Catalogue (BMRNC), was finalized in the Definition Phase containing over 230 new airspace design proposals that are in line and beyond the scope & timeframe of ARN Version-7.

BLUE MED is implementing FRA, coordinated through the NM European Route Network Improvement Plan (ERNIP) and the Network Operations Plan.⁴⁵ This initiative would be adopted with or without a FAB. BLUE MED states have begun implementing the first set

⁴⁴ Local Single Sky ImPlementation (LSSIP) for Italy, Greece, Malta and Cyprus (2015)

⁴⁵ European ATM Master Plan Level 3 Report - Implementation View - 2015

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

of Direct Routes to create a Direct Route Airspace. Phase 1: Direct Routes – INTRA FIR with the two later phases to follow.

Greek ATC sector ATFM regulation due to lack of capacity. ATFCM Task Force set up to do daily flow monitoring to offer the AOs shorter routes within BLUE MED area, with no delays. Thanks to the efforts of Greece, Malta, Cyprus and Italy specific flows on specific routes were identified within the Greek airspace, that could be excluded from the ATFCM regulations resulting in reduced delay on what might otherwise have occurred. The plan is to adopt the procedure going forward.⁴⁶

Convergence of operational concepts and systems

There are no detailed plans for the configuration of service delivery cross borders, of ACC rationalisation, of dynamic sectorisation or virtual centres.

The major projects under the Operational concept include:

- Route Network Catalogue and Free Route Operations.
- Flight Efficiency Plan (FEP).
- Cross-border optimisation and Letter of Agreement standardization, the aim being to gradually converge to harmonised BLUE MED standards.
- ATFCM optimisation: to improve the ATFCM coordination within the FAB, including the implementation of STAM measures and other ATFCM coordination initiatives (Identification of an FMP coordination process).
- Air Data Quality (ADQ): to implement in a harmonised manner the provisions contained within the Commission Regulation (EU) No 73/2010 on the quality of aeronautical data and aeronautical information.
- Airport CDM (A-CDM): as an opportunity to cooperate on technical and operational aspects related to A-CDM implementation⁴⁷.

NB, these appear to be statements of intent rather than plans and are also State-level requirements of ERNIP which would be required with or without the FAB.

Rationalisation of systems and equipment

The major projects detailed on the FAB website under the Technical concept which are all SESAR or other initiatives, which have been adopted as FAB initiatives; There is no FAB timeline for these, possibly because the European ATM Master Plan (Level 3) timeline provides the frame of reference. The projects are; Air Ground Data Link (AGDL), IP Network (full migration to IPv6, Complementary OLDI messages, Radar sensor data exchange SLA and Surveillance Maintenance Plan per the Regulation (EU) No 1207/2011.

⁴⁶ BLUE MED BLUE MED Newsletter Number 7

⁴⁷ European ATM Master Plan Level 3 Report - Implementation View - 2015

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

More generally there is a statement of intention to establish a FAB-coordinated Radar Maintenance Plan and to establish, at FAB level, a common strategy for the ATM System developments ATM System Upgrade and SESAR Programme.⁴⁸

There is an opportunity for a FAB approach to FDPS renewal given most FDPS in the FAB are due for replacement around the same time: Cyprus have Thales FDP implemented in 2013. Malta are implementing SELEX ES by end of 2016, in Greece the ATM system upgrade is being finalised by the end of 2016 and a new system planned for 2020. ENAV have a new system planned 2019.

Three of the four BLUE MED partner ANSPs DCAC, ENAV and MATS are participating to the EU Funding programme 'ANSPs IDP Implementation Project' along with following ANSPs: DFS, DSNA, EANS, ENAIRE, FINAVIA, LGS, NATS, NAV Portugal. BLUE MED position this as a FAB initiative. However, it does not involve all FAB members and obviously extends well beyond the FAB.^{49,50,51}

BLUEGNSS is a H2020-Galileo-2015-1 project co-financed by GSA (the European GNSS Agency). The consortium, led by ENAV, is composed of the BLUE MED FAB ANSP Partners - DCAC, HCAA and MATS - and IDS (Ingegneria dei Sistemi). The primary objective of the BLUEGNSS Project is to harmonize the implementation of PBN approach operations among the BLUE MED FAB States by using EGNSS (European GNSS infrastructure such as EGNOS). One of the advantages of such an approach is that States/ANSPs that don't have enough experience in RNP approach operational implementation will receive benefits from this intra-FAB cross fertilization. NB, it is not clear how PBN approaches assist with the FAB aims for en route airspace.

An issue in analysing BLUE MED is the available literature seems to refer to ANSP projects as FAB projects. This is evident in LSSIP FAB project reporting where the four BLUE MED ANSP are not even reporting the same projects as being FAB projects. I.e. there is no consistency between States' reporting on FAB projects⁵².

Rationalisation of support services

There are no demonstrable achievements, but two FAB initiatives relating to support services have been identified:

- Training - the FAB is investigating a gradual convergence towards a BLUE MED standard.
- The FAB is investigating a FAB-coordinated Radar Maintenance Plan.

⁴⁸ European ATM Master Plan Level 3 Report - Implementation View - 2015

⁴⁹ <http://www.bluedmed.aero/> ANSPs IDP Implementation Project.

⁵⁰ FAB Performance Plan BLUE MED

⁵¹ Local Single Sky Implementation (LSSIP) for Italy, Greece, Malta and Cyprus (2015).

⁵² European ATM Master Plan Level 3 Report - Implementation View - 2015.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**Performance scheme

The performance of ANSP against the RP1 targets and situation of the FAB partners for setting RP2 targets is so disparate that the concept of a FAB performance plan is somewhat hypothetical. It may exist but is no more than a combination of 4 states plans.

- Safety: the FAB targets submitted for RP2 are consistent with European wide target.
- Environmental: the FAB target for RP2 is consistent with European wide target
- Capacity: capacity deficit is expected for each year of RP2. This is primarily due to Malta capacity planning to decline over RP2.
- Cost: Italy's en route direct costs represent 75% of the total en route costs for the BLUE MED FAB over RP2 (Malta is 2%) thus the FAB target reflects Italy' situation. Despite an increase in determined unit costs relative to other FABs, by 2019 the BLUE MED FAB unit cost will be slightly lower than the EU average.⁵³

2.3.4 Assessment of economic aspects

2.3.4.1 FAB CBA analysis

The study team did not have the full CBA for the BLUE MED FAB, but received a power point summary document. This section is based on this document.

The overall probabilistic NPV of the BLUE MED FAB lies in the range €1,3 – 1,7 billion for the 2012-2020 period.

- Fuel savings and delay reductions are driving these numbers, roughly in the same order of magnitude. Time benefits and CO2 benefits are also quantified but are relatively minor.
- Flight efficiency benefits stem from route redesigns and FRA. Delay benefits from route optimisation and sector configuration improvements.
- It was indicated that short term benefits would already materialise. The document refers to already € 47 million of benefits for users in 2012.

As described in 2.2.3 above, some initiatives in the area of FRA and airspace configuration has been taken.

In response to the survey of the study team, BLUE MED reported that the several FRA operations have been performed in close cooperation with the Network manager. It is however doubtful if these already resulted in the benefits anticipated in short term in the CBA. As for delay reductions, BLUE MED indicated significant delay reductions, following the implementation of actions which were expected to provide relevant benefits on ATFM delay. The overall period May-September 2016 has shown an improvement in the reduction of en-route ATFM delay by an average of 77%. BLUE MED did not quantify these in financial benefits.

⁵³ PRB Assessment of BLUE MED RP2 FAB Revised Performance Targets

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

On cost savings in relation to lowering costs of service provision, BLUE MED indicated that the benefits of several activities have not been quantified yet, although they have led to improvements to the service provided.

2.3.4.2 Performance in cost-efficiency KPA (actual performance RP 1)

The performance in terms of cost efficiency during RP1 is provided in the following table. Cost efficiency was only reported on individual ANSP level during RP1. Data for 2015 (first year RP2) are not yet available. Values in red indicate the actual rate was higher than the target.

	2012		2013		2014	
	Target	Actual	Target	Actual	Target	Actual
Cyprus	€ 33.41	€ 33.57	€ 32.88	€ 32.27	€ 32.70	€ 30.06
Greece	€ 32.55	€ 32.73	€ 31.36	€ 33.00	€ 30.02	€ 29.55
Italy	€ 71.38	€ 71.11	€ 69.13	€ 69.55	€ 66.78	€ 72.07
Malta	€ 25.86	€ 20.62	€ 23.88	€ 20.07	€ 22.92	€ 22.09

Source: PRB Monitoring reports

As indicated above, the BLUE MED en-route cost base is for 75% based on the cost base of the Italian service provider. This means that cost-efficiency improvements did not substantially occur in the BLUE MED FAB during RP1. This is not at the expense of the user, as the ANSP is supposed to cover the gap between the target and actual unit rate itself.

2.3.4.3 Unit costs RP 2, unit rates and charging zones

The following determined unit costs for RP 2 apply on FAB level, based on the FAB performance plan.

	2015	2016	2017	2018	2019
TSUs	8558	8866	9207	9554	9898
Real en route UCs/DUCs (in €₂₀₁₂ prices)	78,84	78,23	77,33	74,41	71,43
Trend in real en route UCs/DUCs (in €₂₀₁₂ prices) %_{n/n-1}	N/A	-0,77%	-1,15%	-3,78%	-4,00%
Real en route UCs/DUCs (in €₂₀₀₉ prices)	71,16	69,84	68,15	64,61	61,05

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

	2015	2016	2017	2018	2019
Trend in real en route UCs/DUCs (in €₂₀₀₉ prices) %on/n-1	N/A	-1,86%	-2,41%	-5,21%	-5,51%

Source: PRB assessment of revised Performance Plan

The unit rates of en route charges applicable to December flights (in €, based on November 2016 exchange rates) for the FAB member states are as follows:

Cyprus:33.66
Greece:36.11
Italy:80.17
Malta:25.88

The following charging zones apply:

- en route charging zones: 4 (Cyprus, Greece, Malta, Italy).
- terminal charging zones: 5 (Cyprus 1; Greece 1; Malta 1; Italy 2)

From an earlier study commissioned by DG MOVE⁵⁴, it is known that BLUE MED has considered the possibility to introduce a common level charging zone. BLUE MED has investigated the implications of a common charging zone, and a number of issues had been identified.

In response to the ANSP level data collection questionnaire of our study, BLUE MED indicated that a common charging zone would not be beneficial. The challenge would be to match the particular circumstances of the four BLUE MED states with great differences in size, institutional structures and cost bases.

2.3.4.4 Resource-efficiency measures in core services and support services

As indicated in section 2.2.3 above, there is no evidence that in categories as rationalisation of infrastructure or rationalisation of support services any measures have been implemented.

In response to the ANSP level data collection questionnaire, BLUE MED has reported on several initiatives for resource-efficiency measures. These include:

- Joint training and training infrastructure of ANS personnel
- Joint maintenance
- Common CNS infrastructure developments
- Cross-border service provision or cross-border delegation of ANS
- Coordinated AIS provision

It is not clear when these initiatives would lead to financial benefits and what the magnitude of the benefits will be.

⁵⁴ SDG, 2015, Policy options for the modulation of charges in the Single European Sky.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

2.3.4.5 Conclusions on economic aspects of the FAB

The BLUE MED FAB foresaw large economic benefits in the CBA. These have not materialised to full extent. However, judging from the implemented operational and technical projects, some benefits have been realised. It has not been possible to assess the costs and benefits in the light of reports published by the PRB and NM, as those reports provide no substantial basis on which this could be conducted.

The BLUE MED FAB has incurred administrative costs to set up and run the FAB, but has not reported on these costs and these costs can therefore not be assessed.

In terms of technical harmonisation and rationalisation, the study team has not found evidence of any implemented projects.

The BLUE MED FAB is in the initial implementation process of FRA requirements of ATM Functionality 3 of Regulation (EU) 716/2014. It has not become clear to the study team if the benefits of FRA can be attributed to the FAB initiative, or whether it has been driven by European ATM Master Plan (Level 3). FRA could have happened regardless of the FAB initiative.

2.4 DANUBE FAB

2.4.1 General information

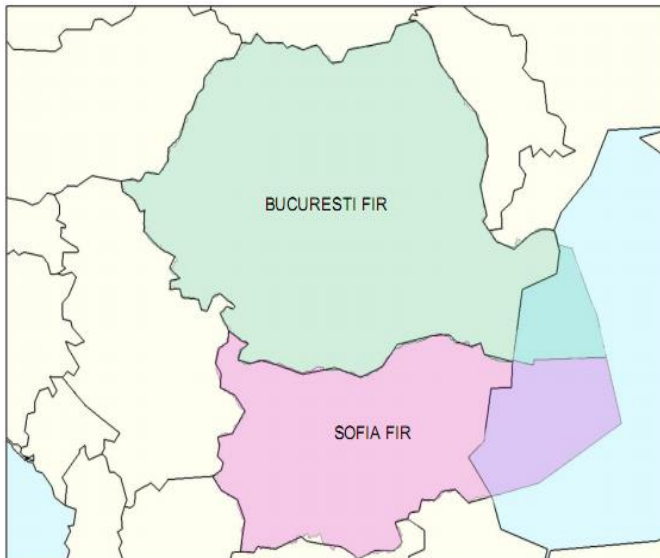
The **DANUBE FAB** comprises the Republic of Romania and Republic of Bulgaria, and was formally established through the State-level Agreement⁵⁵ signed by the two participating Member States.

The table below summarises the constituent entities of DANUBE FAB:

Table 6 DANUBE FAB overview

Member States	Air navigation service providers	National authorities	supervisory
Romania	Romanian Air Traffic Services Administration (ROMATSA)	Romanian Civil Authority (RCAA)	Aeronautical
Bulgaria	Bulgarian Air Traffic Services (BULATSA)	Directorate General Aviation Administration (DG CAA) of the Republic of Bulgaria	Civil

Figure 9 DANUBE FAB geographic scope



As pictured on the attached map, the geographic scope of DANUBE FAB encompasses the flight information regions (FIR) of Romania and Bulgaria, including those parts of the high seas where the both States have accepted, pursuant to a regional agreement, the responsibility of providing air traffic services⁵⁶.

It was agreed that terminal operations are currently outside the scope of the FAB. The DANUBE FAB area includes 6 TMAs (Burgas, Sofia, Varna, Bucharest, Constanta and Arad) and 22 CTR at all airports (except Brasov Cobrex heliport)⁵⁷.

Sofia, Varna, Bucharest, Constanta and Arad) and 22 CTR at all airports (except Brasov Cobrex heliport)⁵⁷.

⁵⁵ Agreement on the establishment of the DANUBE Functional Airspace Block between Romania and the Republic of Bulgaria (signed but without a date)

⁵⁶ DANUBE FAB State Level Agreement, art.(1)

⁵⁷ Consulting services for the elaboration of Cost Benefit Analysis and the Business Case for the DANUBE FAB functional airspace block covering the airspace of the Republic of Bulgaria and the airspace of Romania Business Case - Final Report. Updated November 2012, cpt.3.1.7.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The services included in the scope of DANUBE FAB cooperation (pursuant to FAB Agreement) include en route ATS, CNS, MET and AIS/AIM⁵⁸.

DANUBE FAB ANSPs cooperate in terms of harmonization of staff training and staff selection activities and common Training Policy for all operational staff (ATS, AIS, MET and ATSEP). What form this takes is unclear. Cooperation between Romanian and Bulgarian national SAR Coordination Centres is planned, but what form this takes is not clear⁵⁹.

The bulk of traffic is en route overflights, 95% in the case of Bulgaria and 80% for Romania.

2.4.2 Institutional and legal arrangements

2.4.2.1 Legal basis

The DANUBE FAB is built upon the following agreements concluded at State, NSA and ANSP level:

- *Agreement on the establishment of the DANUBE Functional Airspace Block between Romania and the Republic of Bulgaria* (date of signature not specified in published version of document);
- *Memorandum of Understanding on cooperation in ATM & ANS matters and on preparation for establishment and implementation of functional airspace block - DANUBE FAB between the Romanian Civil Aeronautical Authority (RCAA) and the Directorate General for Infrastructure and Air Transport, Ministry Of Transport And Infrastructure Of Romania (MTI/ DGIAT) and the Directorate General "Civil Aviation Administration" of the Republic Of Bulgaria* (date of signature not specified in published version of document);
- *Memorandum of Understanding between Romanian Air Traffic Services Administration (Romatsa) and the Bulgarian Air Traffic Services Authority (Bulatsa) on cooperation in ANS Provision Matters and for the establishment of a Functional Airspace Block, comprising the national airspace of Romania, the national airspace of the Republic Of Bulgaria and the airspace included in the scope of the International Legal Obligations of Romania and the Republic Of Bulgaria (DANUBE FAB)* (signed on 10th of August 2010);
- *DANUBE Functional Airspace Block ANSP Cooperation Agreement between Bulgarian Air Traffic Services Authority and the Romanian Air Traffic Services Administration* (date of signature not specified in published version of document).

2.4.2.2 Governance

The DANUBE FAB State Agreement provides the overarching legal framework for the governance of the FAB. The governing bodies of the DANUBE FAB are:

- the Governing Council;
- the NSA Board;

⁵⁸ DANUBE FAB State Level Agreement, art.(13)

⁵⁹ DANUBE FAB response to ANSP level data collection questionnaire

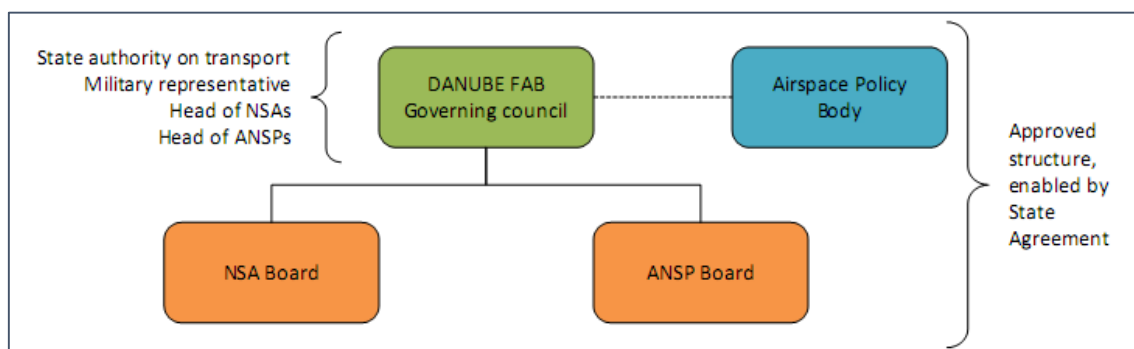
**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- the ANSP Board⁶⁰.

In order to fulfil their tasks, the aforementioned governing bodies may set up specialised Standing Committees or other supporting bodies, composed of relevant experts nominated by the State authorities, the NSAs and/or the ANSPs.

The DANUBE FAB governance arrangements are illustrated in the chart below:

Figure 10 Governance structure of DANUBE FAB



We are outlining below the key tasks and responsibilities of each body:

The DANUBE FAB Governing Council is the main high level body of the FAB with the responsibility for providing oversight and approval of key FAB documentation (annual plans, safety policy, airspace policy, performance plans etc.). It is composed of one high level representative of the State authority on transport of each Party, one representative from the authority responsible for military aviation in each Party, the Heads of both NSAs and the Heads of both ANSPs. The State authorities on transport and defence of each Party may also nominate other representatives with consultative and advisory functions. The Governing Council meets regularly, not less than twice in a calendar year.⁶¹

The DANUBE FAB NSA Board is a body that guarantees the formal coordination between the NSAs and provides an interface for supervisory tasks at DANUBE FAB level. It is composed of the heads of the NSAs of both States as well as by representatives nominated by them. Representatives of national authorities and of the ANSPs as well as relevant stakeholders may be invited, as necessary, to attend the NSA Board meetings as observers⁶².

The Airspace Policy Body is a body responsible for the joint civil-military coordination process and for the flexible use of airspace application within the cross-border airspace. It is composed of representatives for each Party from the State authority on transport, State authority on defence, Military aviation authorities, CAAs, ANSPs and from the Military air traffic service provision authorities.

The ANSP Board constitutes a body that oversees the implementation of the FAB at the ANSP level. It is composed of the ANSP Directors General (co-chairing the ANSP Board) and of other representatives from both ANSPs. Representatives of the State authorities

⁶⁰ DANUBE FAB State Level Agreement, art.(9)

⁶¹ DANUBE FAB State Level Agreement, art.(10)

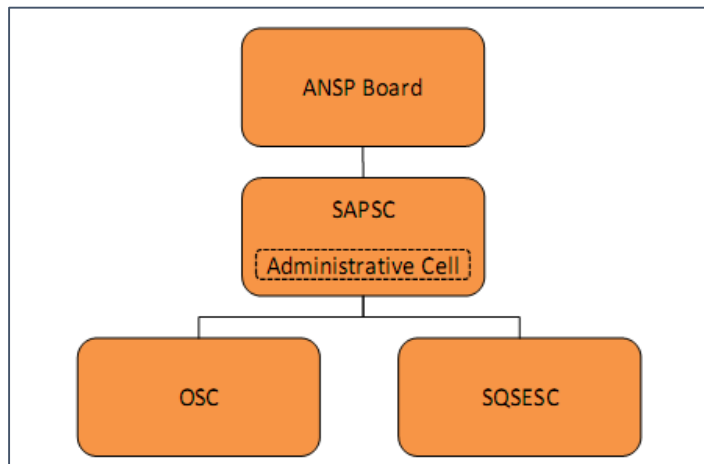
⁶² DANUBE FAB State Level Agreement, art.(11)

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

on transport and defence and of the NSAs may be invited, as necessary, to attend the ANSP Board meetings as observers.⁶³⁶⁴

The chart below highlights the ANSP-level governance structure built up around the ANSP Board.

Figure 11 ANSP Level Governance structure of DANUBE FAB



The ANSP Board is assisted by the Strategy and Planning Standing Committee (SAPSC) in all DANUBE FAB cooperation domains – the SAPSC is composed of ANSP experts. Further support and advice are provided by the Operations Standing Committee (OSC) which carries out work in the areas of operations, technical and training, and by the Safety, Quality, Environment and Security Standing Committee (SQSESC) which performs the necessary tasks in the specified areas.

The Administrative Cell supports the SAPSC and is guided in its work by a set of overarching documents including the Project Management Plan (including the Communications Plan and Quality Management Plan) as well as the DANUBE FAB State Agreement and ANSP Cooperation Agreement⁶⁵.

The decisions of the DANUBE FAB bodies are taken unanimously, each State having a single vote. In case the DANUBE FAB bodies fail to reach unanimity, the open issues are raised for decision to the State Authorities on transport and/or defence of the Parties.⁶⁶

⁶⁷

In addition to the governance and institutional set up, it is important to note down the Danube Strategic Programme 2016-2020 document, which sets out the ambitions and goals i.e. “strategic objectives” of DANUBE FAB and presents the high level overview of how and when these objectives are to be achieved. On top of the Strategic Programme, the DANUBE FAB develop Annual Plans that build upon the Strategic Objectives,

⁶³ DANUBE FAB State Level Agreement, art. (12)

⁶⁴ DANUBE FAB ANSP Cooperation Agreement, art (5)

⁶⁵ DANUBE FAB Strategic Programme 2016-2020

⁶⁶ State Level Agreement, art. (10), (11), (12)

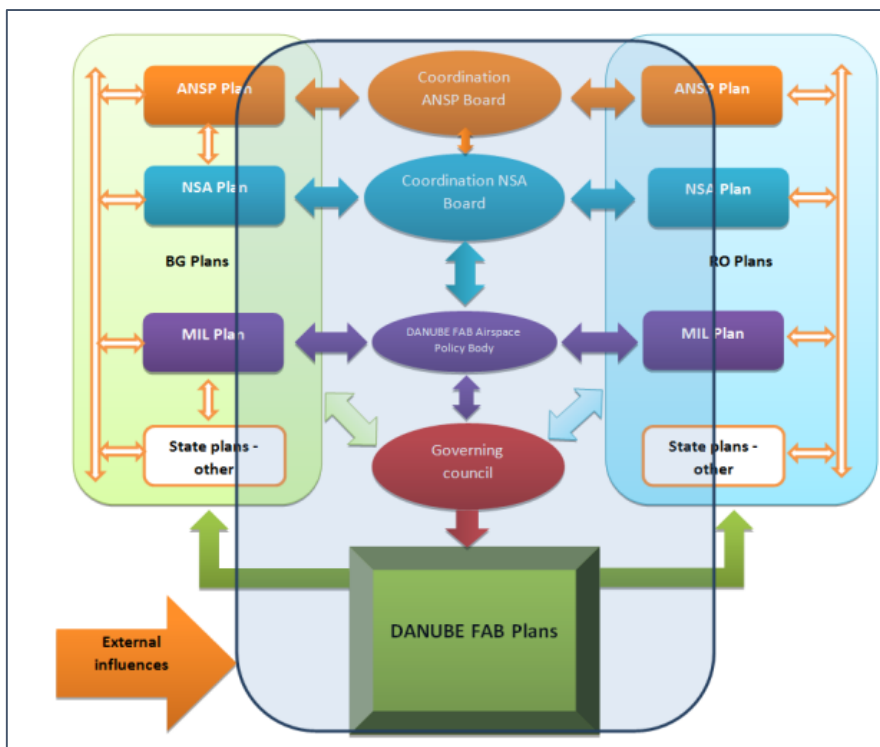
⁶⁷ FAB DANUBE FAB response to ANSP level data collection questionnaire

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Implementation Projects, Activities and Tasks, as established in the Strategic Programme 2016 – 2020 by also identifying a number of High Priority Projects.

The articulation of the DANUBE strategic planning is highlighted in the figure below.

Figure 12 Inputs to the DANUBE FAB Strategic Programme ⁶⁸



2.4.2.3 NSA cooperation

The NSA Board provides a formal coordination and interface forum between the NSAs involved on the ongoing compliance of the ANSPs and related matters as well as on the fulfilment of the tasks related to the preparation for establishment of DANUBE FAB.

The NSA Board is constituted of representatives from the NSAs involved with the appropriate expertise relevant to the regulatory and supervision functions performed in respect of the implementation of the DANUBE FAB. The NSA Board is co-chaired by officials from both NSAs. The number of members of the NSA Board is not fixed and, depending on the matters to be discussed, additional representatives of each State may participate.

There are terms of reference for the NSA Board and two annual meetings are held. The activities are based on the annual plans. Besides, the focus is on the oversight of safety arrangements within the FAB. ⁶⁹

The areas under consideration within NSA Board are among others: DANUBE FAB Policy and Strategy under the remit of the NSA (area of responsibility, point of contacts,

⁶⁸ DANUBE Strategic Programme, cpt. 1.2

⁶⁹ Telephone interview with the DANUBE FAB NSAs, 16 November 2016; DANUBE FAB response to NSA level data collection questionnaire

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

harmonized regulatory and supervision approach, etc.), NSA processes under common preparation (audits, inspections, certifications, surveys, etc.). The matters related to these areas are the basis for the agenda of meetings.⁷⁰

Exchange of information is an integral part of DANUBE FAB NSA Board meetings and covers in particular the following aspects:

- status of ANSP certificates
- oversight programmes
- results of ongoing oversight
- where appropriate, exchange of information about outcomes of EASA standardisation inspections
- exchange of information on the accepted changes in the ATM system.

As regards joint oversight, the NSA Cooperation Agreement foresees the possible participation of each NSA as observer in audits carried out by the other NSA. Examples are the participation of Romanian NSA inspectors in an audit in Bulgaria in 2013 and of Bulgarian NSA inspectors in audits in Romania in 2014 and 2015. Two common audits are also planned for 2017.⁷¹

Until now, there is no NSA pool of experts in place within the FAB and there has been no plan for full participation of visiting inspectors (beyond the observer status currently applicable) in the audit teams.⁷²

Currently there is no common NSA Manual on FAB level, but there are some common procedures used mainly for cross-border activities. There is an NSA procedure expert group which main task is the harmonisation of procedures by the two NSAs. There has been discussion about moving towards a more harmonised approach.⁷³

For the time being, there is no plan regarding a common training programme at FAB level for NSAs' inspectors. However, a joint task force has been established for the purpose of harmonising methodologies and identifying the training needs for NSAs' staff.⁷⁴

The performance plan target values are in the first place prepared and approved at national level. They are then aggregated at FAB level for the FAB performance plan. The FAB performance plan is signed by the Directors General of CAAs and is formally approved by the FAB Governing Body before being submitted to the EC. There is no process for the joint review of ANSPs investments.⁷⁵

⁷⁰ Memorandum of Understanding between NSAs (RCAA and GIAT), art. 2, 3 and Annex I

⁷¹ Telephone interview with the DANUBE FAB NSAs, 16 November 2016; DANUBE FAB response to NSA level data collection of the FAB study

⁷² Telephone interview with the DANUBE FAB NSAs, 16 November 2016

⁷³ Telephone interview with the DANUBE FAB NSAs, 16 November 2016

⁷⁴ DANUBE FAB response to NSA level data collection of the FAB study

⁷⁵ DANUBE FAB response to NSA level data collection of the FAB study; Telephone interview with the DANUBE FAB NSAs, 16 November 2016

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The NSAs have defined the way forward and priorities of FAB-level cooperation in the *DANUBE FAB Strategic Programme 2016-2020* document (medium term priorities) and in the *Annual Plan 2016* (short term priorities). The planned medium term actions include ^{76 77}

The identified main challenges relating to NSA cooperation within the DANUBE FAB are the harmonisation of training for the NSAs' staff (in principal due to frequent changes of EU applicable legislation) as well as the identification of training organisation for NSA staff (notwithstanding training provided by IANS).⁷⁸

2.4.2.4 Customer engagement, stakeholder consultation and communication⁷⁹

The dissemination of information on the DANUBE FAB takes place regularly through, for example, the DANUBE FAB website and newsletters.

The DANUBE FAB foresees the possibility to organise specific customer consultation meetings with stakeholders in order to:

- Inform airlines about the implementation of the DANUBE FAB
- Promote a common understanding of the DANUBE FAB
- Collect feedback and comments on the project and its orientation.

Airspace users were consulted regularly throughout the process of DANUBE FAB establishment. After the FAB establishment, consultation meetings with airspace users have been held in connection with the implementation of the SES performance and charging schemes.

The DANUBE FAB website features a number of sections, outlining the FAB institutional and operational features, strategic objectives and key activities. All the key FAB documentation (including updated versions) are available on the website. Furthermore, the website offers regular news updates on the FAB developments.

2.4.2.5 Social dialogue

The DANUBE FAB has established a mechanism for consultation of the staff of the ANSPs, namely the DANUBE FAB Social Consultation Forum (SCF). Provisions for social dialogue are set within the DANUBE FAB ANSP Agreement.

The SCF is a permanent body tasked with the implementation of social cooperation within the framework of the DANUBE FAB. Established since 2010, the DANUBE FAB SCF is composed of representatives of management, trade unions and professional associations of both ANSPs. The SCF meets regularly twice per year and has on its agendas items of a social nature at FAB level. Additional ad hoc meetings may be convened out of cycle, on request of either the social partners or ANSPs. There is also the option to use written consultations if views of social partners are required outside of a meeting cycle, for

⁷⁶ DANUBE FAB Strategic Programme 2016-2020, ed. 1.0, dated April 2016

⁷⁷ DANUBE FAB Annual Plan 2016, ed. 1.0, March 2016

⁷⁸ DANUBE FAB response to NSA level data collection of the FAB study

⁷⁹ Information sources: FAB website (<http://www.danubefab.eu/en/home/>); DANUBE FAB response to ANSP level questionnaire

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

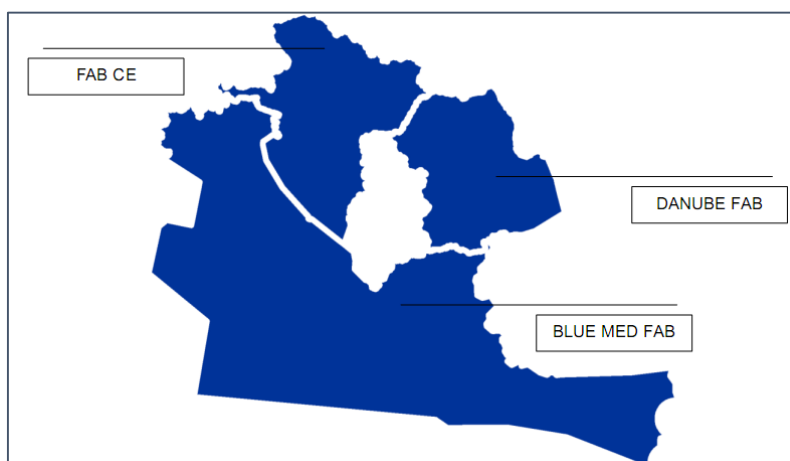
example via an exchange of letters. Social partners are also consulted prior to an ANSP Board, and their comments are fed into discussion at the ANSP Board.^{80 81 82}

The eleventh DANUBE FAB Social Consultation Forum (SCF) was held in Poiana Brasov, Romania on 26th of May 2016. The meeting promoted social dialogue within the FAB and ensured that attention was given to the social issues arising from DANUBE FAB's implementation. These regular consultations increase the mutual understanding between the social partners and their national member organisations ROMATSA and BULATSA.

2.4.2.6 Inter-FAB cooperation and cooperation with Third countries ^{83 84 85 86 87 88}

The DANUBE FAB actively cooperates and coordinates with other FABs, particularly with its neighbouring FABs, the BLUE MED FAB and FAB CE, with which ANSP level cooperation agreements have been signed. It is a priority of the DANUBE FAB to build on these agreements to initiate new projects or extend existing projects regionally to neighbouring FABs.

Figure 13 Inter-FAB Cooperation ⁸⁹



The cross border Night FRA (SEEN FRA) project includes neighbouring Hungarian airspace. This will allow Airspace Users complete freedom to plan routes throughout the combined airspace of the three countries at night, paving the way for future expansion - subject to the timing and scope of the FAB CE implementation of FRA.

⁸⁰ DANUBE FAB ANSP Cooperation Agreement, art. (4), (25)

⁸¹ http://www.danubefab.eu/en/articles_32/--_13.htm

⁸² http://www.danubefab.eu/en/news_1/Eleventh-meeting-of-the-DANUBE-FAB-Social-Consultation-Forum-%28Poiana-Brasov--Romania--26-May-2016%29_82.htm

⁸³ DANUBE FAB Strategic Programme 2016-2020

⁸⁴ DANUBE FAB Annual Plan 2016

⁸⁵ DANUBE FAB Annual Reports

⁸⁶ DANUBE FAB Summer 2016 Newsletter

⁸⁷ DANUBE FAB Cross-Border Sectors application for SES Awards

⁸⁸ DANUBE FAB Winter 2015 Newsletter

⁸⁹ DANUBE FAB Strategic Programme 2016-2020, page 16

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The DANUBE FAB has articulated a long term strategy of extending its geographical scope. To this end a pre-feasibility study for FAB enlargement is planned. The study, will analyse the DANUBE FAB's regional environment and investigate the compatibility of neighbouring third countries with the DANUBE FAB.

Examples of existing mechanisms and initiatives with third countries:

- Representatives of the Republic of Moldova have attended meetings of the DANUBE FAB Governing Council and DANUBE ANSP Board. The DANUBE FAB has provided Republic of Moldova full information on the process for receiving the Observer Status;
- A communications triangle between Bucharest-Sofia-Belgrade was established, allowing routing communications between the three ATC Control Centres (ACCs) with the purpose of providing a contingency solution;
- DANUBE FAB has granted Observer Status to the Republic of Macedonia.

2.4.3 Operational context and status

2.4.3.1 Overview of operational and technical elements

DANUBE FAB	
Geographic scope and traffic features	<ul style="list-style-type: none"> • The FAB's borders are those of the States involved and do not take into account air traffic flows, potentially causing inefficiencies in routing of over-flights which a broader geographic scope would assist in overcoming. This is evidenced by the introduction of FRA which is being undertaken in conjunction with Hungary. • There is a mix of traffic with the main routes from NW to SE with flights already established in cruise. The overflying traffic consists of five main two-way flows, as follows: Turkey; Middle East (ICAO Zone O); Far East (ICAO zones V and W); Greece, Cyprus and Israel; North-East Africa. • There has been a 30% increase in traffic since 2014 with closure of Ukrainian airspace and Syrian routes.
Number of States	<ul style="list-style-type: none"> • Two State FAB - Bulgaria and Romania.
Scope of FAB service provision	<ul style="list-style-type: none"> • En-route ATS, CNS, MET, AIS in FIR are within scope. • TMA and Aerodrome service provision not included. • SAR provision is not included.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

<p>FAB Business/Implementation Plans</p>	<ul style="list-style-type: none"> The FAB’s Strategic Operational Plan and Annual Business Plans primarily set out cooperation on the adoption of Pan-European requirements, which are required outside of the FAB context. There appears limited ambition to develop joint services, although the two States have a legal framework in place to support joint procurement.
<p>Airspace configuration / ATFM</p>	<ul style="list-style-type: none"> Extensive redesign of airspace routing and sectors in conjunction with the Network Manager in support of implementation of the ERNIP.
<p>Convergence of operational concepts and systems</p>	<ul style="list-style-type: none"> Decision to select the “partial integration” alternative for the DANUBE FAB means each is responsible services in its own airspace. Thus Concept of Operations is limited to; <ul style="list-style-type: none"> ○ harmonised ATS procedures, ○ an integrated approach to airspace design and flow management and ○ sharing of best practices
<p>FAB integration for delivery of the new technology AND Rationalisation of systems and equipment</p>	<ul style="list-style-type: none"> Different FDPS and no plans for common system. Intend to conduct common procurement for VCS. Intend to co-operate in deployment of SESAR and EATM Master Plan.
<p>Rationalisation of support services</p>	<ul style="list-style-type: none"> No plans for rationalisation of ATC Training, AIS publication, SAR, MET

The DANUBE FAB operational highlights are:

- A small cross-border area has been established - provides proof of concept.
- The FAB is engaged with the Network Manager on airspace design ASM, ASFM. Thus they have engaged with and used available experts, potentially accelerating progress over what the FAB could otherwise achieve using its own resources.
- Night time free-routing (FRA) is planned for Jan 2017. This is the implementation of AOM21.2 which is a European ATM Master Plan (Level 3) objective that is functionally related to ATM Functionality 3 of Reg. (EU) 716/2014 on the establishment of the Pilot Common Project.
- Technical roadmap reflects priorities for deployment of SESAR and EATM Master Plan. BULATSA and ROMATSA intend to conduct common procurement for VCS.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The study has also observed:

- The airspace is small and not aligned to major traffic flows. It bisects both E-W and N-S flows and cannot significantly influence the En route ATS network in isolation from neighbouring states.
- The ANSPs have different FDPS systems and capacity is limited. They are both replacing ATM Systems but at different times so this is not a joint procurement. However, an agreement has been reached to commonly procure a data-link solution for air ground communication.
- Incompatible FDPS and no short term plan to implement common platform mean the technology required to support extensive cross border areas, dynamic sectorisation and other approaches to service rationalisation is not available.
- Services will be provided from the two existing ATC centres. No ACC consolidation or dynamic sectorisation is included in the FAB Operational Concept.
- A dedicated project office for planning and coordination.
- TEN-T funding has been used for technical procurements and the FAB has also used funding to engage specialist consulting advice to support the operation of the FAB.

2.4.3.2 Detailed review

Airspace configuration / ATFM

DANUBE FAB has had historically a good delay performance record. This is in spite of a significant increase in traffic volume associated with the Ukraine crisis and the re-routing of major traffic flow. Exceptions are rare and mostly related to unexpected events in adjacent FIRs, which significantly alter the traffic levels and flow distribution within a short period of time.

Key development issues are:

- Regional traffic flow changes due to regional conflict makes planning and achievement of performance targets problematic for capacity, environment and cost effectiveness.
- The proposed DANUBE FAB routes are part of the ERNIP. Integrated Airspace Management (ASM) and Air Traffic Flow and Capacity Management (ATFCM) processes within the collaborative air traffic management framework are to be gradually applied within the DANUBE FAB area⁹⁰.
- A re-designed airspace and optimised route network has been developed, in the context of DANUBE FAB project, by the DANUBE FAB Airspace Design and Operations Development Expert Group (ADODEG). This is a Subgroup of the DANUBE FAB Operational and Civil / Military Coordination Working Group (WG). This comprises 95 new and dedicated DANUBE FAB route Projects, 88 of which are currently agreed for

⁹⁰ PRB Assessment of RP2 FAB Revised Performance Targets DANUBE FAB Version 3.1 - 16/10/2015

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

implementation.⁹¹ Much of this progress is down to engagement with the Network Manager and EUROCONTROL experts in the ADODEG Sub Group, whose work underpins the design and simulation of options.

The integrated Airspace Management (ASM) and Air Traffic Flow and Capacity Management (ATFCM) process within the collaborative air traffic management framework is to be applied within the FAB by:

- Gradual integration of ASM and ATFCM functions at FAB level;
- Increase in the use of conditional routes (CDRs) to optimise ASM and implementation of FAB level LARA⁹².

ATS airspace in the Bucharest FIR and Sofia FIR was not harmonised. The airspace classification was to be harmonised within the FAB⁹³.

A pre-cursor to the cross border initiative implemented in 2016⁹⁴ was the development of alternate ATS routes to optimize the civil-military coordination and improved flight planning processes for activation of danger areas (completed in 2012).

Convergence of operational concepts and systems

There is little evidence of integration of core services:

- The FAB is planning to implement harmonisation mechanism for operational procedures in Dec 2016 but it is not clear what this means and the extent of rationalisation.⁹⁵
- En-route Air Traffic Services will continue to be provided from the two existing ATC centres in Bucharest and Sofia.
- Terminal ATS will be provided by ROMATSA's and BULATSA's respective ATSUs.
- There is no concept of ACC consolidation in the FAB Operational Concept.

The following activities have been identified:

- There is some planning for new technology set out in the 'Operational Procedures Harmonisation Plan' concerning procedures to be amended for the implementation of new technology (e.g. A-SMGCS, ADS-B, CPDLC and etc.). This would, however, be required irrespective of the FAB.
- The implementation of FRA is coordinated through the NM European Route Network Improvement Plan (ERNIP) and the Network Operations Plan following the Strategic Objectives and Targets set in the Network Strategic Plan and in the Network Manager Performance Plan.⁹⁶ This initiative would be adopted with or without a FAB.

⁹¹ DANUBE FAB CONCEPT OF OPERATIONS, Edt 3 - 05.12.2013

⁹² DANUBE FAB CONCEPT OF OPERATIONS, Edt 3 - 05.12.2013

⁹³ DANUBE FAB CONCEPT OF OPERATIONS, Edt 3 - 05.12.2013

⁹⁴ DANUBE FAB CONCEPT OF OPERATIONS, Edt 3 - 05.12.2013

⁹⁵ CANSO news item 27 JULY 2016

⁹⁶ DANUBE FAB ANNUAL PLAN 2016

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- Implementation of night FRA at FAB level was planned to start in Jan 2017 with full implementation by 2019.⁹⁷ This activity has been supported by TEN-T funds. Alongside the implementation of DANUBE FAB FRA, an inter-FAB Free Route Airspace was implemented at night between Romania and Hungary. This highlights the value of cooperation outside the FAB but also that FRA is not really a FAB initiative – rather a Network Manager initiative.

Rationalisation of systems and equipment

- The FAB Strategic Plan notes that deployment of SESAR is increasingly becoming a FAB level activity. The activities addressed under this project area include the various requirements related to the deployment of SESAR on schedule. However, non-SESAR activities with a common aspect that affect the infrastructure and system design are also covered in this area. Further activities and lines of action are likely to be included under this project to help to prepare for implementation of the EATM Master Plan.⁹⁸ Thus the FAB technology plan is partly driven by and supporting SESAR, non-SESAR drivers (local and FAB specific needs) and the EATM plan. This illustrates how a multiplicity of factors must be taken into account in FAB planning.
- DANUBE FAB jointly plans its CNS infrastructure development and where possible conducts common procurement - this was one of the five priority projects detailed in the 2016 Annual plan.⁹⁹ None of these are concrete proposals to procure to a defined FAB technology roadmap.
- Both BULATSA and ROMATSA replaced their VCS system in 2015, which will become fully operational in 2016. This allows further discussions on the implementation of VoIP inter centre communications and possible cross border initiatives with Operational Personnel, utilizing common VCS system.¹⁰⁰
- An agreement has been reached to commonly procure a data-link solution for air ground.

The following procurement activities have been identified:

- The CAPEX programme for BULATSA includes a new ATM system in 2019, although the system is not scheduled to come into service until 2022. We note that this procurement has an exceptionally short 5-year depreciation period planned (ROMATSA is replacing their ATM System in 2015 with a planned depreciation a more typical 12 years).
- ROMATSA was able to avoid the purchase of one new radar covering the South-Western Romanian airspace since coverage and data sharing is available from a

⁹⁷ PRB Assessment of RP2 FAB Revised Performance Targets DANUBE FAB Version 3.1 - 16/10/2015

⁹⁸ PRB Assessment of RP2 FAB Revised Performance Targets DANUBE FAB Version 3.1 - 16/10/2015

⁹⁹ INFORMATION PROVIDED TO THE EUROPEAN COMMISSION ON THE ESTABLISHMENT OF THE DANUBE FAB-2012

¹⁰⁰ European ATM Master Plan Level 3 Report - Implementation View - 2015

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

BULATSA radar system. Additional contingency is available through sharing each other's AFTN services using the DANUBE FAB communication infrastructure in common¹⁰¹

- FAB reports notes one of the FAB difficulties is that they suffer from slow common procurement procedures due to national administrative requirements.¹⁰²

Rationalisation of support services

No plans for rationalisation of support services have been identified but we note that:

- There are no plans to integrate AIS; although the two services will be harmonised there will be two separate publications.
- For MET collaboration and harmonisation is planned but this will maintain two separate MET providers with separate databases and staffing.
- There is a project to investigate FAB based training provision but no plans.

Performance scheme

- Safety: the FAB targets submitted for RP2 are consistent with European wide target.
- Environmental: the FAB target for RP2 is consistent with European wide target.
- Capacity: the FAB has excellent capacity performance and existing capacity plans are expected to comfortably cope with the traffic demand over RP2 - despite not being consistent with the FAB reference values.
- Cost: Also consistent with European wide target.

2.4.4 Assessment of economic aspects

2.4.4.1 FAB CBA analysis

The CBA carried out for DANUBE FAB was developed in 2012¹⁰³. It comprised the timeframe 2008-2012. It indicates in summary:

- An NPV for the 2 ANSPs involved of € 15 million over 2008-2030.
- An NPV for airlines of € 522 million over the same time period.
 - 70% stemming from fuel savings
 - 26% of savings in the direct operating costs (as a result of time savings)
 - 3% from savings in CO2 rights.

These benefits are generated through five benefit initiatives:

¹⁰¹ DANUBE FAB CONCEPT OF OPERATIONS, Edt 3 - 05.12.2013

¹⁰² PRB Assessment of RP2 FAB Revised Performance Targets DANUBE FAB Version 3.1 - 16/10/2015

¹⁰³ ALG/Europraxis, 2012, Consulting services for the elaboration of Cost Benefit Analysis and the Business Case for the DANUBE FAB functional airspace block covering the airspace of the Republic of Bulgaria and the airspace of Romania

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

1. Airspace design & management and common operational concept: this will bring benefits in terms of ATCO productivity for ANSPs and flight efficiency to Airspace Users;
2. Harmonized training system: implying a reduction in the costs for ATCO initial training for both ANSPs;
3. Harmonized management systems for Safety, Quality, Security and Environment (SQSE): this will bring benefits in terms of staff productivity;
4. Common CNS strategy: enabling a rationalisation of the technical CNS infrastructure deployment on the whole DANUBE FAB territory, thus avoiding cost duplications;
5. Common procurement: closely related to the development of a common CNS strategy and bringing benefits thanks to economies of scale in the procurement of assets and services.

The third and fourth benefit initiative, harmonised management systems for SQSE and a common CNS strategy, were expected already to generate benefits to the ANSPs by 2012. For the other benefit initiatives it was expected that these benefits would accrue beyond 2018 or even later. The benefits for airlines were estimated to accrue to them from 2015 onwards.

In the response to the survey, the ANSPs in the FAB don't substantiate in detail the progress in capturing the above mentioned benefits compared to the CBA document. From the response regarding the individual measures taken, it can be derived that airspace users benefited from a first phase FRA concept, and from cross border sectorisation initiatives. Additionally, the first benefits for the ANSPs involved in common procurement were realised. It does not seem however, that the planned benefits from harmonised management systems for SQSE and the common CNS strategy did materialise as foreseen in the CBA.

2.4.4.2 Performance in cost-efficiency KPA (actual performance RP 1)

The performance in terms of cost efficiency during RP1 is provided in the following table. Cost efficiency was only reported on individual ANSP level during RP1. Data for 2015 (first year RP2) are not yet available. Values in red indicate the actual rate was higher than the target.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

	2012		2013		2014	
	Target	Actual	Target	Actual	Target	Actual
Bulgaria	€ 37.15	€ 33.68	€ 36.56	€ 32.21	€ 34.57	€ 27.05
Romania	€ 35.78	€ 40.44	€ 34.51	€ 35.02	€ 33.26	€ 32.16

Source: PRB monitoring reports

2.4.4.3 Unit costs RP 2, unit rates and charging zones

The following determined unit costs for RP 2 apply on FAB level, based on the FAB performance plan.

	2015	2016	2017	2018	2019
TSUs	6.181.308	6.357.019	6.534.852	6.717.155	6.925.753
Real en route UCs/DUCs (in €₂₀₁₂ prices)	36,76	35,31	33,96	32,72	31,48
Trend in real en route UCs/DUCs (in €₂₀₁₂ prices) %n/n-1	-6,86%	-3,94%	-3,83%	-3,65%	-3,78%
Real en route UCs/DUCs (in €₂₀₀₉ prices)	33,47	32,15	30,91	29,79	28,66
Trend in real en route UCs/DUCs (in €₂₀₀₉ prices) %n/n-1	-6,85%	-3,94%	-3,83%	-3,65%	-3,78%

Source: Danube FAB Performance Plan RP2

The unit rates of route charges applicable to December flights (in €, based on November 2016 exchange rates) for the FAB member states are as follows:

Romania:36.18

Bulgaria:22.68

The following charging zones apply:

- Number of en route charging zones: 2 (Bulgaria, Romania)
- Number of terminal charging zones: 2 (Bulgaria, Romania)

In the response to the ANSP level data collection questionnaire, the FAB indicated that "the *assessment* of common charging policies and FAB-wide or synthetic FAB unit rates is envisaged in the DANUBE FAB Strategic Program for RP2, but has not started yet. A key prerequisite for this process is the achievement of higher level of convergence

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

between the DANUBE FAB partners". The follow-up interview with DANUBE FAB shows that DANUBE FAB is currently not doing anything to achieve a common level charging zone. According to DANUBE FAB, no benefits are foreseen other than perhaps an administrative benefit to the airlines. Unless ANSPs are more integrated, there are no benefits.

2.4.4.4 Resource-efficiency measures in core services and support services

The ANSPs in the FAB indicate in their response to the ANSP level data collection questionnaire that they "are not aware of any criteria and related actions agreed with Member States in the context of the discussions at the Council of the EU on SES II+, concerning any of the items listed in the table below". As a result, it is referred to the different annual reports for any measures taken. However, the annual reports 2014 and 2015 don't indicate any concrete measures like the criteria and related actions as agreed at the Council.

Nevertheless, some measures as described in section 2.3.2 above have been taken:

- The first common procurement of VCS systems to deliver VoIP in 2014.
- Establishment of two cross border sectors per December 2014.

2.4.4.5 Conclusions on economic aspects of the FAB

The DANUBE FAB foresaw large economic benefits in the CBA. These have not materialised to full extent. However, judging from the implemented operational and technical projects, some benefits have been realised. It has not been possible to assess the costs and benefits in the light of reports published by the PRB and NM, as those reports provide no substantial basis on which this could be conducted.

The DANUBE FAB has incurred administrative costs to set up and run the FAB, but has not reported on these costs and these costs can therefore not be assessed.

In terms of technical harmonisation and rationalisation, DANUBE FAB has implemented Coordination for New Technology Deployment, Common CNS Infrastructure and Joint Procurement.

The introduction of FRA (cross border night FRA: SEEN FRA) is being undertaken in conjunction with Hungary. It has not become clear to the study team if the benefits of FRA can be attributed to the FAB initiative. FRA could have happened regardless of the FAB initiative.

2.5 DK-SE FAB

2.5.1 General information

The **Denmark-Sweden FAB (DK-SE FAB)** was established in December 2009. The FAB comprises the following constituents:

Table 7 SE-DK FAB overview

Member States	Air navigation service providers	National supervisory authorities
Denmark	Naviar	Danish Transport Authority - Trafikstyrelsen
Sweden	LFV	
NUAC ¹⁰⁴		Swedish Transport Agency - Transportstyrelsen

Figure 14 Geographic scope of the DK-SE FAB



The DK-SE FAB airspace covers the Copenhagen FIR and Sweden FIR. The designated air traffic service providers are Naviar and LFV, who have concluded an agreement with a certified subcontractor, NUAC HB, outsourcing the operation of their air traffic control centres (ATCCs) located in Copenhagen, Malmö and Stockholm.

Consequently, NUAC HB has been entrusted with the responsibility for the en route air traffic service provision within the DK-SE FAB. The ATCCs facilities and assets remain property of Naviar and LFV. NUAC employs 14 persons directly, while the other employees working at the ATCCs are on secondment from Naviar and LFV. NUAC HB is a partnership equally owned by Naviar and LFV.¹⁰⁵

MET services are provided separately, by DMI and SMHI as designated MET service providers for the FAB.

2.5.2 Institutional and legal arrangements

2.5.2.1 Legal basis

Agreements concluded at State, NSA, ANSP level underpin the implementation of the DK-SE FAB.

The State-level *Agreement for the establishment of the Danish-Swedish Functional Airspace Block* was signed on 17 December 2009. The NSA level Agreement was signed on 1st July 2010 and the ANSP level Agreement on 14 October 2009.

¹⁰⁴ NUAC (**N**ordic **U**nified **A**ir traffic **C**ontrol) is a joint subsidiary owned by Naviar and LFV.

¹⁰⁵ DK-SE RP2 FAB Performance Plan, p. 13; NUAC website (www.nuac.eu)

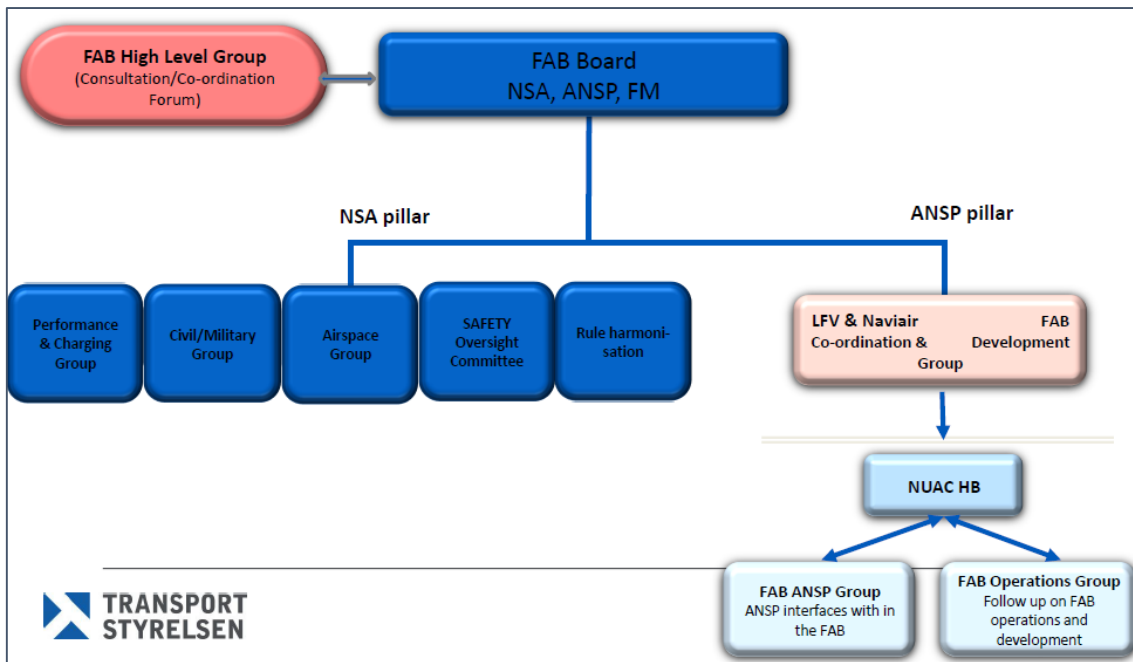
**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

2.5.2.2 Governance¹⁰⁶

The responsibility for the FAB governance has been delegated by the State Governments to the appointed Competent Authorities, namely the Danish Transport Authority (Trafikstyrelsen) and the Swedish Transport Authority (Transportstyrelsen). The Competent Authorities are jointly responsible for managing the FAB and performing the tasks spelled out in the FAB State-level Agreement.

The overall FAB governance structure is presented in the chart below:

Figure 15 Governance structure of the DK-SE FAB¹⁰⁷



The FAB Board is the highest decision-making body within the DK-SE FAB. The Board comprises one representative from each competent authority. Furthermore, each authority may bring experts and observers at its own discretion. The Board meets at least once every six months.

The FAB High-Level Group constitutes a consultation and coordination mechanism between the competent civil and military authorities and the relevant stakeholders on issues of common interest affecting the DK-SE FAB. The High-Level Group consists of representatives from the Competent Authorities, military authorities, Air Navigation Service Providers, and other stakeholders.

¹⁰⁶ Information sources: DK-SE State-level Agreement; DK-SE FAB response to ANSP-level data collection questionnaire; Rules of Procedure of the DK-SE FAB Board; Rules of Procedures of the DK-SE FAB High Level Group; Deliverable entitled "Additional, general information on the operational DK-SE FAB", Appendix VI (submission to the EC in relation to FAB establishment)

¹⁰⁷ Extracted from Transportstyrelsen's website

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The FAB Board has established five expert groups responsible for matters covering joint supervision and safety oversight, the harmonisation of rules, airspace aspects, civil-military coordination, as well as FAB performance planning and monitoring.

The Chairmanship of the FAB is changing every year between Denmark and Sweden. In even years Denmark is chairing the FAB Board and Sweden in uneven years.¹⁰⁸

LFV and Naviair are not part of the formal decision-making process of the FAB, but participate as observers on the meetings. The "ANSP pillar" of the FAB is built upon the NUAC HB – LFV and Naviair have established an ANSP-level FAB Coordination and Development Group (providing orientations to NUAC) as well as two technical sub-groups under the NUAC umbrella (FAB ANSP Group and FAB Operations Group).

2.5.2.3 NSA cooperation¹⁰⁹

The NSA agreement of 1st July 2010 underpins the cooperation between the Danish and Swedish NSAs. Concrete cooperation has been implemented in many areas related to the FAB.

With regard to ANS certification and oversight, the cooperation activities include:

- Joint certification (July 2012) and oversight of the common air traffic service provider, NUAC HB, incl. coordination, planning and conduct of audits;
- Oversight of service providers providing MET cross-border-services.
- Oversight of common ATS Training Organisation – Entry Point North, located in Sweden.

The coordination and exchange of safety-related information takes place in the framework of the Safety Oversight Working Group. The harmonisation of NSA procedures is pursued via the DK-SE FAB Board and the relevant working groups. There are no common qualification or training requirements for NSA inspectors.

Resource-sharing arrangements include the joint representation of FAB NSAs at international fora (one NSA representative attending on behalf of FAB). In addition, the FAB Board makes ad hoc decisions on the sharing of resources and expertise based on identified actual needs within each NSA.

Tasks relating to the DK-SE FAB Performance Plan are undertaken in the framework of the FAB "The Performance/Charging Group". In this respect, a joint consultation mechanism of stakeholders at FAB-level is in place, in accordance with article 9 of Commission Implementing Regulation 391/2013.

The identified main challenges regarding the NSA cooperation relate to differences in the national regulations and national military requirements.

¹⁰⁸ Rules of Procedure of the DK-SE FAB Board

¹⁰⁹ Information in this section is based on the DK-SE FAB response to the NSA level data questionnaire

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

2.5.2.4 **Customer engagement, stakeholder consultation and communication**

The DK-SE FAB has a formalised consultation mechanism of airspace users on FAB related aspects. The consultation takes place once a year.¹¹⁰

The NUAC HB has a webpage¹¹¹ summarising the key information relating to the service provision arrangements in the FAB context, but there are no FAB documents or news updates published on the site. General information on the FAB activities can also be found on the websites of the national ANSPs and CAAs.

2.5.2.5 **Social dialogue**¹¹²

The DK-SE FAB has a social dialogue mechanism performed on a quarterly basis within the NUAC company and managed by the NUAC CEO. There are regular meetings between the NUAC CEO, the NUAC HR Executive and trade union representatives from LFV (Sweden) and NAVIAIR (Denmark). Depending on the topics covered, other persons may also be invited to take part.

The overall objective is to present, discuss and take views on the strategic developments within the FAB, looking at the challenges and developments ahead. The FAB social dialogue also enables the sharing of information between participants on specific local issues experienced at national level.

It is necessary to note that only FAB-specific issues are addressed through the NUAC FAB Social Dialogue; the national issues continue to be discussed within LFV's and NAVIAIR's respective local structures and groups. National law regulates the national dialogue and communication.

2.5.2.6 **Inter-FAB cooperation and cooperation with Third countries**¹¹³

Enhanced cooperation has been established between the DK-SE FAB and NEFAB at all levels. Full seamless free route airspace has been implemented in the entire area covered by the two FABs, and this process has been facilitated by the NSAs.

Furthermore, the ANSPs of the DK-SE FAB are involved in a wide range of industrial partnership initiatives including:

- the Borealis Alliance¹¹⁴ which aims to foster ATM performance and achieve operational/financial efficiencies through joint activities, including the Borealis Free Route Airspace (FRA) programme;

¹¹⁰ DK-SE FAB response to ANSP-level data collection questionnaire

¹¹¹ NUAC website: <http://www.nuac.eu/page778.aspx>

¹¹² Information source: the DK-SE FAB response to the ANSP level data questionnaire

¹¹³ Information sources: DK-SE FAB response to the ANSP level data questionnaire and LSSIP Report Year 2015 Sweden

¹¹⁴ The Borealis member ANSPs are: Avinor (Norway), Finavia (Finland), Irish Aviation Authority (Ireland), Isavia (Iceland), Lennuliiklusteeninduse AS (Estonia), Latvijas Gaisa Satiksme (Latvia), LFV (Sweden), NATS (UK) and Naviair (Denmark)

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- the COOPANS Alliance¹¹⁵, in respect of ATM systems harmonisation, related common training and maintenance contracts;
- Entry Point North (EPN)¹¹⁶, in the field of ATM education and training;
- the “A6 Alliance”¹¹⁷ relating to the SESAR R&D phase and deployment phase.

2.5.3 Operational context and status

2.5.3.1 Overview of operational and technical elements

DK-SE FAB	
Geographic scope and traffic features	<ul style="list-style-type: none"> • Copenhagen and Sweden FIRs plus a delegation of ATS in the northern Baltic sea. • Sweden has 45% overflights, 35% international arr/dep and 20% domestic; Denmark has 49% overflights, 45% international arr/dep and 7% domestic (rounded to 1sf).
Number of States	<ul style="list-style-type: none"> • Two state FAB - Denmark and Sweden.
Scope of FAB service provision	<ul style="list-style-type: none"> • En-route ATS in the Copenhagen and Sweden FIRs provided separately by the two ANSPs through the NUAC structure, which includes ATM/CNS and AIS. • MET services are provided separately by the Danish Meteorological Institute (DMI) and Swedish Meteorological and Hydrological Institute (SMHI).
FAB Business/Implementation Plans	<ul style="list-style-type: none"> • 2007 business plan cited ~€13M of cost efficiency savings, mostly from the redesign of operational support functions (~€10M) and systems/technical cooperation (~€1M) in common procurement, shared infrastructure (ATM/CNS, training simulators).

¹¹⁵ The COOPANS alliance is established between the five ANSPs IAA (Ireland), LfV (Sweden), Naviar (Denmark), Austro Control (Austria) and Croatia Control (Croatia), with Thales as supplier and partner.

¹¹⁶ EPN is owned jointly by AVINOR, LfV and Naviar

¹¹⁷ The “A6 Alliance” includes ENAIRE, DFS, DSNA, ENAV, NATS, and NORACON, (the NORTH European and Austrian Consortium), which consists of nine members: Swedavia (Swedish airports) and eight European ANS providers: Austro Control (Austria), AVINOR (Norway), EANS (Estonia), Finavia (Finland), IAA (Ireland), ISAVIA (Iceland), LfV (Sweden) and Naviar (Denmark).

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

	<ul style="list-style-type: none"> • The FAB 2012 submission to the EC did not include an update to the business plan and there are no publicly available updates since. • Performance Plans are combined State plans rather than integrated FAB performance plan.
<p>Airspace configuration / ATFM</p>	<ul style="list-style-type: none"> • FRA has been implemented above FL285 since 2011, from which 54% of flights are now flying their optimum route through the FAB. • Flight efficiency ultimately limited by a number Swedish military areas. • There is reference to NUAC integrated flow management functions¹¹⁸ (at the tactical level) and close working with the Network Manager. • Cross border areas: implementation of Öresund TMA - including Copenhagen and Malmö TMA is planned for 2014-2016.
<p>Convergence of operational concepts and systems</p>	<ul style="list-style-type: none"> • Some development of Cross Border airspace • Planned redesign of operational support functions as indicated in the 2007 business case. • No joint contingency plans are evident.
<p>FAB integration for delivery of the new technology AND Rationalisation of systems and equipment</p>	<ul style="list-style-type: none"> • Strategy of technical systems harmonisation through COOPANS, which is cited as saving up to 30% on separate development costs. • Part of Borealis, which should have an impact on CNS and AIM as well as airspace but details TBD. • Planned common procurement, shared infrastructure (ATM/CNS, training simulators). • NORACON is a vehicle to support the FAB in respect of new SESAR technologies. This was set up in 2009 and also includes: Austro Control, Avinor, EANS, Finavia, IAA, ISAVIA and Swedavia. Its focus has been on SESAR projects, including those that further the interests of COOPANS and support the development of NUAC.
<p>Rationalisation of support services</p>	<ul style="list-style-type: none"> • Training is pooled through Entry Point North, which also contributes to revenues from commercial activity.

¹¹⁸ Appendix V. Supplementary information on the operational DK-SE FAB.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The DK-SE FAB operational highlights are:

- Naviair and LfV are part of the Borealis alliance, also including other North European ANSPs: Avinor, EANS, Finavia, IAA, ISAVIA, LSG and NATS. Borealis was set up in 2012 for the purpose of coordination and alignment in CNS, AIM and Free Route Airspace.
- The FAB implemented a Free Route Airspace above FL 285 in 2011, from which 54% of flights are now flying their optimum route through the FAB¹¹⁹.
- Implementation of a Common Transition Altitude within the DK-SE FAB from 2015 (at the earliest)¹²⁰.
- The NUAC Harmonisation Group, set up to make proposals on the harmonisation of operational concepts across the FAB units.
- There is a clear strategy, at three levels: individual ANSP initiatives, FAB initiatives, Industrial Partnerships.

2.5.3.2 Detailed review

Airspace configuration / ATFM

The FAB is bordered by the following FIRs/UIRs: Norway, Finland, Scottish, London, Amsterdam, Bremen, Hanover, Rhine, Warsaw, Vilnius, Riga, Tallinn and Kaliningrad. The air traffic service in two northern parts of the FIR over the Baltic Sea is delegated to Sweden. Despite this delegation, the FAB's borders are predominantly those of the States involved.

Convergence of operational concepts and systems

- The FAB is part of COOPANS¹²¹, a technical cooperation for the upgrade and harmonisation of the members' ATM Systems built with common software and with harmonised maintenance processes.

Rationalisation of support services

- Entry Point North is owned by Naviair, Avinor, IAA and LfV. It provides standardised and harmonised training for ATCO trainees, ATCOs and more recently ATSEP training for the maintenance of ATM and CNS equipment. The company serves the FAB as well as commercial services world-wide (20 countries).

¹¹⁹ PPT presentation "NUAC - Nordic Unified Air traffic Control – A successful partnership" http://ec.europa.eu/transport/sites/transport/files/modes/air/ses/ses-award/projects/doc/nuac_presentation.pdf

¹²⁰ Supplementary information on plans for Airspace development for the DK-SE FAB, cf. (EU) Regulation 176/2011, Art. 6.

¹²¹ Supplementary information on the operational DK-SE FAB Attachment to Appendix III - COOPANS CO-Operation of Air Navigation Service providers: IAA, LfV, Naviair, AustroControl and CroatiaControl.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- There is some planned redesign of operational support functions indicated in the 2007 business case.

Rationalisation of service provision

Whilst the creation of NUAC presents a single vehicle for the FAB, the FAB is still delivered through the two constituent ANSPs.

Performance scheme

- Safety: the FAB targets submitted for RP2 are consistent with European wide target.
- Environment. The target for horizontal flight efficiency (KEA) in 2015 was 1.2% and that achieved 1.18%¹²².
- Capacity. The capacity target in 2015 was 0.1 min that achieved 0.01min.
- Cost efficiency. The PRB's RP2 assessment report¹²³ has judged the cost efficiency of DK-SE FAB (submitted by States individually) to be consistent with the EU level targets.

2.5.4 Assessment of economic aspects

2.5.4.1 FAB CBA analysis

The FAB DK-SE CBA has been issued in 2008¹²⁴. In this study, the effects of an operational alliance between LFV and Naviair was assessed. In summary, the CBA results were as follows.

- Total initial investments 2006-2020: € 18.4 million
- Internal cost reductions (LFV/Naviair, NPV 2006-2020): € 72.6 million
- Total accumulated benefits 2011-2020: € 500 million
 - Airlines: 63% (stemming from time savings, valued with costs per flight hour. The document does not specify if the time savings stem from reduced delays or shorter routes)
 - Passengers: 27% (Stemming from time savings)
 - Environmental savings: 10% (stemming from reduced flight hours)

In the response to the survey, the ANSPs did not answer if the benefits foreseen in the CBA materialised. It has been indicated, see also 2.4.3., that FRA concepts have been implemented, but it is unclear if that resulted in any benefits yet. At the same time, DK-SE believes that industrial partnerships might take over the FABs in terms of bringing benefits to airspace users. An example of this is the NEFRA project with NEFAB. As for materialised benefits on ANSP level, the NUAC has proven itself in terms of achieving better performance of both Naviair and LFV ANSPs, but the benefits have not been quantified by DK-SE FAB yet. NUAC enabled to provide a service with less personnel.

¹²² PRB performance dashboard: http://www.eurocontrol.int/prudata/dashboard/rp2_2015.html.

¹²³ PRB Assessment Report of RP2 FAB Performance Plans – Volume 1 – Union-wide view

¹²⁴ Ramboll, 2008, NUAC programme Socio-economic analysis.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

Naviar and LFV expect to be able to reduce prices for en-route further between now and 2019. This is partly based on the costs reductions and activities of NUAC.

2.5.4.2 Performance in cost-efficiency KPA (actual performance RP 1)

The performance in terms of cost efficiency during RP1 is provided in the following table. Cost efficiency was only reported on individual ANSP level during RP1. Data for 2015 (first year RP2) are not yet available. Values in red indicate the actual rate was higher than the target.

	2012		2013		2014	
	Target	Actual	Target	Actual	Target	Actual
Denmark	€ 63.15	€ 63.18	€ 63.28	€ 59.15	€ 61.30	€ 57.17
Sweden	€ 56.20	€ 65.52	€ 54.26	€ 54.59	€ 51.98	€ 48.53

Source: PRB monitoring reports

2.5.4.3 Unit costs RP 2, unit rates and charging zones

The following determined unit costs for RP 2 apply on FAB level, based on the FAB performance plan.

	2015	2016	2017	2018	2019
TSUs	4.810.000	4.874.000	4.930.000	4.991.000	5.053.000
Real en route UCs/DUCs (in € 2012 prices)	65,11	63,24	61,42	59,64	57,63
Trend in real en route UCs/DUCs (in € 2012 prices) %n/n-1	-6,60%	-2,87%	-2,87%	-2,89%	-3,37%
Real en route UCs/DUCs (in € 2009 prices)	54,25	52,67	51,19	49,74	48,07
Trend in real en route UCs/DUCs (in € 2009 prices) %n/n-1	-6,33%	-2,92%	-2,82%	-2,83%	-3,36%

Source: DK-SE FAB Performance Plan RP2.

The unit rates of route charges applicable to December flights (in €, based on November 2016 exchange rates) for the FAB member states are as follows:

Denmark:61.93
 Sweden:58.96

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

There are two en route charging zones: Denmark and Sweden, as well as two terminal charging zones: Denmark Copenhagen and Sweden Arlanda.

DK-SE has analysed the possibility of a common level charging zone, based on the SDG report. The conclusion is that it would not bring any benefit in the case of the DK-SE FAB, as unit rates are very close to each other.

2.5.4.4 Resource-efficiency measures in core services and support services

The question on resource efficiency measures has not been answered in the ANSP level data collection questionnaire. However, the study team notes that there is a common procurement project ongoing, which is covered through COOPANS.

2.5.4.5 Conclusions on economic aspects of the FAB

The DK-SE FAB foresaw large economic benefits in the CBA. These have not materialised to full extent. However, judging from the implemented operational and technical projects, some benefits have been realised. It has not been possible to assess the costs and benefits in the light of reports published by the PRB and NM, as those reports provide no substantial basis on which this could be conducted.

The DK-SE FAB has incurred administrative costs to set up and run the FAB, but has not reported on these costs and these costs can therefore not be assessed.

In terms of technical harmonisation and rationalisation, the DK-SE FAB has implemented Harmonised Systems and Joint Training.

The DK-SE FAB has implemented FRA through the NEFRA/Borealis FRA programme. The DK-SE FAB is involved in the NEFRA project together with NEFAB. It has not become clear to the study team if the benefits of FRA can be attributed to the FAB initiative. FRA could have happened regardless of the FAB initiative.

2.6 FAB CE

2.6.1 General information

FAB CE (FAB Central Europe) was established in May 2011¹²⁵. The FAB comprises the following constituents:

Table 8 FAB CE overview

Member States	Air navigation service providers	National supervisory authorities
Austria	Austro Control	Federal Ministry of Transport, Innovation and Technology, Civil Aviation Authority of Austria
Bosnia and Herzegovina	BHANSА	Bosnia and Herzegovina Directorate of Civil Aviation
Croatia	Crocontrol	Croatian Civil Aviation Agency
Czech	ANS CR	Civil Aviation Authority of Czech Republic
Hungary	HungaroControl	National Transport Authority of the Republic of Hungary
Slovak Republic	LPS	Civil Aviation Authority of the Slovak Republic
Slovenia	Slovenia Control	Civil Aviation Agency of the Republic of Slovenia

The FAB legal scope differs between the FAB CE states and is defined in Annex 2 of the Agreement on the Establishment of FAB CE (the FAB CE Agreement)¹²⁶:

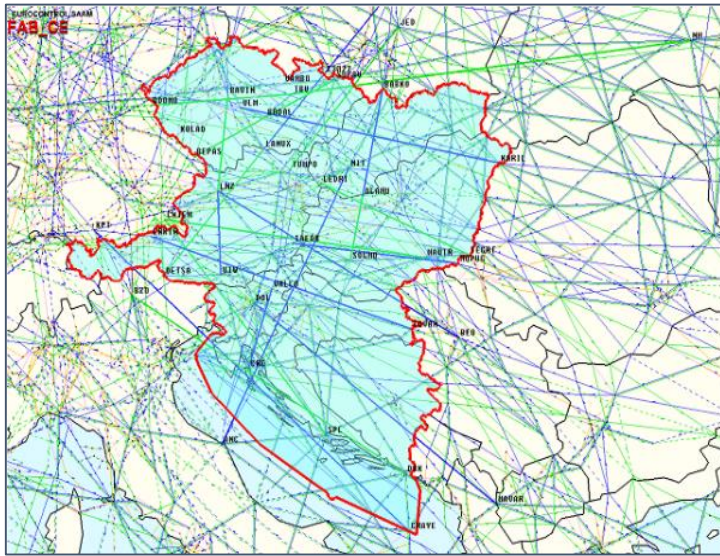
- Bosnia and Herzegovina, Croatia, Slovakia and Slovenia only included en route services (covering ATS, CNS, AIS, MET and SAR) in the scope of the FAB agreement;
- Austria, the Czech Republic and Hungary included all ANS services (covering ATS, CNS, AIS, MET and SAR) without limitations in the scope of the FAB agreement.

¹²⁵ FAB CE State Agreement, art. (2)

¹²⁶ FAB CE State Agreement, art. 20 and Annex 2

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Figure 16 Geographic scope of FAB CE



Pursuant to the FAB State-level Agreement, FAB CE covers the following airspace:

- FIR Vienna, GND - UNL;
- FIR Sarajevo, FL165 -UNL;
- FIR Zagreb, F205 – UNL;
- FIR Prague, GND – UNL;
- FIR Budapest, GND – UNL;
- FIR Bratislava, FL195 – UNL;
- FIR Ljubljana, FL175 – UNL.

It is hence visible that some of the FAB CE States did not include the lower part of the airspace in the scope of the FAB CE Agreement¹²⁷.

There are 63 control sectors within the FAB distributed over the following ACCs: ACC Bratislava; ACC Budapest; ACC Ljubljana; ACC Praha; ACC Sarajevo; ACC Vienna; ACC Zagreb.

2.6.2 Institutional and legal arrangements

2.6.2.1 Legal basis

FAB CE is built upon the following agreements concluded at State, NSA and ANSP level:

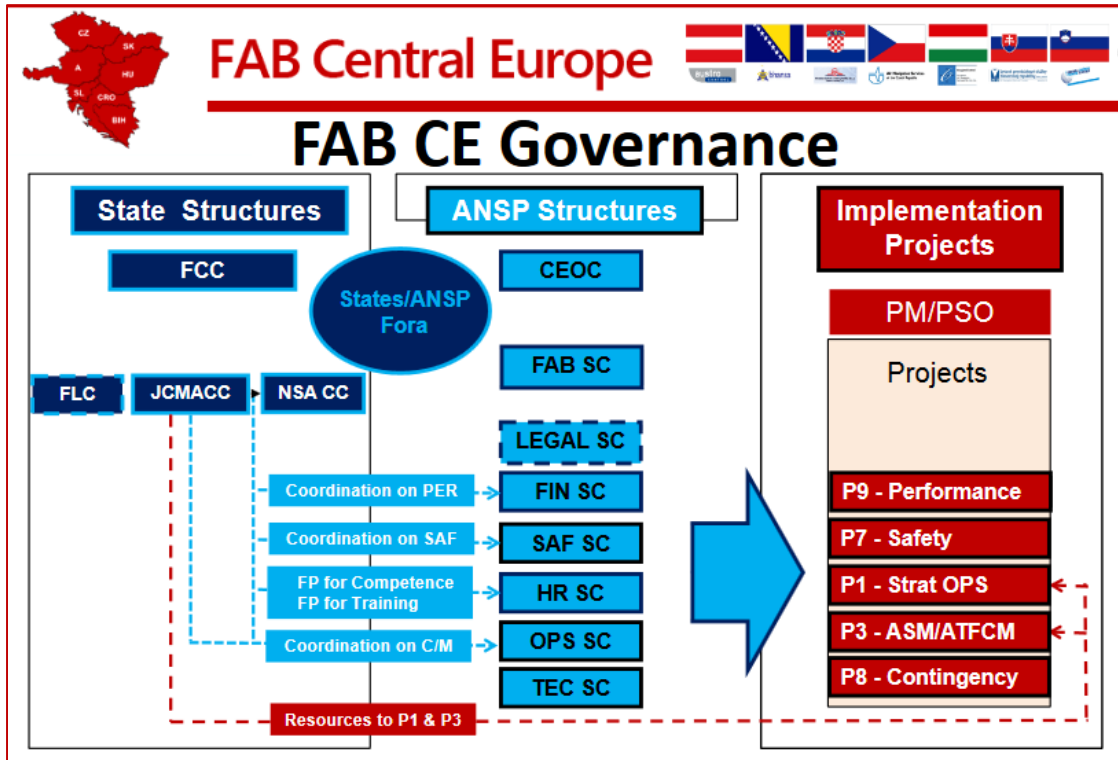
- *Agreement on the establishment of the Functional Airspace Block Central Europe* (signed 5th of May 2011);
- *National Supervisory Authorities Co-operation Agreement* (signed 30th of May 2011);
- *Cooperation Agreement of the FAB CE Air Navigation Service Providers* (signed 5th of May 2011);

¹²⁷ FAB CE State Agreement, Annex 1

2.6.2.2 Governance

The responsibility for the FAB CE governance has been organised on State and ANSP level. The figure below presents the FAB CE governance.

Figure 17 Governance structure of the FAB CE¹²⁸



In FAB CE, the highest joint decision-making body responsible for the implementation, operation and further development of the FAB is the FAB CE Council (FCC). The FAB CE Council is composed of representatives of the Contracting States and each FAB CE State has one vote. FAB CE State may appoint several delegates in order to allow interests of both civil and military aviation to be represented. The NSAs are taking part in the FCC as observers, as part of the State delegations. Each designated ANSP may participate as observer.

The FCC decision-making is based on the consensus principle. If consensus cannot be reached, the FAB CE Council shall adopt decisions and measures by voting in accordance with the rules defined in the FAB CE State Agreement. Accordingly, "decisions"¹²⁹ shall

¹²⁸ PPT presentation: FAB CE, Overall view, Consultation meeting with EC, 8th June 2012, Brussels <http://www.fab-ce.eu/images/pdf/Presentation/FLC%20presentation%20v1.0.pdf>

¹²⁹ "Decisions" cover, among other things, "the formulation and endorsement of FAB CE principles, objectives and policy at the strategic level" and the establishment of FAB bodies.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

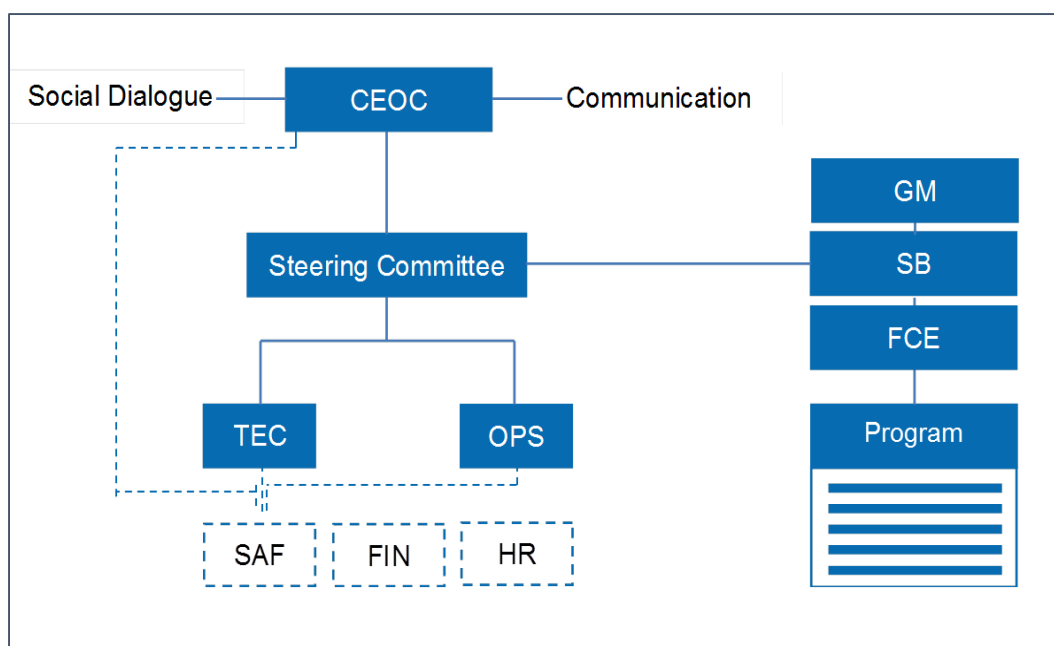
require the unanimity of votes, while "measures"¹³⁰ may be adopted by simple majority¹³¹.

Two Committees are supporting the FCC: the Joint Civil Military Airspace Coordination Committee (JCMACC) and National Supervisory Authorities Coordination Committee (NSA CC). The JCMACC covers the civil-military cooperation with respect to the FAB CE aiming at strategic coordination of national ASM and airspace design policies, ATFCM processes and civil-military cooperation of all FAB CE States¹³². The NSA CC is established to exercise the tasks outlined in the FAB CE and NSA Cooperation Agreements. Under the NSA CC, there is a number of working groups, such as:

- SOWG: safety audits, oversight, ongoing compliance
- CHWG: assessment of ATM changes / interoperability
- SRWG: safety reporting / safety directives
- HRWG: criteria for HR assessment / HR management / training
- LICWG: ATCO / ATSEP licensing
- PRWG: performance¹³³.

As regards the ANSP level structures, the overall organisational structure is depicted in the following figure.

Figure 18 ANSP level governance structure of FAB CE



¹³⁰ "Measures" cover, among things, the "endorsement of overall plans and measures related to the implementation, further development and operation of FAB CE", "contingency issues", the harmonisation of rules and the adoption of the FAB Performance Plan. However, the measures "shall be in line with already adopted decisions of the FAB CE Council".

¹³¹ FAB CE State Agreement, art. 7

¹³² FAB CE State Agreement, art. 8

¹³³ FAB CE State Agreement, art. (9)

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The CEO Committee (CEOC) represents the high level decision-making body at ANSP level responsible for taking all decisions necessary and appropriate for the attainment of the purpose of the ANSP cooperation. The CEOC membership consists of all ANSPs, each being represented by one authorised person. Ordinary meetings of CEOC takes place every three months. The CEOC resolutions may be adopted on a unanimity level ("Decisions") and simple majority level ("Measures").

Under the CEOC, the Steering Committee is a body responsible for the coordination and monitoring of the actual implementation of the ANSP cooperation¹³⁴. Sub-committees at executive/working level are responsible for executing the ANSP cooperation in particular fields. The following ANSP level sub-committees are in place:

- The Operational Sub-committee;
- The Financial Sub-committee;
- The Technical Sub-committee;
- The Safety Sub-committee;
- The Human Resources Sub-committee;
- The Training Sub-committee;
- Any other Sub-committee established by the CEO Committee¹³⁵.

As regards technical and administrative support, FAB CE is endowed with a joint legal entity responsible for managing and supporting the implementation of the FAB CE programme. FABCE Aviation Services, Ltd. ("FCE") has been formed as a limited company jointly owned by the FAB CE ANSPs (those of EU Member States). FCE started its operations in October 2014.¹³⁶

The main FCE activities are the following: administrative services, common procurement, organization of workshops, HR outsourcing and staffing services, operation management and maintenance of infrastructure, PR services, marketing and market research. The FCE provides a unique opportunity for FAB CE ANSPs to jointly manage projects and services via a single platform rather than acting independently.¹³⁷ The FABCE Legal Entity is also perceived as a key factor contributing to the success of the FAB by enabling regional cooperation to be fast tracked, and bringing the FAB management away from political factors.

The principles regarding the activities of the FABCE Legal Entity were formalised in the Framework Agreement for the provision of PMO and PSO Services concluded on 5th February 2015 and in the Agreement for the provision of the program management services concluded on 22nd April 2015, both among FAB CE ANSPs on one part and FCE on the other part.¹³⁸

¹³⁴ FAB CE ANSP Cooperation Agreement, art. (5.2)

¹³⁵ FAB CE ANSP Cooperation Agreement, art. (5.3)

¹³⁶ UPDATED INFORMATION ON FAB CE PROGRESS, November 2015 - April 2016 (Information note to the EC dated 1 April 2016).

¹³⁷ Memorandum of Association, FABCE Aviation Services, Ltd.

¹³⁸ UPDATED INFORMATION ON FAB CE PROGRESS, November 2015 - April 2016 (Information note to the EC dated 1 April 2016).

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

2.6.2.3 NSA cooperation

The FAB CE NSA Agreement, signed on 30th of May 2011¹³⁹ provides for cooperation arrangements in particular with regard to:

- harmonisation of national rules including respective procedures in the relevant areas;
- definition of procedures and conditions related to exercise of rights and obligations of the NSAs under the FAB CE Agreement;
- establishment of harmonized procedures for reporting, exchange and dissemination of safety-related information

NSA cooperation on the FAB CE level is organised through the NSA Coordination Committee (NSA CC) and associated working groups. The NSA cooperation is based on the following aspects:

- Harmonisation and coordination:
 - Harmonisation of national rules (harmonisation of national rules should ensure the gradual creation of the "Common Handbook of the FAB CE NSAs supervisory rules and procedures);
 - Coordination of the performance plans (covering the procedure by which the NSAs shall closely cooperate and coordinate their activities with respect to the Performance scheme framework);¹⁴⁰
- Supervision and safety oversight in FAB CE:
 - Applicable rules and procedures (covering procedures where certifying NSA shall ensure the notification of all rules and procedures to be applied by the ANSP providing the FAB CE service in the airspace falling under the responsibility of the territorial NSA);
 - ATCOs Unit endorsement for cross border sectors (covering rules and procedures on the issuance and mutual recognition of a Unit endorsement for the ATCOs of the ANSP operating within the cross-border sectors);
 - Inspection programmes and safety regulatory audit programmes (covers the national inspection programmes with the two years' time span, notification of the national inspection programme to the NSA CC, and NSA CC adaptation and coordination of the "Common Inspection Programme");
 - Inspections/audits and corrective actions (covering the procedures on the NSA inspection, review, survey or audit which affects operations in a cross-border sectors)
 - Safety oversight of changes to functional systems (covers the procedure of notifying the NSA CC on the all accepted new functional systems or changes to the existing functional ANSPs systems which are FAB CE related, and procedure on the notification of the safety arguments between the certifying and territorial NSAs);

¹³⁹ FAB CE NSA Cooperation Agreement, art. (2)

¹⁴⁰ FAB CE NSA Cooperation Agreement, art. (3-15)

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- Safety directives (Covering the procedure on the informing the NSA CC on any unsafe condition and issuance of the safety directive).
- Information
 - Exchange of the information (covering the procedure on the exchange of information between the FAB NSA structures);
 - Safety oversight reporting (procedure on how the NSAs should adopt and publish annually a "FAB CE Annual Safety oversight report");
 - Data repository (establishes Data repository in electronic for on FAB CE level);
 - Pool of experts (covering the NSA CC maintenance of the list of technical experts having expertise in different areas and utilization of the experts in the supervision tasks).

FAB CE has conducted at FAB level a NSA Human Resource Assessment ¹⁴¹ which covers the structure and size of NSA departments, task distribution and staffing levels, experience, competency and training of inspectors, inspector recruitment and qualification requirements and remuneration.

2.6.2.4 **Customer engagement, stakeholder consultation and communication**

FAB CE has a formalised consultation mechanism of airspace users and other stakeholders on the Performance Scheme related aspects¹⁴². There are no consultation mechanisms on FAB CE level concerning other aspects than the development of the FAB Performance Plan.

FAB CE has a webpage summarising the key information relating to the service provision arrangements in the FAB context¹⁴³. General information on the FAB activities can also be found on the websites of the national ANSPs and CAAs.

2.6.2.5 **Social dialogue**

FAB CE has established a formal Social Dialogue mechanism on the basis of the following two documents describing the related processes on the FAB level: the FAB CE *Social Dialogue Charter*¹⁴⁴ and *Protocol to amend the FAB CE Social Dialogue Charter*¹⁴⁵.

The *Social Dialogue Charter* defines the scope of the social dialogue and the partners involved. The Charter is signed by the ANSPs of FAB CE States and various social partners (i.e. national unions of ANSPs, including ATCOs, AIS and technical personnel, and State-level unions). In some cases, unions have signed the Charter as an alliance. Social Dialogue is carried out in accordance with the relevant EU Directives and Guidelines and is established at FAB CE level and should be reflected also at national level.

¹⁴¹ FAB CE NSA HR Assessment Report 2014, Edition Number:1.0, Edition Date: 10.02.2015

¹⁴² FAB CE Performance Plan RP2, Consultation process

¹⁴³ <http://www.fab-ce.eu>

¹⁴⁴ FAB CE Social Dialogue Charter

¹⁴⁵ Protocol to amend the FAB CE Social Dialogue Charter

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The scope of the social dialogue includes the provision of information and views on all FAB CE developments and issues, in particular focusing on those directly affecting employees, e.g.:

- Education, Training and Licensing;
- Work Organisation
- Safety and Just Culture
- Mobility of ANS staff
- Impact on/of Technology
- Social impacts on operational and technical changes
- Staffing issues, such as attracting and retaining staff, with the exception of national collective bargaining and wage negotiations, which shall not be subject to FAS CE Social Dialogue
- Impact on Human Factors

Parties in the Social Dialogue are¹⁴⁶:

- On the FAB employer side, the FAB ANSPs Management is represented by the FAB CE CEO Committee (CEOC);
- On the staff side the bodies representing the FAB CE staff as listed:
 - Danube ATCU;
 - FAB CE Unions Alliance;
 - FAB CE Alpe Adria Alliance.

Regular meetings of the Consultation Forum are held twice a year at minimum, in principle at the premises of one FAB member ANSP or TU. The meetings are co-chaired by CEOC and one representative of staff representing Parties. Where there is a need for consultation on specific issues of major importance, significantly affecting employees, which have to be addressed without undue delay, each Party may ask for an ad hoc meeting. The meeting should take place as soon as possible when such issue arises, in order not to impede or delay consultation.

The FAB CE ANSPs have a dedicated social dialogue focal point (appointed for one year), supported by a social dialogue coordinating team which includes representatives from all FAB CE ANSPs.

The Social Dialogue Forum (SDF) is co-chaired by the Chair of the FAB CE CEO Committee and a nominated social partner. It is attended by 50-70 participants including representatives from unions at a national level (including ATCOs, AIS and technical personnel) and representatives from ANSPs.

Face to face meetings are held at least once per year (usually twice). Workshop style meetings are also held, and teleconferences are used if necessary (e.g. for preparatory conversations). Written consultations are used for meeting preparation purposes ¹⁴⁷.

¹⁴⁶ Protocol to amend the FAB CE Social Dialogue Charter, art.(2)

¹⁴⁷ FAB CE ANSP data collection questionnaire response

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Two Social Dialogue forums were held, in May and November 2015, convening ANSP CEOs, the FAB CE program management, social partners and trade unions. Two major milestones were achieved at the Social Dialogue Forum: the Social Dialogue Charter was amended, paving the way for the FAB CE Alpe Adria Alliance to officially join the Social Dialogue; the second one is the signing of the ATCO Mobility Paper by the CEO Committee and the ATCO unions¹⁴⁸.

2.6.2.6 Inter-FAB cooperation and cooperation with Third countries

FAB CE has initiated a number of Inter-FAB cooperation arrangements, described as follows:

- GATE ONE strategic alliance - FAB CE is an active member of a group of ten countries comprising the region from the Baltic Sea to the Black Sea which on 6 November 2013 in Sofia signed a strategic cooperation agreement on establishing a regional cooperation platform. GATE ONE is covering the area of three functional airspace blocks (FAB CE, Danube FAB, Baltic FAB) with the goal of promoting the efficiency of European Air Traffic Management through an enhanced cooperation among the participating service providers.
- A letter of inter-FAB cooperation was signed by the member states of FAB CE and BLUE MED FAB (Cyprus, Greece, Italy and Malta) on 3 September 2014 in order to endeavour to implement safer, more cost-efficient and sustainable ANS with increased emphasis on performance.
- An agreement at ANSP level between DANUBE FAB and FAB CE was signed on 14 October 2015 with the aim of establishing and enhancing cooperation in ATM in the two adjacent FABs.
- On 2 and 3 May 2016 an information exchange between the operations managers of the functional airspace blocks FAB CE, FABEC, BALTIC FAB, BLUE MED, DANUBE, UK-IRELAND, NEFAB and the SW FAB took place on the premises of DFS in Langen, Germany.

In addition, there are numerous bilateral cooperation of the FAB CE members with their neighbouring countries, inter-alia:

- South Eastern Europe Night Free Route Airspace (in a programme called SEEN FRA): Cross border Night FRA project between the States of Hungary, Romania and Bulgaria bridging the airspace between the two Functional Airspace Blocks of FAB CE and DANUBE FAB by spring 2017
- Croatia Control is actively implementing FRA (in a programme called SEAFRA) together with SMATSA and BHANSA. Slovenian- Austrian cross-border free route airspace (SAXFRA) was launched in November 2015 as a result of cooperation between Austro Control and Slovenia Control.
- DFS and Austro Control implemented a new method to exchange flight data that increases the accuracy and timeliness of the data displayed on the radar screens

¹⁴⁸ FAB CE ANSP data collection questionnaire response

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

in both the Karlsruhe and Vienna control centres. This activity is currently specific and bilateral, but may be extended to the rest of the FAB.

- the COOPANS Alliance, in respect of ATM systems harmonisation, related common training and maintenance contracts. The COOPANS alliance is established between the five ANSPs IAA (Ireland), LFV (Sweden), Naviair (Denmark), Austro Control (Austria) and Croatia Control (Croatia), with Thales as supplier and partner.

2.6.3 Operational context and status

2.6.3.1 Overview of operational and technical elements

FAB CE comprises 7 Area Control Centres (ACCs) in 7 States: Czech Republic, Slovak Republic, Austria, Hungary, Croatia, Slovenia, Bosnia and Herzegovina. The respective ANSPs provide ATS, CNS systems, AIS and SAR (Austro Control, BHANSA, Croatia Control, ANS CR, Hungarocontrol, LPS SR, Slovenia Control). The scope of service of the FAB is En-route; they not currently include TMA or Aerodrome beyond where they may have common procedure or technology projects, e.g. WAM or PBN. There are no plans for ACC consolidation. The FABCE approach is to develop an environment characterised by cross-border airspace design and extensive cross-border sectorisation, using cross sector logical sector groups over the FIR boundaries.

The FAB CE Strategy 2016-2020 was finalized and approved in June 2014, driven by a need to move towards seamless operations in a way that ensures safe and efficient operations¹⁴⁹. The document describes the environment in which FAB CE is being developed and defines strategic objectives and targets in order to meet the SES performance requirements. The four priority areas are: Performance, Safety, and Free Route Airspace and EU targets. The strategy is built on the concept of Regional Partnership, which is set as the primary concept of the strategy. The Industrial Partnership is viewed as opportunity of using the existing structure and tools of FAB CE by its members.

The National Supervisory Authorities Coordination Committee produce the FABCE Annual safety oversight report for the purpose to documenting the FABCE safety oversight process activities and results conducted by the National NSAs within FABCE.

FAB CE	
Geographic scope and traffic features	<ul style="list-style-type: none"> • There are 63 control sectors and 7 Area Control Centres (ACCs) in 7 states: Czech Republic, Slovak Republic, Austria, Hungary, Croatia, Slovenia, Bosnia and Herzegovina.

¹⁴⁹ FAB CE ANSPs Strategy 2016-2020, Document drafted by the SC Strategy task force February 2016

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

	<ul style="list-style-type: none"> Traffic is mostly overflights, as follows: Austria 72% overflights, Croatia 85%, Czech Republic 80%, Hungary 85%, Slovak Republic 94%, Slovenia 92%.
Number of States	<ul style="list-style-type: none"> Seven state FAB - Czech Republic, Slovak Republic, Austria, Hungary, Croatia, Slovenia, Bosnia and Herzegovina
Scope of FAB service provision	<ul style="list-style-type: none"> En route ATM - note that the 7 states have specified 5 different altitudes as the floor for applicable airspace. ATS, CNS, AIS, SAR, MET are provided in FIRs of Austria, Czech Republic, Hungary. ¹⁵⁰
FAB Business/Implementation Plans	<ul style="list-style-type: none"> None identified
Airspace configuration / ATFM	<ul style="list-style-type: none"> FAB CE actively engaged with the Network Manager in airspace optimisation - a number of activities coordinated at FAB level including FRA implementation and development of FAB level NOP. Environment – Flight efficiency - The target for horizontal flight efficiency (KEA) in 2015 was 1.94% and that achieved 1.94%¹⁵¹. The capacity target in 2015 was 0.29 min that achieved 0.04 min
Convergence of operational concepts and systems	<ul style="list-style-type: none"> Deliverable P14_D9 Train the Trainers Concept (approved in May 2014) harmonizing the training of the trainers’ was implemented
FAB integration for delivery of the new technology AND Rationalisation of systems and equipment	<ul style="list-style-type: none"> the ANSPs cross-border network (X-bone) is operationally used as of 2013 by the ANSPs of Austria, Croatia, Czech Republic, Hungary and Slovakia for exchange of surveillance data, OLDI and AMHS. <ul style="list-style-type: none"> Further extension to Slovenia is currently in progress and extension is planned to Bosnia and Herzegovina

¹⁵⁰ Agreement on the establishment of FAB-CE, May 2011, http://www.fab-ce.eu/images/pdf/fabce_agreement_signed.pdf, available on 13/10/2016

¹⁵¹ PRB performance dashboard: http://www.eurocontrol.int/prudata/dashboard/rp2_2015.html.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

	<ul style="list-style-type: none"> ○ X-bone has been identified as a common FAB CE project and common procurement of network equipment is being prepared to be published by FCE in 2016.¹⁵²
Rationalisation of support services	<ul style="list-style-type: none"> • None identified

FAB CE operational highlights are:

- Since 2014 the FAB has implemented some direct routes and elements of FRA.
- Joint safety activities are common safety surveys and safety assessment of FAB CE changes, carried out in accordance with the FAB CE Safety Management Manual. There are Letters of Agreement (LoAs) on sharing of safety management information since 2015 (TBC) and a FAB CE Safety Policy is in place.
- Trials of STAM have been held in coordination with the Network Manager. This activity is a future FAB level ATFCM to be implemented during 2017. The concept's processes and procedures were validated through the simulation. A high-level coordination by FABCE is in place. There are no concerns about revenue shifting as traffic flows itself do not shift so much.

The study has also observed:

- The FAB has made 3 common procurements, the first of which was in January 2016 for the FCE Programme Support Office, providing technical, administrative, and project management services to FABCE. Evaluation on possible joint procurement is conducted annually by collecting data on equipment plans for next 5 years and consolidating them. The aim is to procure as much as possible jointly¹⁵³.
- The FAB expresses a view that a prerequisite for more consolidation of service position is to have harmonised and even common systems but the cost of replacing systems in the middle of lifecycle would far outweigh any benefits.
- An Inter-FAB Cooperation Agreement at ANSP level was signed in 2015 between DANUBE FAB and FAB CE.
- The three neighbouring FABs (FAB CE, Baltic FAB, and Danube FAB) who make up the GATE One (GO) initiative proposed a study to synchronize cross-border Free Route Airspace (FRA) implementation across their regions, creating an umbrella regional free route airspace project.
- Long range cross-border direct route options(LRD), establishing 11 long range cross border direct route options (LRDs), which should have come into in

¹⁵² Attachment: Updated information on progress achieved

¹⁵³ FABCE interview 25/11/2016.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

February 2016 (ANSPs - SMATSA, Croatia Control, Slovenia Control, BHANSA and BULATSA).

- A project (FAB CE P15) to identify how the Single Unit Rate or other modification to the charging mechanism can support Free Route Airspace implementation from the point of view of the revenue distribution and capacity utilization of FABCE ANSPs was frozen in 2015. However, as there is a strong will to continue, the project had been transferred to a steering committee, which analysed common charging (6 scenarios)¹⁵⁴.
- A project (FAB CE P14) on the rationalisation of training facilities was initiated to define and fully harmonise the training of ATCOs, AMC/FMP Staff and ATSEP based on the Common Competence Schemes defined by project FAB CE P13. The project P14 has been frozen since 2015 whilst FABCE partners were waiting for the new regulation, which will help bring synchronization.
- A project (FAB CE P13) on the Competence Scheme was frozen, but a major reorganization of FAB programme and strategy took place in 2015. As a result, ATCO and ATSEP common competence activity continues as well as HR committee supported by PSO. Currently the FABCE HR Subcommittee is evaluating a common generic competency. Part of this activity is also to create a common pool of questions to evaluate the students.
- The FCE Programme Support Office are providing support for several FCE projects. Among these, implementation of Free Route Airspace (FRA) is a mandatory requirement for the Single European Sky and one of the priority programmes for FCE.
- The FABCE Technical Subcommittee has produced a cost containment study and considering how to synchronise development plans. Initial plans are to have a common pool of spare parts and maintenance services.
- In terms of ATM systems, the FABCE includes 2 COOPANS partners, 3 Thales customers, one Indra customer and one state with own solutions. Therefore, joint procurement, pooling spare parts or having a joint maintenance is currently not possible. But a possible change is foreseen in later years.
- A recognised cooperation issue is when ANSPs are competitors, however the only area now of competition is in training.¹⁵⁵

2.6.3.2 Detailed review

Airspace configuration / ATFM

The FAB-CE airspace comprises of 7 FIRs in seven states. Their vertical boundaries differ across all partners. Those reaching from ground to unlimited level are: FIR Vienna, FIR Budapest, FIR Prague. Those with different vertical levels are following: FIR Sarajevo

¹⁵⁴ FABCE interview 25/11/16.

¹⁵⁵ FABCE interview 25/11/16.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

(FL165-UNLIMITED), FIR Zagreb (FL205-UNLIMITED), FIR Ljubljana (FL175-UNLIMITED), FIR Bratislava (FL195-UNLIMITED).

- User requirements have been defined for the implementation of an integrated ASM/ATFCM process at FAB level.

Convergence of operational concepts and systems

Implementation of the cross-border Free Route Airspace (FRA) was launched in November 2015 as a result of cooperation between Austro Control and Slovenia Control, embracing the two areas of responsibility (Vienna and Ljubljana). The Slovenian Austrian cross-border free route airspace (SAXFRA) project will be the first cross-border free route airspace without vertical or time-based restrictions and is due to be implemented on 10 November 2016.

Joint FAB initiatives have been more difficult to pursue due to differing stages of lifecycle. Although some functionalities have been deployed in a coordinated way, this is a long term objective. A prerequisite for more consolidation of service position is to have harmonised and even common systems but the cost of replacing systems in the middle of lifecycle would far outweigh any benefits.

Rationalisation of systems and equipment

Common guidelines have been adopted on the financial conditions of surveillance data sharing to encourage sharing instead of investing in new surveillance sensors, bringing significant financial benefits.

The cost of replacing systems in the middle of lifecycle would far outweigh any benefits. This issue is resolved by some FAB CE ANSPs which have a closer cooperation also through other vehicles, i.e. Austria and Croatia cooperating very closely on development of the shared ATM system under the COOPANS industrial partnership.

Rationalisation of support services

FABCE Aviation Services, Ltd has been set up as a common outsourcing platform for FAB CE ANSPs and programme management for the FAB. Under this company FAB CE launched a pilot project for the common procurement of equipment. The project covers hardware upgrade of the regional cross-border telecommunications network (X-bone) that is deployed by the FABCE member states. The programme will lay down the procedural foundations for further common FABCE technical procurement activities.

Harmonized training of trainers' concept in place and being implemented, allowing for pooling of experts, mobility and contributing to reduction of FAB CE ANSPs' expenses.

Performance scheme¹⁵⁶

- Safety: the FAB targets submitted for RP2 are consistent with European wide target.

¹⁵⁶ PRU Dashboard – RP2 - http://www.eurocontrol.int/prudata/dashboard/rp2_2015.html

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- Environmental: Flight efficiency - The target for horizontal flight efficiency (KEA) in 2015 was 1.99% and that achieved 1.91%.
- Capacity: En-route ATFM delay per flight - The target for en-route ATFM delay in 2015 was 0.29min per flight and that achieved 0.21min per flight.
- Cost: The PRB's RP2 assessment report judged the cost efficiency of FAB to be consistent with the EU level targets apart from Austria and Slovakia.

2.6.4 Assessment of economic aspects

2.6.4.1 FAB CBA analysis

The CBA for FAB CE was conducted in 2008¹⁵⁷.

The CBA quantifies benefits indirect to users, through ANSP cost savings, including 1) savings in ATCO employment costs and 2) other ANSP cost savings including technical opportunities, and common training and qualification of personnel. The document also quantifies benefits direct to users through quality of service, including 1) delay, 2) horizontal flight efficiency through operational initiatives and 3) horizontal flight efficiency through the single unit rate. Net benefits differ per FAB option, but would be positive in all three cases in 2012. By 2025, net benefits would range between €110m; €140m and €132m.

Benefits indirect to users

In the 2008 CBA, FAB CE expects ATCO productivity and capacity to grow due to operational initiatives. Most costs benefits are foreseen by serving the traffic with fewer ATCOs. The value of the reduced number of ATCO-hours in the Static case (Option 1) compared to the reference case is €4.7m in 2015, rising to €5.8m in 2020. It falls slightly in subsequent years, to €5.4m in 2025. This is because the increased productivity in this period is used to reduce delays rather than to reduce costs. The Dynamic "Big Bang" case (Option 2a) has no incremental ATCO savings over Option 1 until 2021, after which the incremental savings rise to around €1.3m in 2025. For the Dynamic gradual case (Option 2b), there are no incremental ATCO savings over Option 1 until 2017, and these rise to €2.1m in 2020, and €2.3m in 2025.

Benefits direct to users

For delay benefits, FAB CE have focused on en route ATFM delays. FAB CE value the costs for delay at €57 a minute. These arise from ANSPs' cost savings. FAB CE have also estimated the benefits to airlines of reducing the amount of delay generated in the FAB CE region.

FAB CE have valued improved horizontal flight efficiency using the same assumptions and parameters as the Eurocontrol Performance Review Unit (PRU). This would lead to a value of, on average, €5 per km saved. The benefits from improvements in flight efficiency were foreseen to materialize in 2012 (€0.6m), to €6.5m in 2015 with

¹⁵⁷ FAB Central Europe Cost Benefit Analysis, 2008, FABCE/FIN/3.5/001 edition 01.01.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

implementation of static cooperation, and to €9.7m in 2025. These benefits arise primarily from the optimisation of the FAB route network, through improved airspace design, and from improved civil-military coordination of ASM.

The benefits and costs would result in the following NPV, per FAB implementation option:

Static				NPV = €308.5m
	Direct benefits (PV)	Indirect benefits (PV)	Costs (PV)	NPV
2015	€24.1m	€24.2m	€24.7m	€23.6m
2020	€85.9m	€70.6m	€32.5m	€124.0m
2025	€237.7m	€109.9m	€39.0m	€308.5m
Dynamic “Big Bang” (Incremental values over Static are shown below)				NPV = €342.3m
2020	€0m	€0m	+€16.7m	-€16.7m
2025	+€48.2m	+€3.3m	+€17.8m	€33.8m
Dynamic “gradual” (Incremental values over Static are shown below)				NPV = €333.4m
2020	+€5.1m	+€3.4m	+€18.8m	-€10.3m
2025	+€35.2m	+€9.3m	+€19.7m	+€24.9m

Table 6-2: Present values of benefits and costs

In response to the survey, FAB CE indicates that in both RP1 and 2015 the targets for en route horizontal flight efficiency were met and exceeded. In 2015 this was by 0.04%. FAB CE attributes this to increased DCT and Free Route implementations within the FAB, according to the Free Route Implementation Roadmap. As for benefits regarding delay reductions, FAB CE indicates that in both RP1 and 2015 the FAB CE targets for capacity were met and exceeded. In 2015 the en route capacity target was exceeded by 0.08 minutes. The target was mainly achieved because of the changes introduced in the sectorisation plan and in the rostering scheme. Cost savings/ benefits regarding lowering costs of service provision have not materialised in FAB CE. This would require more significant consolidation of service provision functions which on their turn require introduction of for example common ATM systems. FAB CE indicates that this is only possible in the longer term as ANSPs are not at the same stage when it comes to changing systems.

On other benefits, most FAB CE projects have been focused on delivering benefits to airspace users and not the ANSPs directly. Having said that, FAB CE has undertaken a few projects which have driven cost-efficiency for ANSPs in terms of joint procurement, sharing expert resources and setting up a common entity.

The CBA expected that the net benefits would appear in 2012. It can be seen that the expected net benefits have not been seen (yet). FAB CE indicates that overall the costs have so far heavily outweighed the benefits.

2.6.4.2 Performance in cost-efficiency KPA (actual performance RP 1)

The performance in terms of cost efficiency during RP1 is provided in the following table. Cost efficiency was only reported on individual ANSP level during RP1. Data for 2015 (first year RP2) are not yet available. Values in red indicate the actual rate was higher than the target. Data for Bosnia-Herzegovina and Croatia are not available from the PRB Monitoring Reports. An explanation for this is that Bosnia-Herzegovina is not a EU Member State and Croatia has only been an EU Member State since 2013.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

	2012		2013		2014	
	Target	Actual	Target	Actual	Target	Actual
Austria	€ 64.48	€ 66.17	€ 63.45	€ 66.37	€ 60.10	€ 60.31
Czech Republic	€ 41.72	€ 40.08	€ 41.31	€ 40.21	€ 40.80	€ 41.27
Hungary	€ 38.74	€ 37.78	€ 39.44	€ 36.78	€ 38.40	€ 31.79
Slovakia	€ 56.51	€ 56.25	€ 55.45	€ 53.35	€ 53.12	€ 51.73
Slovenia	€ 67.26	€ 61.36	€ 65.37	€ 65.83	€ 60.30	€ 59.95

2.6.4.3 Unit costs RP 2, unit rates and charging zones

The following determined unit costs for RP 2 apply on FAB level, based on the FAB performance plan¹⁵⁸.

	2015	2016	2017	2018	2019
TSUs	10,571,159	10,875,750	11,160,639	11,437,977	11,774,860
Real en route UCs/DUCs (in € 2012 prices)	52.99	51.56	49.91	48.47	46.74
Trend in real en route UCs/DUCs (in € 2012 prices) %n/n-1	-4.03%	-2.70%	-3.21%	-2.87%	-3.57%
Real en route UCs/DUCs (in € 2009 prices)	48.57	47.25	45.73	44.41	42.83
Trend in real en route UCs/DUCs (in € 2009 prices) %n/n-1	-4.04%	-2.71%	-3.22%	-2.89%	-3.56%

The unit rates of route charges applicable to December flights (in €, based on November 2016 exchange rates) for the FAB member states are as follows:

Austria:73.72

Bosnia-Herzegovina:42.04

¹⁵⁸ FAB CE Performance Plan RP2

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Croatia:47.85
Czech Republic:43.07
Hungary:35.32
Slovakia:52.63
Slovenia:65.47

Charging zones:

- en route charging zones: 6 (Austria; Croatia; Czech Republic; Hungary; Slovakia; Slovenia)
- terminal charging zones: 6 (Austria; Croatia; Czech Republic; Hungary; Slovakia; Slovenia)

Regarding a common charging zone, FAB CE stated that it has decided to maintain the individual charging zones, although FAB CE have looked into the possibility of a single charging zone. It seems that the difficulty of reimbursing charging between states, especially when traffic changes from year to year, holds back FAB CE. ANSP charging project was transferred to a steering committee, which presented six scenarios for common charging. This will be taken up in 2017.

2.6.4.4 Resource-efficiency measures in core services and support services

The study team asked in the ANSP level data collection questionnaire to which extent resource efficiency measures have been undertaken in the frame of FAB CE. FAB CE indicated the following:

Resource-efficiency measure		Performed/Planned activities	Results/Achievements	Performance contribution per KPA	
				RP1	RP2
✓	Joint training and training infrastructure of ANS personnel	Project 14 'Training and Training Facilities' focusing on creation of harmonized training practices and training package for: ATCOs, AMC/FMP personnel and ATSEP, in line with Common Competency Schemes. The activities continue under the responsibility of the HR Subcommittee.	Common ATCO/AMC/FMP competence schemes, harmonised training courses. A more intense cooperation of the FAB CE ANSPs in the training domain is to some extent inhibited by existence of several training organisations that have each also their own commercial objectives and are in fact competitors on the ANS staff training market.	SAF: CAP: ENV: COE: Low	SAF: CAP: ENV: COE: Low

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

	Resource-efficiency measure	Performed/Planned activities	Results/Achievements	Performance contribution per KPA	
			Nevertheless, the FAB CE still sees the cooperation in the training domain as a priority and it is reflected in the FAB CE Strategy.		
✓	Joint procurement	FCE established as a common outsourcing platform already in 2014 and it became fully operational in 2015.	1st successful common procurement of PSO completed Ongoing 2 nd common procurement under FAB CE Project 17 in order to upgrade its communication network X-Bone through FCE. Lessons learnt from these first common procurements will be later used for even more ambitious projects which should further unlock potential cost savings	SAF: CAP: ENV: COE: No	SAF: CAP: ENV: COE: High
✓	Joint maintenance	Coordination of maintenance ongoing under the responsibility of TEC Subcommittee Project 18 focusing on surveillance infrastructure optimisation has been recently initiated by the TEC Subcommittee. Project 18 started to develop processes for coordinated infrastructure planning and maintenance,	Coordination of maintenance is ongoing. Joint maintenance not yet possible until several legal pre-requisites, identified within the CNS Cost-containment study, as in place.	SAF: CAP: ENV: COE: No	SAF: CAP: ENV: COE: Low

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Resource-efficiency measure	Performed/Planned activities	Results/Achievements	Performance contribution per KPA	
	<p>thus leading to a proactive consultation process and a FAB CE-wide information exchange regarding SUR systems for increased cost-effectiveness.</p>			
<p>✓ Synchronised life cycles of technical ATM systems</p>	<p>This is a long-term objective. Replacing systems in the middle of lifecycle would far outweigh any benefits. Some FAB CE ANSPs have a closer cooperation also through other vehicles, e.g. Austria and Croatia cooperate very closely on development of the shared ATM system under the COOPANS industrial partnership.</p>	<p>Austria and Croatia have the same ATM systems (achieved through their partnership in COOPANS)</p>	<p>SAF: CAP: No ENV: COE: No/High (COOPANS)</p>	<p>SAF: CAP: Medium ENV: COE: Low/High (COOPANS)</p>
<p>✓ Harmonised ATM systems and tools</p>	<p>See above Project 4 'FMTP implementation completed Project 11 'ACID implementation' completed Common planning and joint projects stemming from DP/PCP identified</p>	<p>Some functionalities have been already deployed in a coordinated way (FMTP, ACID) Additional ATM functionalities will be coordinated through identified joint projects stemming from DP/PCP</p>	<p>SAF: CAP: ENV: COE: Low</p>	<p>SAF: CAP: Medium ENV: COE: Medium</p>
<p>Rationalised capex which</p>	<p>This is a long-term objective. Replacing</p>		<p>SAF:</p>	<p>SAF:</p>

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Resource-efficiency measure		Performed/Planned activities	Results/Achievements	Performance contribution per KPA	
	addresses long-term ATM development	systems in the middle of lifecycle would far outweigh any benefits. Some FAB CE ANSPs have a closer cooperation also through other vehicles, e.g. Austria and Croatia cooperate very closely on development of the shared ATM system under the COOPANS industrial partnership.		CAP: ENV: COE: High (COOPANS)	CAP: ENV: COE: High (COOPANS)
✓	Coordination of ANSPs' investment plans	Active role of TEC Subcommittee	The investment plans are being coordinated through an active discussion and planning coordinated by the TEC Subcommittee	SAF: CAP: ENV: COE: No	SAF: CAP: ENV: COE: Low
✓	Common CNS infrastructure developments	Active role of TEC Subcommittee Project 17 Project 18		SAF: CAP: ENV: COE:	SAF: CAP: ENV: COE: Low
✓	Cross-border service provision or cross-border delegation of ANS	FAB CE ANSPs already delegate parts of the airspace in the border area. A prerequisite for more consolidation of service position is to have harmonised and even common systems but the cost of replacing systems in the middle of lifecycle would far outweigh any benefits.	Parts of the ANSPs' airspace already delegated in the optimised way. Airspace planning is synchronised through the annual updates of the FAB CE Airspace Plan	SAF: CAP: Low ENV: Low COE: Low	SAF: CAP: Medium ENV: High COE: Medium

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

	Resource-efficiency measure	Performed/Planned activities	Results/Achievements	Performance contribution per KPA	
✓	Coordinated AIS provision	Common requirements for AIS data defined Common planning and joint projects related to SWIM stemming from DP/PCP identified	Common requirements for AIS data defined	SAF: CAP: ENV: COE:	SAF: CAP: ENV: COE: Medium

2.6.4.5 Conclusions on economic aspects of the FAB

FAB CE foresaw large economic benefits in the CBA. These have not materialised to full extent. However, judging from the implemented operational and technical projects, some benefits have been realised. It has not been possible to assess the costs and benefits in the light of reports published by the PRB and NM, as those reports provide no substantial basis on which this could be conducted.

FAB CE has incurred administrative costs to set up and run the FAB, but has not reported on these costs and these costs can therefore not be assessed.

In terms of technical harmonisation and rationalisation, FAB CE has implemented Harmonised Systems, Joint Training and Joint Procurement.

FAB CE has since 2014 implemented some direct routes and elements of FRA. It is also involved in FRA initiatives with neighbouring countries, such as the SEEN FRA with DANUBE FAB. It has not become clear to the study team if the benefits of FRA can be attributed to the FAB initiative. FRA could have happened regardless of the FAB initiative.

2.7 FABEC

2.7.1 General information

FABEC (Functional Airspace Block Europe Central) covers the lower and upper airspace of Belgium, France, Germany, Luxembourg, the Netherlands and Switzerland. The State-level Agreement establishing FABEC was signed in December 2010.

The table below shows the constituents of FABEC:

Table 9 FABEC overview

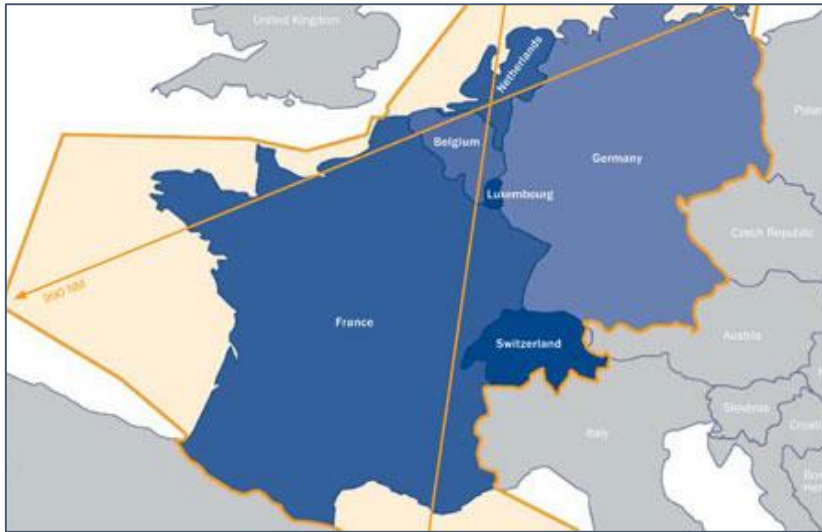
Member States	(Civil) Air navigation service providers	(Civil) National supervisory authorities
Belgium	Belgocontrol	Belgian Supervisory Authority for Air Navigation Services (BSA-ANS)
France	Direction des services de la Navigation aérienne (DSNA)	Direction du Transport Aérien (DTA)
Germany	DFS Deutsche Flugsicherung GmbH	Bundesaufsichtsamt für Flugsicherung
Luxembourg	Administration de la Navigation aérienne (ANA)	Direction de l'Aviation Civile
Netherlands	Luchtverkeersleiding Nederland (LVNL)	Ministry of Infrastructure and the Environment
Switzerland	Skyguide	Federal Office of Civil Aviation (FOCA)
	EUROCONTROL Maastricht Upper Area Control Centre (MUAC)	

The FABEC airspace is situated in the core area of the European ANS network. The geographic scope of FABEC covers an area of 1.7 million km², and encapsulates the following flight information regions (FIRs) and upper flight information regions (UIRs): FIR Bremen, FIR Langen, FIR München, UIR Hannover UIR Rhein, FIR/UIR Bruxelles, FIR Bordeaux, FIR Brest, FIR Marseille, FIR Paris, FIR Reims, UIR France, FIR Amsterdam, and FIR/UIR Switzerland.¹⁵⁹

¹⁵⁹ FABEC State-level Agreement, art. 3(1); FABEC website

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

Figure 19 Geographic scope of FABEC



The FABEC FIRs are among the busiest and most complex in the world. Most of the large European airports are also located in this area. The FAB handles 55% of European air traffic.

There are a number of minor cross border delegations in the

FABEC area which have been in place for many years, although many were not formalised prior to SES.

Relative to other FAB, overflight and international arrivals and departures dominate movements - together these account for over 90% of movements in most FABEC states (the overflights approximately 50% / International terminating traffic approximately 40%).

2.7.2 Institutional and legal arrangements

2.7.2.1 Legal basis

The legal foundation of FABEC is composed of the following legal instruments at State, NSA and ANSP levels:

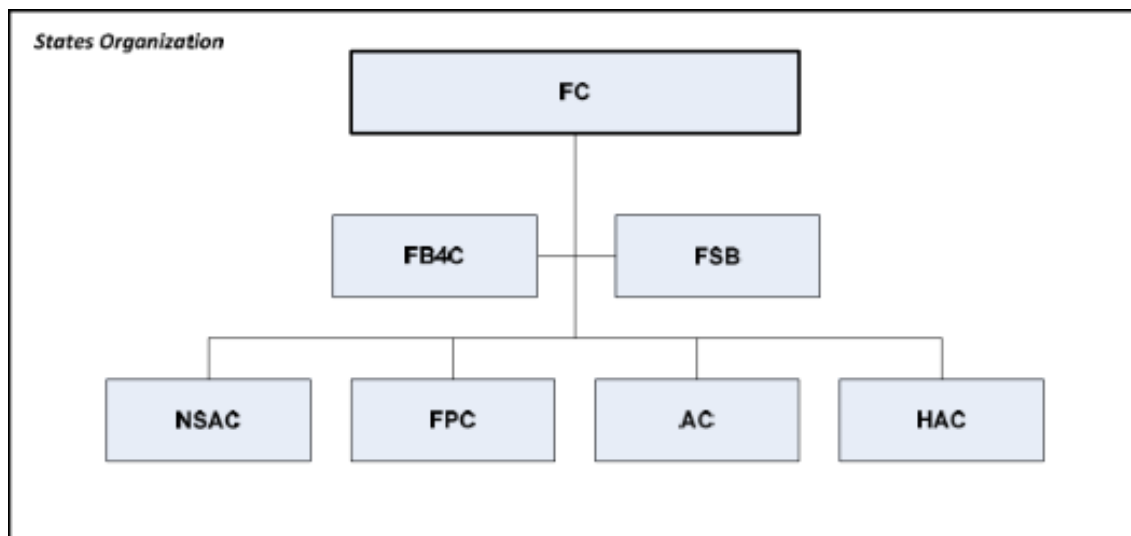
- State-level: *Treaty relating to the Establishment of the Functional Airspace Block "Europe Central" between the Federal Republic of Germany, the Kingdom of Belgium, the French Republic, the Grand Duchy of Luxembourg, the Kingdom of the Netherlands and the Swiss Confederation*, signed on 2 December 2010;
- NSA-level: *Memorandum of Cooperation between FABEC NSAs*, signed in February 2011;
- ANSP-level: *Cooperation agreement for the implementation and operation of FABEC between Belgocontrol, DFS Deutsche Flugischerung GmbH, Direction des Services de la Navigation Aérienne (DSNA), Luchtverkeersleiding Nederland, Administration de la navigation aérienne (Luxembourg), Skyguide Swiss civil and military Air Navigation Services Ltd and EUROCONTROL*, initially signed on 18 November 2008.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

2.7.2.2 Governance¹⁶⁰

The overall FABEC State-level institutional structure is depicted in the chart below:

Figure 20 FABEC State-level institutional structure



The FABEC Council (FC) is responsible for the governance and decision-making of the FAB. Each State is represented at the FABEC Council by one representative from the authority responsible for civil aviation, and one representative from the authority responsible for military aviation. All FABEC Council decisions have to be unanimously approved. The FABEC Council convenes at least twice a year.

Four States Committees are assisting the FABEC Council:

- the National Supervisory Authorities Committee (NSAC);
- the Finance & Performance Committee (FPC);
- the Airspace Committee (AC); and
- the Harmonisation and Advisory Committee (HAC).

The Committees are composed of civil and military experts appointed by the States. The Committees may be empowered by the FABEC Council to make decisions on its behalf in their respective domains of competence.

The activities of the FABEC Council and States Committees are supported by two bodies:

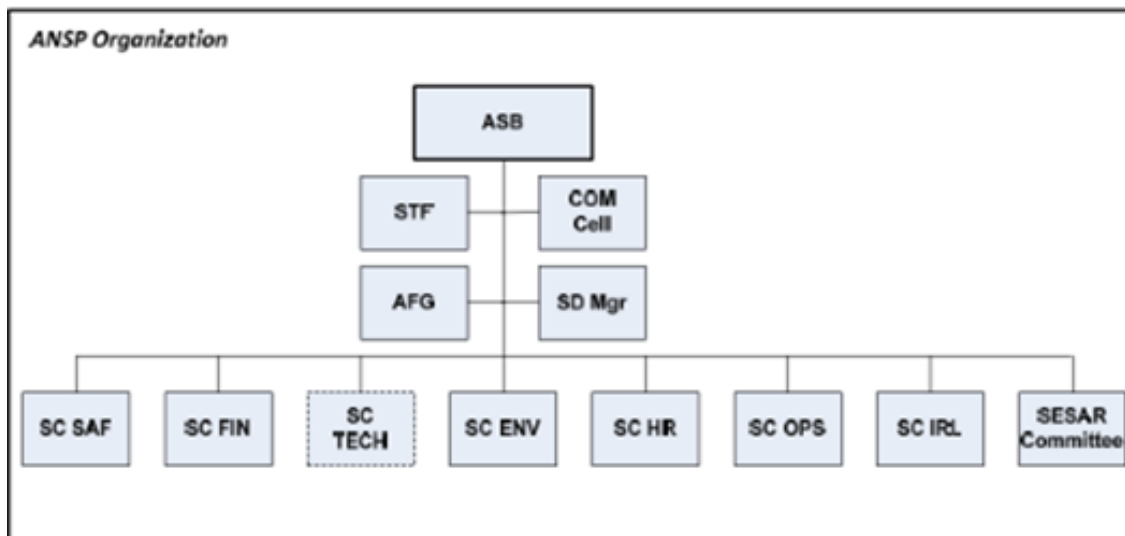
- the FABEC States Bureau (FSB), which supports the work and decision-making of the FABEC Council and the Committees;
- the FABEC Bureau – 4 Committees (FB4C), which is an informal body ensuring the coordination between the Committees' chairs and preparing FABEC Council meetings.

In parallel with the State-level organisation, FABEC is endowed with the ANSP-level structure pictured the chart below:

¹⁶⁰ Information sources: FABEC State-level Agreement and on the FABEC Programme Plan (Edition 2016).

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

Figure 21 FABEC ANSP-level institutional structure

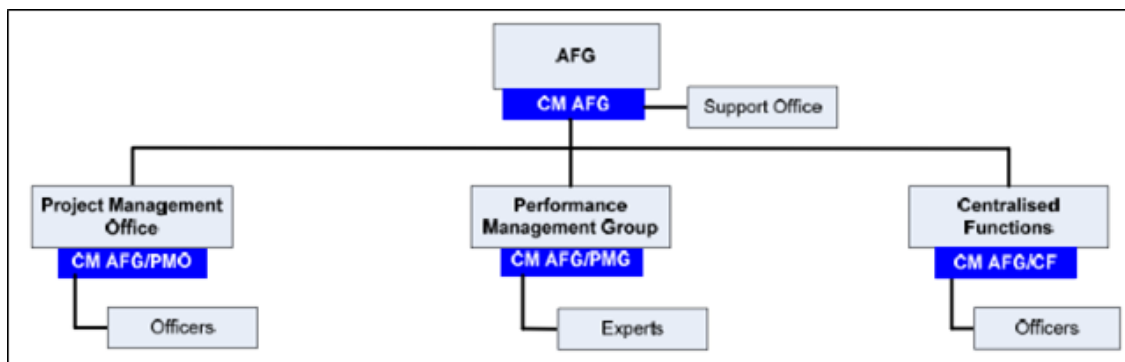


FABEC ANSPs cooperate under the auspices of the ANSP Strategic Board (ASB), composed of the CEOs of the FABEC Civil ANSPs, together with their military counterparts. The FABEC Council and the ASB hold joint meetings in the framework of the ANSCB, the Air Navigation Services Consultative Board.

The ASB is supported by a number of committees and task forces. It is important to highlight the role of the ANSP FABEC Group (AFG), which comprises a team of FABEC staff providing technical support, and ensuring coordination as well as exchange of information. The AFG is responsible, among other things, for project management.

The AFG is organised under three pillars, as presented in the chart below:

Figure 22 ANSP FABEC Group (AFG) - organisation



2.7.2.3 NSA cooperation¹⁶¹

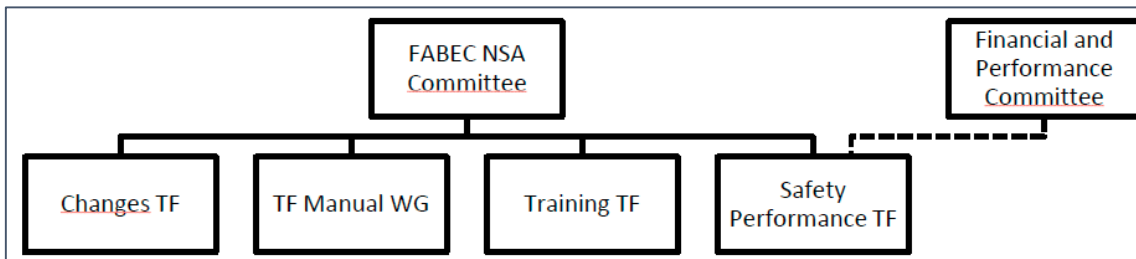
The Memorandum of Cooperation (MoC) signed in February 2011 between FABEC NSAs spells out the key principles and areas regarding NSA cooperation within FABEC. The main platform for NSA cooperation is the NSA Committee (NSAC), operating under the

¹⁶¹ Information sources: FABEC Programme Plan (Edition 2016) and the Memorandum of Cooperation between FABEC NSAs.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

FABEC Council and supported by several sub-committees and task forces, as highlighted below:

Figure 23 FABEC NSA Committee, associated working groups and task forces



The NSAC has developed a *Manual for the Common Activities of the FABEC NSAs*, which sets out methodologies and procedures facilitating and harmonising the NSA work at FABEC level. This manual is a living document including, among other things, the oversight procedures to be applied by the NSAs in case of cross-border and/or multi-State service provision in the FAB context. The manual is a first step towards the harmonisation of the national audit processes and the exchange of audit personnel within FABEC.

The NSAC has also set up a procedure regarding the review of the safety-related changes related to FABEC implementation. This procedure ensures the consistent review and safety assessment by NSAs of the FABEC changes to be applied by the ANSPs.

With regard to the FAB performance planning and monitoring tasks, the NSAC is responsible for the safety performance aspects, whilst the Financial and Performance Committee is managing the other key performance areas and the overall FABEC coordination on performance. Furthermore, the NSAC has established a dedicated task force liaising with ANSP-level structures concerning the performance scheme domain.

Within the next years, FABEC NSAs plan to further develop their cooperation as regards the certification and monitoring of training organisations and the approval of training plans.

2.7.2.4 Customer engagement, stakeholder consultation and communication
162

FABEC has established a formalised mechanism for the involvement and consultation of airspace users. This is based on a solution agreed in November 2014 between FABEC and airspace users (represented by IATA and AEA), which includes contacts at 3 levels:

- High-level meetings organised by the FABEC presidency (next Annual FABEC States-IATA/AEA meeting scheduled for November 2016);
- Expert meetings, e.g. on financial arrangements related to airspace design projects;

¹⁶² Information sources: FABEC Programme Plan (Edition 2016) and the FABEC website (section "airspace users").

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- Meetings upon request of the airspace users with the FABEC States Bureau and Chair AFG to ensure a better understanding of the desired involvement of airspace users in FABEC (the latest meeting was held in Zurich in October 2015).

Every second year, FABEC runs a Customer Survey in order to analyse customer satisfaction with and in FABEC. The survey is conducted using different means of communication (phone, webpage, templates). An Action Plan is initiated based on the results of the survey, in order to address the identified issues. The latest customer survey cycle has been performed in late 2015 (qualitative part) and 2016 (qualitative part).

The FABEC website¹⁶³ provides a comprehensive overview of the FAB background, objectives and activities. Regular news updates are published. Some basic FAB documents (incl. the RP2 FAB Performance Plan) are published on the website – however, some other key documents such as the FAB Implementation Plan or annual reports are not published.

2.7.2.5 Social dialogue¹⁶⁴

FABEC has a formalised and structured social dialogue framework.

FABEC ANSPs have appointed a Social Dialogue Manager who has overall responsibility for managing the social dialogue activities within FABEC. The FABEC Social Dialogue Framework includes three layers of interaction:

- The first layer is the Social Dialogue Committee (SDC) which meets at least two times per year. The SDC provides the high level, formal framework for the discussion on ongoing FABEC developments.
- The second layer includes meetings between ANSP experts, the relevant Chair of the standing committees and social partners. The second layer meetings are held on an ad hoc basis to address specific matters or areas topics raised by either the ANSPs or the social partners.
- On a third layer, meetings are held on ad-hoc basis in case of issues and concerns raised in the first and second layer meetings, requiring further discussion and comprehension. These meetings aim to strengthen, enhance and develop the social dialogue process.

FABEC considers that "*efficient and structured social dialogue is a key contributor to the successful implementation and operation*" of the FAB. The FABEC Social Dialogue Framework is based on the principle that staff representatives are regularly informed about the FABEC developments and their probable impacts, and are given the opportunity to actively bring suggestions and influence decision-making.

FABEC social dialogue activities are complementary to the existing national procedures: each ANSP also conducts regular social dialogue processes with their relevant staff representatives at national level, in parallel with FABEC level activities.

¹⁶³ FABEC website: http://www.fabec.eu/fabec_homepage/en/

¹⁶⁴ Information sources: FABEC Programme Plan (Edition 2016), FABEC website (section "social dialogue"), Terms of Reference of FABEC SDC, contained in "Consultation of Staff Representative Bodies, EC Information, Annex K" (submission to the EC in relation to FAB establishment)

2.7.2.6 Inter-FAB cooperation and cooperation with Third countries ¹⁶⁵

FABEC has been active in promoting inter-FAB cooperation on an EU-wide basis. FABEC took the initiative of organising the first Inter-FAB coordination workshop which brought together the State representatives of all nine FABs in Amsterdam in November 2014. This was found to be a useful informal platform for the exchange of information and the sharing of lessons learnt, and was subsequently followed by a second workshop organised by the DANUBE FAB in 2015.

Further to the aforementioned State-driven inter-FAB cooperation process, FABEC has also organised an ANSP-driven OPS inter-FAB event in May 2016 in Langen.

Operational and technical cooperation initiatives are ongoing with the SW FAB, FABCE and the UK-IRL FAB.

2.7.3 Operational context and status

2.7.3.1 Overview of operational and technical elements

FABEC	
Geographic scope and traffic features	<ul style="list-style-type: none"> • Handles about 5.5 million flights per year – 55% of European air traffic. • Large geographic area with homogenous high density traffic. • Has major airport hubs thus providing service to meet needs of international arrival and departure very important • Approximately 40% of en-route traffic is international terminating flights, a further 50% is over flight traffic.
Number of States	<ul style="list-style-type: none"> • Six states. Belgium, France, Germany, Luxembourg, The Netherlands and Switzerland. MUAC is also a member.
Scope of FAB service provision	<ul style="list-style-type: none"> • All ANSP provide all ATS - CNS ATM + AIS - but do not provide MET [with exception of Belgium]. • They provide the CNS systems, AIS, MET or SAR but not essential they do. FABs do not currently include TMA or Aerodrome - beyond where the procedure or technology has impact for multiple services such as WAM or PBN.

¹⁶⁵ Information sources: FABEC Programme Plan, Edition 2016 and FABEC website (section "inter-FAB cooperation" and "media releases")

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

<p>FAB Business/Implementation Plans</p>	<ul style="list-style-type: none"> • A FAB with FAB plans which are publicly available and current. • FABEC has extensive documentation of plans including assessment of economic impact using NPV. Its plans strongly reflect SESAR and PCP requirements.
<p>Airspace configuration / ATFM</p>	<ul style="list-style-type: none"> • FABEC has a preference for ATFCM and ASM as a FAB based network function. • FABEC has implemented a large number of new direct routes (DCTs) across FABEC airspace, some in collaboration with states outside FABEC. • The FAB has undertaken a large number of projects to validate concepts with the objective of improved traffic flow.
<p>Convergence of operational concepts and systems</p>	<ul style="list-style-type: none"> • No actions or plans for integration of core service provision, extensive cross border service provision, ACC consolidation - beyond that currently existing with MUAC. • In terms of concepts, as defined by SESAR and European ATM Master Plan.
<p>FAB integration for delivery of the new technology AND Rationalisation of systems and equipment</p>	<ul style="list-style-type: none"> • In terms of convergence of systems this is the expressed intent recorded in the FAB agreement. There is no evidence of it being put into effect. • FAB plans embrace concepts, as defined by SESAR and European ATM Master Plan. • Sharing of radar data has allowed for retirement of some radar which would otherwise have been replaced. • FABEC claim a long list of projects as FAB projects on the basis that in that they are establishing proof of concept for later deployment in the FAB.
<p>Rationalisation of support services</p>	<ul style="list-style-type: none"> • Sharing of information by way of FAB manuals for training and Safety Management. • There is no rationalisation of provider entities for training, for AIS (beyond EAD), MET, or systems maintenance.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The FABEC operational highlights are:

There are a large number of delegations in the FABEC area. In order to achieve a harmonized approach to formalisation of these, the FABEC a multilateral agreement, which was signed by all FABEC ANSPs on 18 March 2013, covers all rights and obligations between the ANSPs with respect to these delegations. This multilateral agreement is amended by bilateral annexes, which address the specific cross-border situation between the parties.

Operational plans are strongly integrated with European ATM Master Plan (Level 3), with PCP, with NOP, with SESAR.

The FABEC Strategy includes a significant number of airspace projects and initiatives directed at improving the Network Performance. The airspace strategy is based on a common FABEC OPS concept featuring

- Free Route Airspace
- Transition Airspace around the five major airports (Paris, Frankfurt, Amsterdam, London and Munich);
- Fixed Route Airspace dealing mainly with evolving traffic from/to FABEC airports, or airports close to FABEC airspace, in the most efficient way whilst optimising the use of the lower airspace to improve arrival and departure routes.

The FABEC XMAN Extended Arrival management implementation is designed for optimisation of traffic flows in and out of the major hubs in and close to the FABEC area. The programme is jointly planned and implemented with the UK/IRL FAB.

Free Route is seen as a cornerstone to improve FABEC Airspace structure and Airspace utilisation. 331 DCTs were implemented in 2015 within the FABEC airspace, reducing the distance flown by 400,000NM, which results in a gain of € 3,750,000 for the users¹⁶⁶.

The study has also observed:

The FAB project list needs to be viewed with caution and in that many projects are cited as FAB projects on the basis that in that they are establishing proof of concept for later deployment in the FAB. Whether these are FAB or state projects is open to debate.

Many projects feature FAB members rather than being FAB wide initiatives. FRA is FAB wide by other projects are ANSP, sector or airport specific. These tend to focus on optimising the use of the lower airspace to improve arrival and departure routes. FABEC is unique in having a strong focus extending beyond En route to TMA and airport operations.

The FAB has no plans for rationalisation of ACC, use of dynamic sectorisation or virtual centres.

Most FABEC members have a past history of cooperative management in the form of MUAC - thus the concept behind the FAB is not new to them and the procedures for

¹⁶⁶ FABEC Programme Plan edition 2016 V1.1

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

delegation are known. However, the MUAC model has not been adopted for wider application within the FAB.

FAB members are extensively involved in industry partnerships, which are not FAB related, to pursue developments outside the FAB. These are a less formal, more commercial arrangements, with some funded by TEN_T, superseding or supplementing the FAB model.

2.7.3.2 Detailed review

Airspace configuration / ATFM

- FABEC ATFCM/ASM Project (FAAP) (2013-2016) implementation of a FABEC ASM function which will rely on CDM only, AMC responsibilities remaining as they currently are. This project will contribute and follow the general initiative to establish common principles of ASM for FABEC countries.^{167 168}
- FABEC ATFM function still under consideration.

In the first nine months of 2015, 240 new direct routes (DCTs) were implemented across FABEC airspace as part of the FABEC Free Route Airspace Project. Overall, FABEC air navigation service providers have set up a network of 1,365 direct routings since 2010. The FABEC Free Route Airspace Project is a major contribution to complying with the EU's Pilot Common Project Regulation No.716/2014 that aims to, among other things, deploy a direct route network by 2018.¹⁶⁹ Convergence of operational concepts and systems

- A large number of projects undertaken to validate concepts to improve traffic flow. Most don't involve all states but are proof of concept for later deployment. Example of it is the XMAN (Cross-centre/Extended arrival management) project. This was implemented between London-Heathrow and UAC Maastricht, Reims ACC and Brest ACC and, on 28 April 2016, between Munich and UAC Karlsruhe. Munich: Vienna ACC has been in operation since 2010. The objective is to optimise arrival flows by managing the speed of aircraft already in the airspace of adjacent control centres¹⁷⁰
- Free Route as one of the cornerstones to improve FABEC Airspace structure and Airspace utilisation. 331 DCTs implemented in 2015 within the FABEC airspace, reducing the distance flown by 400,000 NM, which results in a gain of € 3,750,000 for the users¹⁷¹
- No consideration of rationalisation of ACC, use of dynamic sectorisation or virtual centres.

¹⁶⁷ FABEC ATFCM/ASM Project (FAAP) (2013-2016)

¹⁶⁸ FABEC Programme Plan edition 2016 V1.1

¹⁶⁹ FABEC - Free Route: Flight efficiency versus capacity – some considerations. Presentation to interFAB Workshop Operations, 2-3 May, Frankfurt/Langen, Germany.

¹⁷⁰ FABEC Programme Plan edition 2016 V1.1

¹⁷¹ FABEC Programme Plan edition 2016 V1.1

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Rationalisation of systems and equipment

- The FABEC States have committed in the FABEC State Treaty to the convergence of ATM systems and the cost-effective deployment of technical infrastructure and services.¹⁷² To date there is no evidence of joint procurement of ATM systems.
- FABEC members focus on SESAR ensures an effective FABEC coordination and timely common FABEC positioning, while maintaining an oversight of SESAR matters at FABEC level.¹⁷³
- Common VCS specifications are used by MUAC, DSNA and DFS and will be used for any future Call for Tender (CFT) within FABEC.¹⁷⁴ The project is ongoing, resulting in joint procurement of N-VCS for DSNA and MUAC. MUAC N-VCS enters operations in December 2016. The project is approximately 50% complete with planned ending in 2020. Total benefits are estimated to 5.1M €.
- Radar: An in-depth analysis of the civil and military radar surveillance infrastructure was performed to identify savings by sharing of surveillance data between FABEC ANSPs and also military ANSPs. The result of this analysis was that more than 10 radars could be saved on short term. 4 radars have been decommissioned and 10 are planned not to be replaced at their end-of-life.¹⁷⁵ The project is ongoing, but currently on hold due to different groups using the radars. However, 10 civil radars will not be replaced (5 PSR, 5 SSR), and 4 military radars will not be replaced (2 PSR, 2 SSR).
- As with Operations, in the technical domain there are a long list of projects involving a single state listed as FAB projects, justified on the basis that in that they are establishing proof of concept for later deployment in the FAB.
- Aside from procurement of consulting services for FABEC, there is no evidence of joint procurement of any significance.

Rationalisation of support services

- A FAB approach to supervision of initial training for ATCOs has been developed with a Manual which deals with the certification and monitoring of training organisation and approval of training plans, a FABEC training course and mutual recognition of student licenses.
- There is a harmonised FABEC Safety Management System.
- There is no rationalisation of provider entities for training, for AIS (beyond EAD), MET, or systems maintenance.

¹⁷² FABEC Programme Plan edition 2016 V1.1

¹⁷³ FABEC Programme Plan edition 2016 V1.1

¹⁷⁴ FABEC Programme Plan edition 2016 V1.1

¹⁷⁵ FABEC Programme Plan edition 2016 V1.1

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Performance scheme

RP2 performance target exist but are, in reality, no more than a combination of the individual member state plans.

- Safety: the FAB targets submitted for RP2 are consistent with European wide target.
- Environmental: the FAB target for RP2 is consistent with European wide target.
- Capacity: Since 2011, despite repeated requests to ensure that the FABEC ANSPs develop and implement suitable capacity plans, capacity plans were continuously downgraded and/or postponed. Eight of the fourteen FABEC ACCs are expected to experience capacity shortfalls for significant periods of RP2 - All of the above ACCs/UACs have significantly downgraded or postponed capacity improvements in recent years. The aggregation of the individual ANSPs to FAB performance is not consistent with either the relevant FAB reference value, or with the FAB target¹⁷⁶
- Cost: As advised in the PRB Assessment Reports for RP2 "the aggregated FAB en-route trend should not be seen as a "FAB cost efficiency assessment". Currently the cost-efficiency assessment can only be carried out at charging zone level (en-route and terminal) and for RP2 there are no FAB with a common charging zone and a single unit rate." The PRB considered that the en-route cost-efficiency targets for all FABEC states for RP2 do not meet the consistency criteria.

2.7.4 Assessment of economic aspects

2.7.4.1 FAB CBA analysis

The main results of the CBA that was conducted in 2012 are the following¹⁷⁷.

- Cash-flow benefit of € 0,4 million in 2012, rising to € 7 million in 2014 and € 23 million in 2020; stable development thereafter at € 22 million per year. These would stem from, among other things:
 - Cost savings for ATM systems and related technical support;
 - Cost savings through joint procurement and maintenance technical systems; and
 - Cost savings through common training and qualification of personnel
- Delay saving for airspace users through
 - capacity improvement with the AMRUFRA project; €13.5-6 million per annum, assumed to start by 2013
 - lifting flow restrictions via the AD West II project, resulting in € 4.5 million per annum as per 2012.
- Flight efficiency benefits for airspace users. Maximum yearly benefit of € 147 million by 2025; around € 61 million in 2015 and € 99 million in 2020. These are caused by the implementation of the AD projects for the Hotspots and based on the first steps of the FRA.

¹⁷⁶ FABEC_ PRB Assessment Report of RP2 FAB Revised Performance Targets – FABEC

¹⁷⁷ FABEC, 2012, FABEC Implementation phase Cost benefit analysis EC information annex R.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- Total net present value 2011-2025: € 734 million.

A response to the ANSP level data collection questionnaire from FABEC (ANSP) in which we have asked to which extent these benefits have materialised to date, has been received. As indicated in 2.6.3 above, some of the scheduled initiatives are ongoing and thus some of these benefits have been realised. However, it seems that the actual level of benefits incurred by users is far less than foreseen in the CBA. For flight efficiency, FRA resulted in € 3.7 million in flight efficiency benefits in 2015, while the CBA pencilled in an amount of € 61 million for this year. That said, the NPV for FRA is updated regularly. Common training has not lead to benefits yet. ATCO mobility would bring benefits. The ideal is to have one harmonized training system, but the systems are not the same and have different life cycles. The NPVs for FRA and XMAN projects do show significant benefits for FABEC customers. However, it seems that the benefits are less than foreseen in the CBA. FABEC has indicated that the FRA project has approximately been completed for 40% now (completion date December 2021) and should to >€10M in annual benefits. XMAN has been completed for approximately 50% (completion date December 2023) and should also lead to >€10M in annual benefits.

2.7.4.2 Performance in cost-efficiency KPA (actual performance RP 1)

The performance in terms of cost efficiency during RP1 is provided in the following table. Cost efficiency was only reported on individual ANSP level during RP1. Data for 2015 (first year RP2) are not yet available. Values in red indicate the actual rate was higher than the target.

	2012		2013		2014	
	Target	Actual	Target	Actual	Target	Actual
Belgium-Luxembourg	€ 67.86	€ 65.56	€ 65.47	€ 64.90	€ 63.21	€ 59.72
France	€ 62.78	€ 61.27	€ 61.54	€ 60.09	€ 59.99	€ 59.27
Germany	€ 71.42	€ 76.36	€ 69.81	€ 73.47	€ 67.81	€ 73.12
The Netherlands	€ 58.86	€ 61.92	€ 57.47	€ 58.29	€ 56.84	€ 58.59
Switzerland	€ 71.68	€ 75.99	€ 71.10	€ 72.50	€ 71.04	€ 72.63

Source: PRB Monitoring reports

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

2.7.4.3 Unit rates RP 2, unit costs and charging zones

The following determined unit costs for RP 2 apply on FAB level, based on the FAB performance plan.

	2015	2016	2017	2018	2019
TSUs	38.161.875	39.039.901	39.338.207	39.804.961	40.283.844
Real en route UCs/DUCs (in € 2012 prices)	72,66	69,71	69,22	67,96	66,43
Trend in real en route UCs/DUCs (in € 2012 prices) %n/n-1	4,51%	-4,05%	-0,71%	-1,81%	-2,26%
Real en route UCs/DUCs (in € 2009 prices)	67,84	65,08	64,62	63,44	62,00
Trend in real en route UCs/DUCs (in € 2009 prices) %n/n-1	4,56%	-4,06%	-0,72%	-1,81%	-2,27%

Source: FABEC Performance plan RP2

The PRB considered that the en-route cost-efficiency targets for all FABEC states for RP2 do not meet the consistency criteria.

The unit rates of route charges applicable to December flights (in €, based on November 2016 exchange rates) for the FAB member states are as follows:

Belgium: 65.50

France:67.63

Germany:82.68

Luxemburg:65.50

Netherlands:67.09

Switzerland:105.92

Charging zones:

- 5 en route charging zones: BE-LUX, FR, DE, NL, CH
- 10 terminal charging zones: BE (5), LUX, FR, DE, NL, CH

In response to the ANSP level data collection questionnaire, complemented by an interview, FABEC has considered establishing a common level charging zone. In the FABEC position paper for RP2, it was mentioned that FAB common charging zones should be a mid-term objective to allow a consistent intra-FAB performance management¹⁷⁸.

¹⁷⁸ FABEC ANSP Position on RP2 regulatory approach-final, 2012.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

In the context of RP3, a study on the FIN framework has been conducted, which will be presented at the next FABEC council. The conclusion was that there would be operational advantages, but it is not clear how it would work. The main constraint is the need to converge the cost base. A number of other issues include revenue sharing, volatility and the proportionality of costs and benefits. Also the way of charging, currently at state boundaries, should change for a common level charging zone to be possible. Discussions on cross border operations would in future need to ensure that the operator recovers the revenues for their activity. Furthermore, the ANSP models are not the same and some airlines don't want a common level charging zone. Revenue distribution can address most of these issues. The idea of a common level charging zone is viable, but it needs political support. So far no mitigating initiatives have been undertaken.

2.7.4.4 Resource-efficiency measures in core services and support services

Through the ANSP level data collection questionnaire, the study team asked to which extent resource efficiency measures have been undertaken in the frame of FABEC. The answers provided to the questionnaire were complemented by the FAB interview. The responses included the following:

- Joint training and training infrastructure of ANS personnel
MUAC basic training; ENAC.
On FABEC level, there is a basic training course. Until date consolidating the trainings is not on the radar, as most ANSPs have their own training centres.
- Joint procurement + Common CNS infrastructure developments
Replacement of VORs, replacement of ILS.
The main issue with common procurement seems to be the need for synchronised life cycles, which is often not the case. It is now more about opportunities than about projects.
- Harmonised ATM systems and tools
ICAS II.
The objective of FABEC is to have harmonised procedures to enable FRA. For the first time there is now a common tool. FABEC is trying to make the tool interoperable. 6 out of the 7 FABEC ANSPs are using the ASM tool.
- Establishment of joint CCs whenever beneficial
MUAC Lippe Rada integration
- Cross border service provision or cross-border delegation of ANS
Cross-border arrangements are in place within FABEC airspace. Cross-border arrangements between FABEC ANSPs in the frame of Art. 10 Regulation (EC) No. 550/2004 (SPR)
- Joint contingency arrangements
Between Belgocontrol, DFS, LVNL and DSNA.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

2.7.4.5 Conclusions on economic aspects of the FAB

FABEC foresaw large economic benefits in the CBA. These have not materialised to full extent, however, judging from the implemented operational and technical projects, some benefits have been realised. It has not been possible to assess the costs and benefits in the light of reports published by the PRB and NM, as those reports provide no substantial basis on which this could be conducted.

FABEC has incurred administrative costs to set up and run the FAB, but has not reported on these costs and these costs can therefore not be assessed.

In terms of technical harmonisation and rationalisation FABEC has implemented Harmonised Systems, Coordination for New Technology Deployment, Common CNS infrastructure, Joint Training and Joint Procurement.

FABEC has implemented FRA throughout the FAB, which have resulted in flight-efficiency benefits for the FAB. However, it has not become clear to the study team if the benefits of FRA can be attributed to the FAB initiative. FRA could have happened regardless of the FAB initiative.

2.8 NEFAB

2.8.1 General information

NEFAB (North-European Functional Airspace Block) comprises Estonia, Finland, Latvia and Norway.

The first step towards the creation of NEFAB was a pre-feasibility study, initiated in 2007, regarding the viability of establishing a FAB in the northern part of Europe. The States involved in the NEFAB initially included Sweden, Denmark, Norway, Finland, Estonia, Iceland, and Latvia (from 2009). However, Sweden, Denmark and Iceland discontinued their participation in the project.¹⁷⁹

NEFAB was formally established through the State-level Agreement signed by the four participating Member States on 4 June 2012. NEFAB's vision is to optimise the services "to customer expectations, with focus on safe, cost efficient and environmental performance".¹⁸⁰

The table below summarises the constituent entities of NEFAB:

Table 10 NEFAB overview

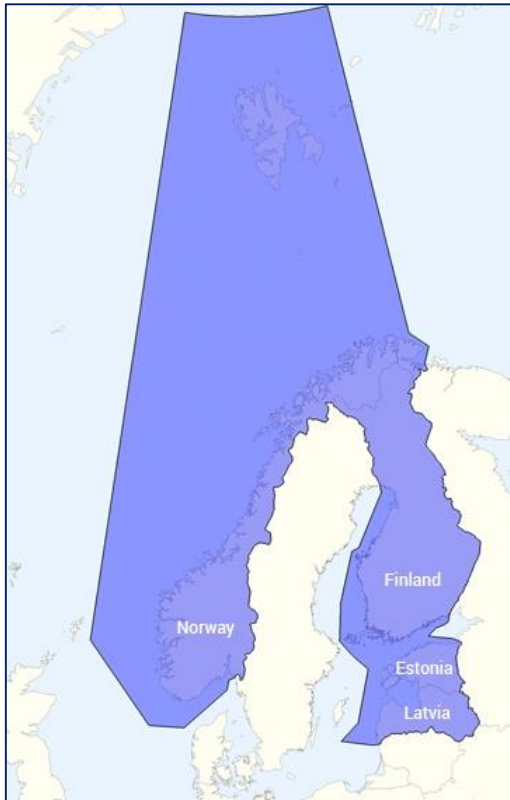
Member States	Air navigation service providers	National supervisory authorities
Estonia	EANS	Civil Aviation Administration of Estonia
Finland	Finavia	Finnish Transport Safety Agency (TRAFI)
Latvia	LGS	Civil Aviation Agency of Latvia
Norway	Avinor	Civil Aviation Authority of Norway

¹⁷⁹ Information Note to the Commission, the European Aviation Safety Agency (EASA), other Member States and Interested Parties on the Establishment of NEFAB (December 2011)

¹⁸⁰ NEFAB website

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

Figure 24 NEFAB geographic scope



As pictured on the attached map, the geographic scope of NEFAB encompasses the following flight information regions (FIR) and upper information regions (UIR) of North European airspace:

- a. Estonia;
- b. Finland;
- c. Latvia;
- d. Norway;
- e. Bodø Oceanic.

The services included in the scope of NEFAB cooperation include ATS, CNS, MET and AIS. The FAB activities do not cover terminal ANS and Search and Rescue (SAR).¹⁸¹

On September 1 2016, the air navigation service providers Avinor and Finavia signed the Service Agreement committing themselves to

cross border Air Traffic Services between Norway and Finland. In line with the Agreement, the parties have agreed to transfer the responsibility for Air Traffic Services from parts in the Finnish airspace to Kirkenes Tower/Approach in Norway. The new arrangement will facilitate more efficient flight operations in this cross-border area.

The NEFAB ANSPs cover a large geographical area and serve air traffic to and from a wide range of airports, from small remote regional airports to national hubs with considerable traffic volumes. In addition, there are also considerable amounts of overflying traffic in NEFAB airspace, including ultra-long haul operations.¹⁸²

2.8.2 Institutional and legal arrangements

2.8.2.1 Legal basis

NEFAB is built upon the following agreements concluded at State, NSA, and ANSP level:

- State-level Agreement: *Agreement on the Establishment of the North-European Functional Airspace Block* (signed on 4 June 2012);
- NSA-level Agreement: *Cooperation Agreement between the National Supervisory Authorities of the North-European Functional Airspace Block*¹⁸³;

¹⁸¹ NEFAB State-level Agreement; NEFAB response to ANSP-level data collection questionnaire

¹⁸² NEFAB business plan 2017-2021, <http://www.nefab.eu/docs?download=54>, available 12/10/2016

¹⁸³ Initialled version published on NEFAB website

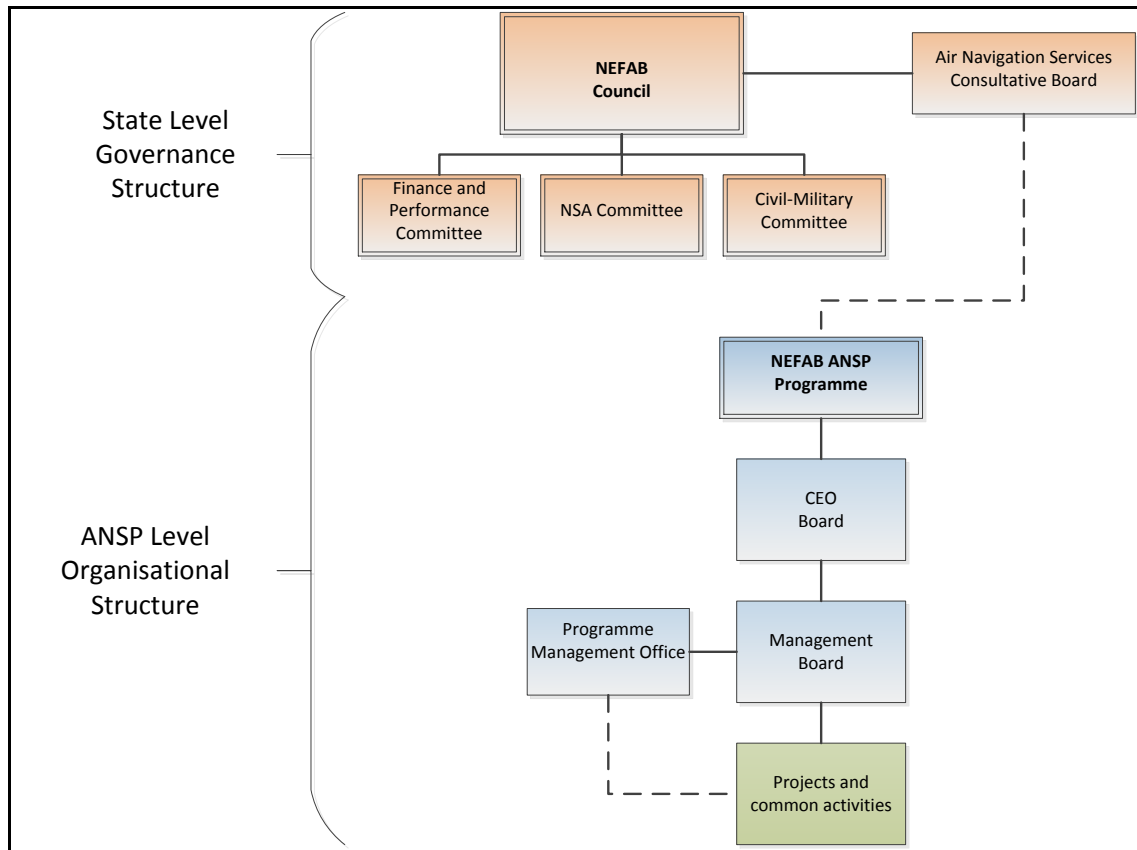
**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- ANSP-level Agreement: *Cooperation Agreement on the Operation of the North European Functional Airspace Block between Avinor AS, Lennuliiklusteeninduse AS, Finavia Corporation, and State Joint-Stock Company "Latvijas gaisa satiksme"- LGS* (updated version signed on 8 March 2016).

2.8.2.2 Governance¹⁸⁴

The NEFAB governance arrangements are illustrated in the chart below:

Figure 25 Governance structure of NEFAB



The highest decision-making body of the FAB is the NEFAB Council, which is responsible for the overall implementation of the NEFAB Agreement. Each NEFAB State is represented at the NEFAB Council by one representative from the competent authority responsible for civil aviation, and one representative from the competent authority responsible for military aviation.

The NEFAB Council meets at least twice a year, and is assisted by the following committees: the NSA Committee, the Civil-Military Committee, and the Financial and Performance Committee. Decisions in the NEFAB Council and State-level Committees require unanimity.

¹⁸⁴ Information sources: NEFAB State-level Agreement; NEFAB ANSP-level Agreement; NEFAB response to ANSP-level data collection questionnaire; Rules of Procedure, NEFAB Council; NEFAB Programme Business Plan 2017-2021

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The Air Navigation Services Consultative Board was established in order to ensure the consultation of ANSPs on matters relating to the provision of services within NEFAB. The Air Navigation Services Consultative Board comprises representatives from the NEFAB Council, the NSA Committee, ANSPs and MET service providers.

The NEFAB ANSP Programme is responsible for the planning and execution of common ANSP-level activities, including business planning, budget and cost management, project initiation and execution, and communication. The ANSP Programme governance bodies are the CEO Board, acting as the ultimate decision making body in the ANSP cooperation, as well as the Management Board which monitors the performance and execution of the NEFAB Business Plan.

The NEFAB Programme Management Office (PMO) manages the NEFAB Programme and supports the ANSPs and States in respect of NEFAB activities, including as regards information exchange and stakeholder engagement.

In addition to the governance structure of the NEFAB ANSP Programme, support functions are set up on case-by-case basis. Currently, the following support functions are implemented:

- Safety support;
- Common representation in SESAR Deployment Manager Stakeholder Consultation Platform Steering Group and Thematic Subgroups.

Specific projects are established under separate project structures. Such activities are resourced and implemented jointly by ANSPs on the NEFAB level and monitored by the Management Board.

The decision-making in the NEFAB ANSP Programme is generally based on the consensus of all parties. In accordance with the ANSP Agreement, defined issues specifically require unanimity, others a qualified majority of at least 75%.

2.8.2.3 NSA cooperation¹⁸⁵

The cooperation of NEFAB NSAs covers all the key areas of FAB implementation.

As regards cooperation in respect of ANS oversight, national audit plans are shared between the NSAs and there is an agreement to allow NSAs from any NEFAB state to participate in any audit performed by a NEFAB NSA. In order to support this process, a procedure for common audits has been established. The certification of ANSPs remains the responsibility of each NSA, and no common certification process is currently in place.

The exchange of safety data and information is organised in the framework of a specific expert group on safety related matters. The safety data is exchanged via a web based tool and is analysed by the expert group. The group provides NEFAB safety reports with proposals for corrective actions as necessary. The group reports to the NSA Committee.

¹⁸⁵ Information source: NEFAB response to NSA-level data collection questionnaire

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

NEFAB NSAs have established a NEFAB NSA Handbook. Accordingly, NEFAB level processes are harmonised and used in NEFAB level activities (e.g. oversight, change management). However, each NSA still also has its own national processes.

Some very basic common principles have been established in respect of the qualification and training requirements for NSA inspectors. In the end, each NSA remains responsible for the qualifications and competency of their personnel. No common training has been provided so far – however, there is a reference to the Eurocontrol IANS courses as a basis in NEFAB documentation.

The NSAs are sharing expertise with each other within the various NEFAB expert groups, and some exchange of inspectors (for training purposes) has taken place.

There is an effective procedure for the joint development of the FAB Performance Plan. The RP2 FAB Performance Plan was developed jointly – however the ANSP investments as such are approved by each individual NSA (there is no joint review or approval of ANSP investments).

The situation regarding NSA resources varies a lot between the NEFAB states. There are some challenges as regards the availability of adequate resources for FAB activities, with some NSAs having extremely limited resources for this purpose. In Finland and Norway, the available resources can be considered sufficient for the FAB level activities and NEFAB has successfully managed the FAB performance development process and related monitoring tasks.

The NEFAB NSAs aim to further enhance their cross-border cooperation in the FAB context, and are planning to explore solutions regarding the division of tasks. The general objective is to harmonise all NSA procedures as far as practicable. In the next few years, NEFAB NSAs expect developments to be driven mostly by industrial partnerships between ANSPs, and NSAs will adapt their approach in the light of this context.

2.8.2.4 Customer engagement, stakeholder consultation and communication

¹⁸⁶

NEFAB has established a Communications and Stakeholder Engagement Strategy. Stakeholder engagement and communication have been executed at Programme level and individually by each ANSP depending on the target audience.

Airspace users are invited to annual consultation meetings. A dedicated area for airspace users has been developed on the NEFAB website in order to summarise and distribute all the relevant information for airspace users, and to communicate on the outcome of consultations.

The NEFAB website¹⁸⁷ provides a wide range of information and updates on the status and activities of the FAB. The website also supports live communication through such

¹⁸⁶ Information sources: NEFAB response to ANSP-level data collection questionnaire; NEFAB website

¹⁸⁷ NEFAB website: <http://www.nefab.eu/>

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

features as highlights of the latest news items, archives, an extensive section on Free Route Airspace, a subscription tool, and links with social networks. All the key NEFAB documents and deliverables (incl. updated versions) are published on the website.

2.8.2.5 **Social dialogue**¹⁸⁸

The NEFAB Programme is not directly communicating with the ANSPs' personnel, trade unions or other staff representatives. The responsibility for communication with the personnel and trade union representatives is vested with the individual ANSPs. The NEFAB Programme has supported the ANSPs by developing presentation material on the NEFAB Programme.

2.8.2.6 **Inter-FAB cooperation and cooperation with third countries**¹⁸⁹

NEFAB has close cooperation with the DK-SE FAB as well as with Iceland. The cooperation has been pursued at ministerial, NSA and ANSP levels, and has supported the NEFRA (North European Free Route Airspace) Programme implementation.

As regards industrial partnerships, all NEFAB ANSPs are member of the Borealis alliance together with IAA, Isavia, Naviair, NATS and LFV. The Borealis Alliance is a strategic business cooperation between the ANSPs.

NEFAB ANSPs (except LGS) are also partners in SESAR through the NORACON consortium; however, NORACON will be terminated in early 2017.

Moreover, there is cooperation in the field of aviation weather services between the MET providers of NEFAB and the DK-SE FAB, who have together established the NAMCon consortium. The milestones reported for 2015 were the joint production of Significant Weather Charts (SWC) between the Finnish Meteorological Institute (FMI) and the Swedish Meteorological and Hydrological Institute (SMHI) and a NAMCon-wide aviation weather briefing portal.

¹⁸⁸ Information source: NEFAB response to ANSP-level data collection questionnaire

¹⁸⁹ Information sources: NEFAB Programme Business Plan 2017– 2021; NEFAB response to ANSP-level data collection questionnaire

2.8.3 Operational context and status

2.8.3.1 Overview of operational and technical elements

NEFAB																					
Geographic scope and traffic features	<ul style="list-style-type: none"> Estonia, Finland, Latvia, Norway, and Bodø Oceanic. Traffic is distributed as follows: <table style="margin-left: 40px; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>Overflights (%)</u></th> <th style="text-align: center;"><u>Int. Arr/Dep (%)</u></th> <th style="text-align: center;"><u>Domestic (%)</u></th> </tr> </thead> <tbody> <tr> <td>Estonia</td> <td style="text-align: center;">81</td> <td style="text-align: center;">17</td> <td style="text-align: center;">1</td> </tr> <tr> <td>Finland</td> <td style="text-align: center;">60</td> <td style="text-align: center;">20</td> <td style="text-align: center;">20</td> </tr> <tr> <td>Latvia</td> <td style="text-align: center;">73</td> <td style="text-align: center;">27</td> <td style="text-align: center;">0</td> </tr> <tr> <td>Norway</td> <td style="text-align: center;">10</td> <td style="text-align: center;">40</td> <td style="text-align: center;">50</td> </tr> </tbody> </table> 		<u>Overflights (%)</u>	<u>Int. Arr/Dep (%)</u>	<u>Domestic (%)</u>	Estonia	81	17	1	Finland	60	20	20	Latvia	73	27	0	Norway	10	40	50
	<u>Overflights (%)</u>	<u>Int. Arr/Dep (%)</u>	<u>Domestic (%)</u>																		
Estonia	81	17	1																		
Finland	60	20	20																		
Latvia	73	27	0																		
Norway	10	40	50																		
Number of States	<ul style="list-style-type: none"> Four state FAB - Estonia, Finland, Latvia, Norway 																				
Scope of FAB service provision¹⁹⁰	<ul style="list-style-type: none"> En-route ATS in all FIRs/UIRs. All ANSPs provide ATCO training, Avinor provides ATC oceanic. MET service providers are the national Norwegian (NMI), Finnish (FMI) and Latvian (LEGMC) meteorological institutes/centres. State owned EANS provides ATS, AIS, CNS, ATCO training Finavia Corporation provides en-route and terminal air navigation services in Finland. LGS – Latvijas gaisa Satiksme – provides all services related to ATM, provides ATC to all military flights that operate as GAT, SAR coordination centre is based in LGS, CNS/ATM systems owned and maintained by LGS, MET Avinor provides Air Navigation Services, operates 46 aerodromes in Norway. MET services to military and civil traffic are provided by The Norwegian Meteorological Institute. 																				
FAB Business/Implementation Plans	<ul style="list-style-type: none"> The latest business plan was issued on 05/09/2016¹⁹¹ for which key projects are: 																				

¹⁹⁰ NEFAB Performance Plan – RP2 (2015-2019), 10/6/2014

¹⁹¹ NEFAB business plan 2017-2021, <http://www.nefab.eu/docs?download=54>, available 12/10/2016

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

	<ul style="list-style-type: none"> ○ Continued participation in the Borealis FRA Programme, including development of common harmonised OLDI concept to reduce coordination. ○ Study of new sectorisation based on traffic flows and CBA and including cross border operations with DK-SE FAB. ○ NEFAB Contingency Concept. ○ Common Flight Planning Centre ○ Continued harmonisation and integration of safety management system. ○ Development of NEFAB Low-Cost Remote Towers concept.
<p>Airspace configuration / ATFM</p>	<ul style="list-style-type: none"> ● Since 23 June 2016 a seamless Free Route Airspace became active across NEFAB East (Estonia, Finland, and Latvia) and DK/SE FAB (Denmark and Sweden).
<p>Convergence of operational concepts and systems</p>	<ul style="list-style-type: none"> ● IR (EU) No716/2014 (Pilot Common Project) - Multi FAB Free Route Airspace (Borealis FRA Programme) Participation at development and implementation phases of Borealis FRA Programme, including development of common harmonised OLDI concept to reduce coordination ● Harmonisation: Rules and procedures (NSA committee). From the NSA committee the Council can expect: <ul style="list-style-type: none"> ○ Periodic Performance Dashboard presentations/ assessments on evolution and achievements in relation to adopted performance plans 2012-2014 as well as RP 2 (2015-2019) plan ○ Periodic reports on regulatory harmonisation activities ● Harmonisation: From the Civil-Military Committee, the council can expect: <ul style="list-style-type: none"> ○ Report to the NEFAB Council on FUA application in the NEFAB States and future common FUA harmonisation in NEFAB (Progress report end 2015)

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

	<ul style="list-style-type: none"> ○ Harmonisation in regards to military aviation as far as appropriate i.e. common military requirements and harmonisation of procedures ○ Aspiration for harmonized Civil Military view as far as practical on issues relevant to efficient use of airspace e.g. NEFRA.
FAB integration for delivery of the new technology AND Rationalisation of systems and equipment	<ul style="list-style-type: none"> ● None identified.
Rationalisation of support services	<ul style="list-style-type: none"> ● None identified.

NEFAB operational highlights are:

Since 23 June 2016 Free Route Airspace became active across NEFAB East (Estonia, Finland, and Latvia).

2.8.3.2 Detailed review

Airspace configuration / ATFM¹⁹²

NEFAB's airspace is composed of the following flight information regions (FIR) and upper information regions (UIR) of the North European airspace: Estonia, Finland, Latvia, Norway, and Bodø Oceanic. The States are responsible for creating in this area a seamless airspace across their national borders and supervising the cooperation of air navigation service providers and other stakeholders in order to maintain safe and efficient airspace management, whilst respecting the sovereign interests of the contracting States.¹⁹³

Norway FIR is surrounded by FIRs of 6 States, namely United Kingdom (Scottish FIR), Iceland (Reykjavik FIR), Russia (Murmansk FIR), Finland (Finland FIR), Sweden (Sweden FIR) and Denmark (Copenhagen FIR). Among the above, Russia is the only non-ECAC bordering state. Bodø Oceanic FIR is a part of the NAT-region.

Finland FIR is surrounded by FIRs of 4 States, namely Norway (Norway FIR/UIR), Sweden (Sweden FIR/UIR), Estonia (Tallinn FIR/UIR) and a non-ECAC State, Russia (St Petersburg FIR and Murmansk FIR). In order to achieve some of the objectives of the European ATM Master Plan (Level 3), Finland ACC co-ordinates actions with a number of foreign adjacent ACCs.

¹⁹² LSSIP 2015 documents for each of four states

¹⁹³ NEFAB initiative, <http://www.nefab.eu/about>, available 12/10/2016

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Estonia's FIR is surrounded by FIRs of 4 States, namely Finland FIR and Helsinki TMA to the North, St. Petersburg FIR to the East, Riga FIR/TMA to the South and Malmö/Stockholm FIR-s to the West. St. Petersburg belongs to the Russian Federation, a non- ECAC State.

RIGA FIR is surrounded by FIRs of 5 States, namely Estonia, Russian Federation, Belarus, Lithuania and Sweden. Adjacent FIR/UIRs of ECAC States:

- North - Tallinn FIR/UIR (Estonia)
- West - Malmö and Stockholm FIRs/UIRs (Sweden);
- South - Vilnius FIR/UIR (Lithuania).

Adjacent FIR/UIRs of non-ECAC States:

- East - Sankt-Petersburg FIR/UIR (Russian Federation);
- Southeast - Minsk FIR/UIR (Belarus)

Convergence of operational concepts and systems

- The NEFAB programme is running several harmonisation activities to optimise business within NEFAB itself, where to be mentioned as ongoing are: Cross border sectorisation and service provision, Multi FAB Free Route Airspace; and some activities are under study: Contingency arrangements, Common flight planning centre.¹⁹⁴
- Harmonised ATM systems and tools: Harmonised application of ASM and FUA is ongoing. Common Flight Data Centre is one element in a new project covering (dynamic) Cross Border Sectorisation and Services, and operational contingency arrangements termed the NEFAB Target Concept 2020+. This project is in its initial phase of a business case study. The common Flight Data Centre – physical or virtual – is intended to support the ACCs operations with correct flight data when the automated systems fails. Final decisions for development and implementation will be based on the study. The NEFAB Target Concept 2020+ will study dynamic sectorisation and contingency operations in NEFAB airspace as one continuum and develop sectorisation according to the traffic flows. The intention is to enable more cost efficient service provision. Sectors will be cross state borders and dynamic in terms of size, shape and service provision. An ANSP will by this be providing service in another state. Key challenges will be mapped during the case study and feasibility study, but assumable ATM systems operating in dynamic sectorisation modes will be a key challenge, as well as ASM and FUA arrangements. The study will also cover legal and security issues.
- ASM tool LARA is a common operational requirement in the NEFAB operational concept. LARA is not yet fully implemented but in process of being implemented in each State/ANSP. The Civil Military has contributed to the implementation of

¹⁹⁴ FAB data collection_ANSP questionnaire v0.2

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

the FAB concept related to airspace design and LARA/PRISMIL tool. Airspace Management (ASM) and Application of FUA is harmonized¹⁹⁵.

Rationalisation of systems and equipment

Rationalisation of systems is planned, taking into account the life cycles of current systems, European regulation requirements and cost benefit factors

Rationalisation of support services

The common training initiative was described in the feasibility study, and contains general description about feasible opportunities and initiatives. IANS is mentioned as one of several external training institutions where training can be done.

The NAMCON consortium continues to make progress in its key objectives according to the annual Work Plan and Strategy. On 26 February 2016 NAMCON launched a weather briefing portal with all MET information from its 7 members at <https://northavimet.com>. In 2016 NAMCON was awarded with the SESAR Deployment projects: Regional SWIM MET deployment to support NEFRA (Part A) and (Part B) that will further harmonise production processes and enable SWIM-compliant MET services in Northern Europe. In late 2016 / early 2017 the joint guidelines for TAF will be published and the joint Baltic Significant Weather Chart (BSWC) production between ESTEA and LEGMC will begin. DMI and SMHI will also implement a new Low-Level Forecast System producing a new graphical low-level forecast to be later implemented in other NAMCON countries. NAMCON has short and long term objectives outlined in each annual Work Plan and Strategy.

Rationalisation of service provision

None identified

Performance scheme¹⁹⁶

- Safety: the FAB targets submitted for RP2 are consistent with European wide target.
- Environmental: The target for horizontal flight efficiency (KEA) in 2015 was 1.35% and that achieved 1.40%¹⁹⁷.
- The capacity target in 2015 was 0.12 min that achieved 0.04 min.
- Cost: The PRB's RP2 assessment report has judged the cost efficiency of NEFAB (submitted by States individually) to be consistent with the EU level targets.

¹⁹⁵ FAB data collection_ANSP questionnaire v0.2

¹⁹⁶ PRU Dashboard – RP2 - http://www.eurocontrol.int/prudata/dashboard/rp2_2015.html

¹⁹⁷ PRB performance dashboard: http://www.eurocontrol.int/prudata/dashboard/rp2_2015.html.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

2.8.4 Assessment of economic aspects

2.8.4.1 FAB CBA analysis

The main results of the CBA that was conducted in 2011 are the following¹⁹⁸.

- The CBA anticipated that there would be benefits of NEFAB for airspace users stemming from saving in fuel, maintenance costs, ETS emission costs and operational costs due to time savings. These benefits were expected to accrue to airspace users already by 2012, and are reported in the CBA per 2015 onwards.
- The CBA indicated that there would be time savings for passengers
- The CBA indicated that there would be reduced emissions that are of benefit for 'society as a whole'.
- The CBA indicated that there would be net financial savings for the ANSPs in the FAB. These were expected minimal / negative by 2015, and more substantial from 2020 onwards.

Total short term net benefits were estimated to be slightly around € 55 million for 2015. The two charts below display the calculated two scenarios.

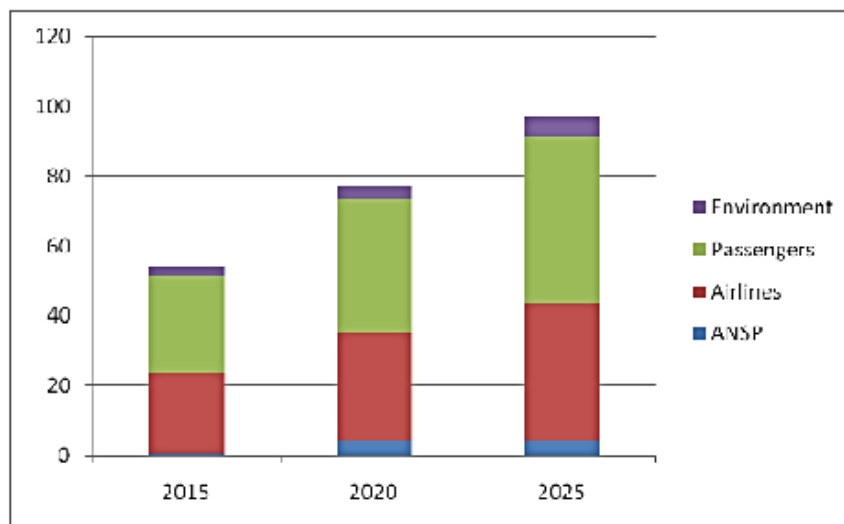


Figure 1: Distribution of internal and external benefits in the Minimum scenario

¹⁹⁸ Avinor, EANS, Finavia, LGS, 2011, NEFAB socio-economic study, volume 1, main report, and Avinor, EANS, Finavia, LGS, 2011, NEFAB socio-economic study, Feasibility study – cost-benefit analysis, v3.0

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

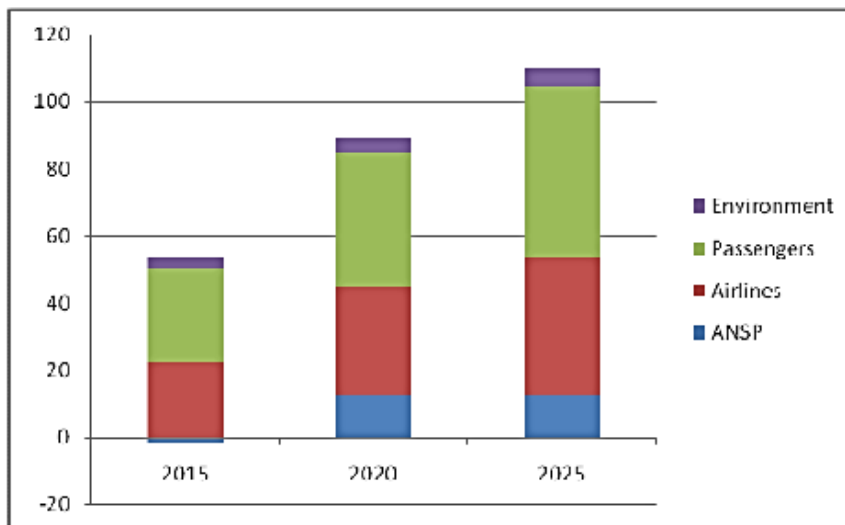


Figure 2: Distribution of internal and external benefits in the Performance scenario

In the survey among the FABs, we have asked if the benefits from the CBA did materialise. NEFAB indicated in summary:

Flight efficiency: Implementation of NEFAB FRA and cooperation with DKSE FAB in establishing seamless FRA interface enables airspace users to plan and operate according to business/user preferred trajectories within NEFAB FRA and across the two FAB FRAs. However, it is solely air carriers' preference whether to use the FRA or to operate according to the fixed route network. The only indicator for ANSPs in assessing the impact and benefits is to consult with flight planning companies and airspace users and learn their experiences. The study team concludes from this answer that it is unknown to NEFAB to which extent FRA is truly used, and thus if the benefits as foreseen in the CBA materialised. However, based on the response to the questions on operational issues (see 2.8.3) the conclusion is that in the period 2012-2015 any measures taken did not affect yet flight efficiency, and thus did not yet contribute to flight efficiency benefits.

Delay reduction: Capacity (and delays) was included in the FAB CBA. There have been no delays in NEFAB area. The study team concludes that delays were indeed limited during RP1 (but not zero). Based on the operational measures taken (See 2.8.3) the conclusion is that in the period 2012-2015 any measures taken did not affect yet capacity, and thus did not yet contribute to capacity benefits.

Cost efficiency: the unit rates of the NEFAB states are one of the lowest in Europe and did not increase significantly since the establishment of the FAB, despite the investments in FRA and the network plan. The study team concludes based on the survey that there have not been implemented yet any resource efficiency measures yet that contributed significantly to improving cost efficiency, which was in line with the NEFAB CBA. Some measures (cross border delegations) are anticipated to contribute more significantly in the course of RP2 (see also below under resource efficiency measures). The original CBA also identified potential rationalisation of systems and some common procurement of

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

CNS, but NEFAB has reported that the local arrangements that have stemmed from that since can be considered to be irrespective of the establishment of the FAB.

Safety: common safety cases on new common initiatives (e.g. FRA) were undertaken. Other than that, the individual providers have their own safety systems.

Other: Establishment of NEFAB encouraged the ANSPs to closer cooperation and joint activities. The development and implementation of the NEFAB Network Plan with the Free Route Airspace is a result of FAB cooperation resulting in establishing FAB Free Route Airspace well ahead of the EU requirement in the Regulation EC 716/2014.

2.8.4.2 Performance in cost-efficiency KPA (actual performance RP 1)

The performance in terms of cost efficiency during RP1 is provided in the following table. Cost efficiency was only reported on individual ANSP level during RP1. Data for 2015 (first year RP2) are not yet available. Values in red indicate the actual rate was higher than the target.

	2012		2013		2014	
	Target	Actual	Target	Actual	Target	Actual
Estonia	€ 20.31	€ 20.42	€ 19.78	€ 19.82	€ 19.84	€ 19.80
Finland	€ 47.56	€ 51.57	€ 46.54	€ 51.29	€ 44.43	€ 49.66
Latvia	€ 28.43	€ 27.97	€ 27.34	€ 26.36	€ 26.64	€ 25.74
Norway	€ 55.34	€ 50.71	€ 53.58	€ 51.54	€ 51.18	€ 45.46

Source: PRB Monitoring reports

2.8.4.3 Unit rates RP 2, unit costs and charging zones

The following determined unit costs for RP 2 apply on FAB level, based on the FAB performance plan.

	2015	2016	2017	2018	2019
TSUs	38.161.875	39.039.901	39.338.207	39.804.961	40.283.844
Real en route UCs/DUCs (in € 2012 prices)	45,52	44,44	43,24	41,82	40,39
Trend in real en route UCs/DUCs (in € 2012 prices) %_{n/n-1}	-2,49 %	-2,36 %	-2,71 %	-3,29 %	-3,41 %
Real en route UCs/DUCs (in € 2009 prices)	39,41	38,47	37,43	36,21	34,99
Trend in real en route UCs/DUCs (in € 2009 prices) %_{n/n-1}	-2,54 %	-2,38 %	-2,70 %	-3,26 %	-3,37 %

Source: NEFAB Performance plan RP2

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The unit rates of route charges applicable to December flights (in €, based on November 2016 exchange rates) for the FAB member states are as follows:

Estonia:-

Finland: 56.32

Latvia: 27.40

Norway: 42.13

Charging zones:

- 4 en route charging zones: Estonia, Finland, Latvia, Norway
- 4 terminal charging zones: Estonia, Finland, Latvia, Norway

NEFAB indicates that it has not examined the possibility to establish a common FAB level charging zone.

2.8.4.4 Resource-efficiency measures in core services and support services

In our FAB ANSP level data collection questionnaire, we asked to which extent resource efficiency measures have been undertaken in the frame of NEFAB. NEFAB indicated the following measures, including the contribution to the performance scheme KPAs.

	Resource-efficiency measure	Performed/Planned activities	Results/Achievements	Performance contribution per KPA	
				RP1	RP2
X	Joint maintenance	Where feasible joint maintenance activities are executed	LGS and EANS AMHS	SAF: No CAP: No ENV: No COE: No	SAF: No CAP: No ENV: No COE: Low
X	Synchronised life cycles of technical ATM systems	Where feasible joint synchronisation activities are executed	Finavia and EANS ATM System	SAF: No CAP: No ENV: No COE: No	SAF: Low CAP: Low ENV: No COE: Med

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Resource-efficiency measure		Performed/Planned activities	Results/Achievements	Performance contribution per KPA	
X	Harmonised ATM systems and tools	Harmonised application of ASM and FUA Implementation of ASM LARA tool	Harmonised application of ASM and FUA ASM LARA tool, Implemented	SAF: No CAP: No ENV: No COE: No	SAF: No CAP: No ENV: No COE: Low
X	Rationalised capex which addresses long-term ATM development	Coordinated and common co funding application	Borealis FRA	SAF: No CAP: No ENV: No COE: No	SAF: No CAP: No ENV: No COE: Low
X	Coordination of ANSPs' investment plans	SDM Stakeholder Consultation Platform to identify activities of a common interest	ANSPs' planned investments are coordinated as far as practicable via the SDM Stakeholder Consultation Platform through investigating common interests and co-funding opportunities	SAF: No CAP: No ENV: No COE: No	SAF: No CAP: No ENV: No COE: Low

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

	Resource-efficiency measure	Performed/Planned activities	Results/Achievements	Performance contribution per KPA	
X	Cross-border service provision or cross-border delegation of ANS	<p>Cross border ATS delegation areas before FABs:</p> <ul style="list-style-type: none"> - Halti - Manto - Kvarken - Ninta - Finnskogen 1 and 2 - Nor 2 - Tekva - Ørje 1 and 2 - Bohus - Koster - Oslob - Borge - Norli - Silver - North Sea Area 1 and 2 <p>Fiesta project (Finavia and EANS) 2005, arrival services to Helsinki.</p> <p>Extension of Kirkenes TMA in Finnish airspace (implementation end of 2016)</p> <p>Implementation of NEFAB Cross border Service Concept (planned)</p>	<p>Improvement in TMA services, arrival and departure routings at Kirkenes airport</p> <p>Improvement in cost efficiency regarding airspace and service provision</p>	<p>SAF: No</p> <p>CAP: No</p> <p>ENV: No</p> <p>COE: No</p> <p>SAF: No</p> <p>CAP: No</p> <p>ENV: No</p> <p>COE: No</p>	<p>SAF: Med</p> <p>CAP: Med</p> <p>ENV: Med</p> <p>COE: Med</p> <p>SAF: Med</p> <p>CAP: Med</p> <p>ENV: No</p> <p>COE: High</p>

2.8.4.5 Conclusions on economic aspects

NEFAB foresaw large economic benefits in the CBA. These have not materialised to full extent. However, judging from the implemented operational and technical projects, some benefits have been realised. It has not been possible to assess the costs and benefits in the light of reports published by the PRB and NM, as those reports provide no substantial basis on which this could be conducted.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

NEFAB has incurred administrative costs to set up and run the FAB, but has not reported on these costs and these costs can therefore not be assessed.

In terms of technical harmonisation and rationalisation NEFAB has implemented Joint Ancillary Services.

NEFAB is involved in the North European Free Route Airspace (NEFRA) Programme implementation. NEFAB is also continuing participation in the Borealis FRA Programme. It is unknown to NEFAB to which extent FRA is truly used. It has not become clear to the study team if the benefits of FRA can be attributed to the FAB initiative. FRA could have happened regardless of the FAB initiative.

2.9 South West FAB

2.9.1 General information

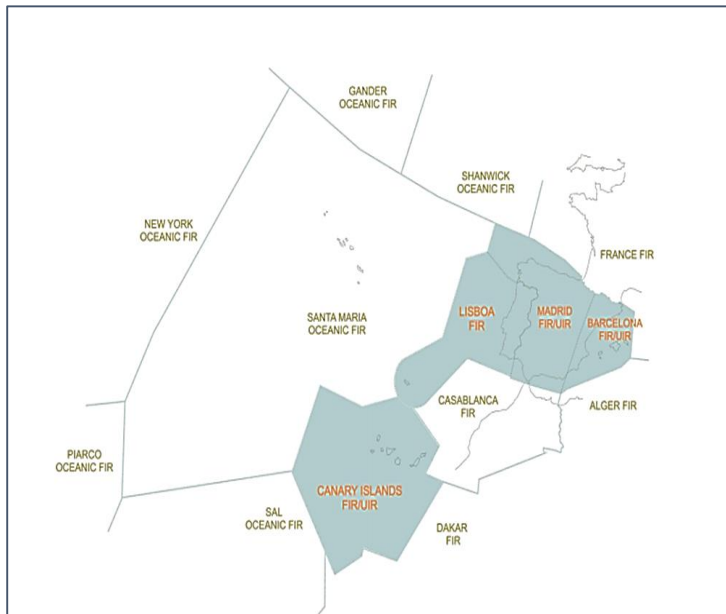
The **South West FAB (SW FAB)** was formally established in May 2013¹⁹⁹. The SW FAB comprises the following constituents:

Table 11 SW FAB overview

Member States	Air navigation service providers	National supervisory authorities
Kingdom of Spain	Entidad Pública Empresarial Aeropuertos Españoles y Navegación Aérea (ENAIRE)	Dirección General de Aviación Civil (DGAC)
Republic of Portugal	Navegação Aérea de Portugal - NAV Portugal	Instituto Nacional de Aviação Civil (INAC, I.P.)

The scope of services within the scope of the SW FAB is defined in Article 17 of the FAB State-level Agreement and includes ATS, CNS, MET, AIS as well as the ASM and ATFM functions.

Figure 26 Geographic scope of the FAB SW



As depicted on the attached map, the SW FAB airspace geographically and vertically covers the following airspace volume: UIR Madrid (FL245 – UNL), UIR Barcelona (FL245 – UNL), UIR Canary Islands (FL245 – UNL) and UIR Lisboa (FL245 – UNL)²⁰⁰. The Santa Maria Oceanic FIR is not included in the scope of the SW FAB.

The four FIRs/UIRs are surrounded by multiple other FIRs thus there are a large number of interfaces to deal with operationally. There is

also ATS delegation between Spain and Portugal along the national borders, aiming at improving operational efficiency.

¹⁹⁹ FAB SW State Agreement

²⁰⁰ FAB SW State Agreement, art. (4)

2.9.2 Institutional and legal arrangements

2.9.2.1 Legal basis

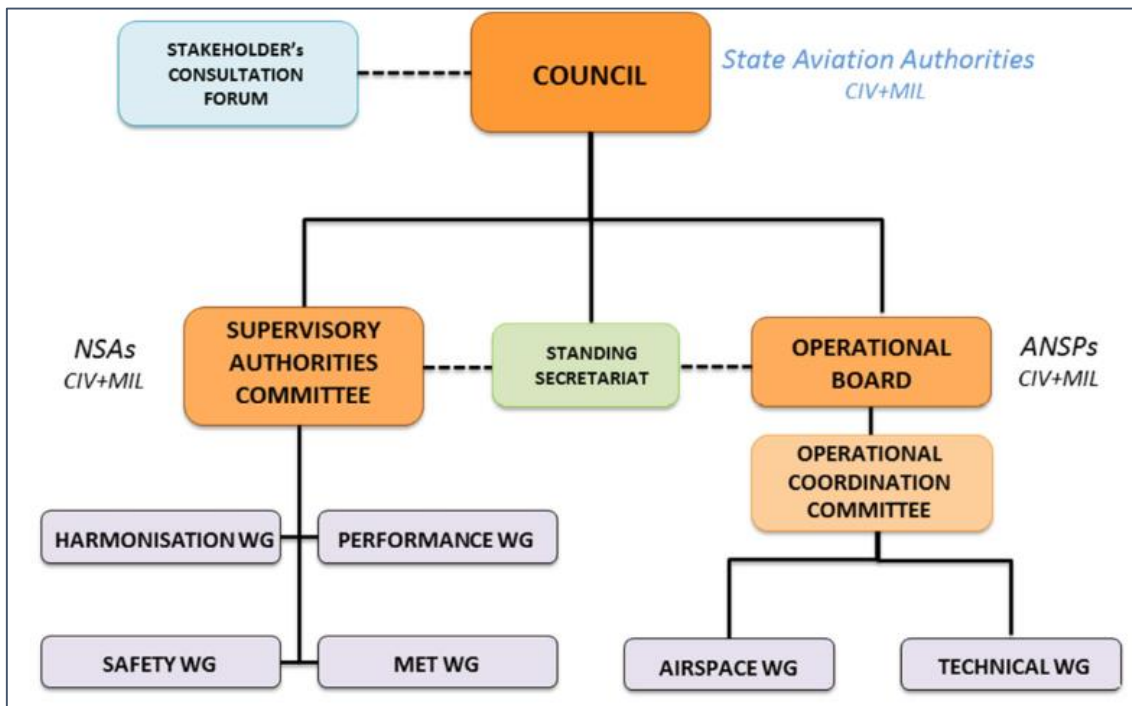
The SW FAB is built upon the following agreements concluded at State, NSA and ANSP level:

- State-level: Agreement between the Portuguese Republic and the Kingdom of Spain on the establishment of the South West Functional Airspace Block (signed 17 May 2013)
- NSA-level: Agreement between the Civil National Supervisory Authorities of the Republic of Portugal and the Kingdom of Spain (signed 17 May 2012)
- ANSP-level: Framework Agreement between Aena and NAV Portugal for the establishment of the SW FAB (signed 18 June 2012)

2.9.2.2 Governance

The responsibility for the SW FAB governance has been organised on State and ANSP level. The following picture presents the FAB SW governance.

Figure 27 Governance structure of the FAB SW²⁰¹



The State-level Agreement defines and establishes the following FAB SW bodies²⁰²:

- SW FAB Council;
- SW FAB Supervisory Authorities Committee; and
- SW FAB Operational Board.

²⁰¹ FAB SW Operational Board Common Plan 2015-2019, page VII

²⁰² FAB SW State Agreement, art. (9)

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The SW FAB Council (the "Council") is the highest governing body, established as a joint decision-making body for the purposes of the implementation, operation and further development of the SW FAB²⁰³. It is composed of one representative from the authority responsible for military aviation and one representative from each Civil Aviation Authority (CAA) of each SW FAB State. From Portugal, the *Autoridade Aeronáutica Nacional* (AAN) and the *Autoridade Nacional da Aviação Civil* (ANAC) and, from Spain, the *Estado Mayor del Aire* (EMA) and the *Dirección General de Aviación Civil* (DGAC) are the four members in the Council.²⁰⁴

The Council chairmanship rotates annually between the two CAAs. Representatives of the Supervisory Authorities Committee and the Operational Board as well as other participants may attend the Council meetings as observers. The decisions of the Council are adopted by unanimity. The Council meets at least twice a year.²⁰⁵

The SW FAB Supervisory Authorities Committee (SAC) addresses all matters related to the supervision, performance and harmonisation of the SW FAB²⁰⁶. It is made up of representatives of each NSA (ANAC, ANMA, SEMA, AESA and EMA), and the military aviation authorities that are not established as NSA. The Supervisory Authorities Committee is alternately chaired, in annual terms, by the representative of the civil NSA responsible for ATS of one of the Parties and co-chaired by the representative of the civil NSA also responsible for ATS of the other Party.

The Supervisory Authorities Committee reports to the Council²⁰⁷ and has four working groups: the Harmonisation WG, the Performance WG, the Safety WG, and the MET WG.

The SW FAB Operational Board (OB), composed of ANSP representatives, addresses all matters related to the technical and operational functioning of the SW FAB²⁰⁸. The Operational Board is chaired alternatively, in annual terms, by the representative from the designated en-route ATS provider from each Party.²⁰⁹

The underlying organisational structure of the Operational Board is as follows²¹⁰:

- the Operational Board Coordination Committee (OCC): mainly responsible for preparing conclusions, recommendations and giving advice to the Operational Board, as well as for monitoring the activities of Working Groups and validating their recommendations;
- the Airspace Working Group (AWG): mainly responsible for identification, harmonisation and development of airspace structure taking into account civil and military air traffic flows, European route network, Network Manager (NM) and Performance Plan at FAB level (SOWEPP), ensuring optimum airspace

²⁰³ Terms of Reference SW FAB Council, art. (2)

²⁰⁴ FAB SW State Agreement, art. (10-11)

²⁰⁵ FAB SW State Agreement, art. (10-11)

²⁰⁶ Terms of Reference SW FAB Supervisory Authorities Committee, art. (2)

²⁰⁷ FAB SW State Agreement, art. (13)

²⁰⁸ Terms of Reference FAB SW Operational Board, art. (2)

²⁰⁹ FAB SW State Agreement, art. (14)

²¹⁰ FAB SW Annual Report 2015, section (4)

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

utilisation and military mission effectiveness in the application of the FUA concept; and

- Technical Working Group (TWG): mainly responsible for proposing activities or plans towards harmonised and interoperable technical systems for the provision of ATM, CNS and MET services by the civil and military ANSPs, providing high level of safety operations and making optimal use of technical resources.

2.9.2.3 NSA cooperation²¹¹

In accordance with the SW FAB NSA Cooperation Agreement of 17th of May 2013, the NSA level cooperation includes the following domains:

- supervision of the ongoing compliance with the common requirements for ANS of the ANSPs providing services in the SW FAB;
- coordination of the NSAs annual inspection and audit programmes;
- safety oversight of the ANSPs providing services in the SW FAB;
- coordination of the notifications of SW FAB safety-related changes, their review and acceptance;
- supervision with regard to interoperability of systems and the capabilities of the ANSPs to conduct the conformity assessment;
- elaboration of national performance plans (NPPs) or, if so decided, of a SW FAB performance plan and ongoing monitoring and supervision of the implementation of the national plans or of the SW FAB plan, as the case may be; and
- production of an annual report about the implementation of the SES legislation, including annual safety reports.

The cooperation is developed and coordinated under the auspices of the Supervisory Authorities Committee (SAC).

Joint inspections are routinely carried out by the civil NSAs, ANAC, IPMA, SEMA and AESA. In these inspections, one or more members of the "non-certifying" NSA's staff are appointed and are part of the oversight team as observer(s). The coordination and exchange of information is foreseen under article 12 of the NSA Agreement and performed in the framework of the SAC and the FAB Safety Working Group.

NSA manuals and procedures are being harmonised through the work of the Harmonization Working Group (HAR WG), one of the four standing working groups that report to the SAC. Thus, the HAR WG deals with the Procedure for Safety Oversight of Air Navigation Service Providers (ANSPs), the Procedimiento de Auditoría de Proveedores MET certificados and the Procedure for the joint review of changes related to the SW FAB, this last one in collaboration with the Safety Working Group (SAF WG), another of the four standing working groups that report to the SAC.

The harmonisation of qualification/training requirements for NSA inspectors is being explored by the SAC as there is much room for development within the SW FAB in this

²¹¹ Information sources: FAB SW NSA Agreement, art. 5; SW FAB response to NSA level data questionnaire; Rules of Procedure (RoPs) of the SW FAB Supervisory Authorities Committee (SAC); Interview with the Spanish NSA, 8 November 2016.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

particular area. The vision, in the long run, is that of a common training process for the SW FAB. In the meantime, a recognition scheme is being explored.

Expertise is shared in the day-to-day management of the SW FAB NSA dimension, in the four standing working groups of the SAC and in the SAC itself. Further to this, civil NSAs are currently performing joint inspections (as planned in the common plan of inspections) as observers but there is a clear intention to go forward in this inspection process inside the SW FAB. This is expected to have a positive and win-win effect in the sharing of expertise between both NSAs.

The review of safety-related FAB changes is managed by the SAF WG. The HAR WG and the SAF WG have produced the *Procedure for the joint review of changes* related to the SW FAB, which was subsequently approved by the SAC. In application of the procedure for the joint review of changes related to the SW FAB, three changes related to the SW FAB have been addressed, namely: Canarias TMA Phase I and its modification and FRASAI (Free Route Airspace in the North-West region of the SW FAB).

The arrangements for the FAB performance plan development are detailed in article 11 of the NSA Agreement. This task is managed by the Performance Working Group (PER WG) in accordance with its Terms of Reference. The PER WG produced the proposal for the RP2 SW FAB Performance Plan (RP2 SOWEPP), which was then adopted by the SW FAB Council. The PER WG does not deal with the approval of ANSP investments within the FAB (though it does the joint review as part of the monitoring of the performance plans).

Although resources in the NSAs are in general scarce, they are sufficient for effectively managing the current SW FAB's NSA dimension. In the particular case of the performance plan development, the PER WG and the SAC have been able to develop the SW FAB performance plan (RP2 SOWEPP) and are now in the process of monitoring its implementation.

That being said, the NSAs of the SW FAB pointed out that the lack of NSA resources across Europe is a common issue, as constantly referred by the EC. This situation also affects the SW FAB, most specially as new regulatory tasks and obligations are difficult to plan with enough time to contract people and train them for the new challenges.

2.9.2.4 Customer engagement, stakeholder consultation and communication

The FAB Agreement provides for the consultation of SW FAB stakeholders through the Stakeholders Consultation Forum²¹².

The Stakeholders Consultation Forum is a consultative body of the Council and meets at least once a year. The role of this body is solely to advise the Council on the implementation of the SW FAB when required. SW FAB stakeholders are invited to the

²¹² FAB SW State level Agreement, art. (11)

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Stakeholders Consultation Forum by the Chair of the Council who also chairs the Stakeholders Consultation Forum²¹³.

The first Stakeholders Consultation Forum (SCF) was held on 2nd June 2015 in Lisbon. This 1st SCF was attended by representatives of the Commission, the Network Manager, associations of airlines, staff, pilots and controllers from both States as well as SW FAB civil and military expert members from SAC and OB.

In general, a positive opinion was transmitted by all stakeholders and specially by the Network Manager in relation to the development of the SW FAB and the Operational Board Common Plan. Interesting suggestions and comments from the SCF attendants were subsequently discussed by the Council. Decisions regarding the increased involvement of airspace users (AUs) and professional staff associations in the operational project development were agreed in order to improve the next SCFs. To carry this out, sectorial meetings with stakeholder participation will be arranged ²¹⁴.

The FAB SW has a webpage providing a comprehensive view of the FAB activities. All the key FAB materials are published on the website, including agreements, terms of reference of FAB bodies, annual reports, FAB plans etc. The documentation on the website is up-to-date. FAB developments are regularly highlighted through news releases. ²¹⁵

2.9.2.5 **Social dialogue**

No information found in the available documentation.

2.9.2.6 **Inter-FAB cooperation and cooperation with third countries**

The SW FAB has expressed its interest in maintaining close contact with other adjacent FABs and third countries. All the projects included in the SW FAB OB CP have as the main objective the improvement of the performance not only inside the SW FAB area of responsibility, but also with collateral FABs and with neighbouring third countries. The FAB Council has emphasised this issue, especially with regard to FABEC due to the need to coordinate the development of some SW FAB operational projects with France ²¹⁶.

Operational cooperation with FABEC was reinforced at the end of June 2016 through new cooperation arrangements consisting of both short and medium term measures, including improvements regarding the operational interface, the upcoming implementation of the ERATO system in Bordeaux, the connectivity of free route airspace and the implementation of Extended Arrival Management.²¹⁷

²¹³ FAB SW State level Agreement, art. (12)

²¹⁴ FAB SW Annual Plan 2015, page 15

²¹⁵ <http://www.swfab.eu/home>

²¹⁶ FAB SW Annual Plan 2015, page 12

²¹⁷ <http://www.swfab.eu/fabec-and-sw-fab-operational-cooperation>

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Furthermore, the SW FAB en route ATS providers, ENAIRE and NAV Portugal, have a long-lasting inter-FAB/regional collaboration in the AEFMP²¹⁸ area (Algeria, Spain, France, Morocco, Portugal) which comprises the French en-route ATS provider DSNA (FABEC) and en route ATS providers of third countries: ONDA Morocco (Morocco) and ENNA (Algeria). The AEFMP was signed in 2002 before the launching of the SES initiative responding to former European ATM harmonization initiatives and contributes to extending regional cooperation beyond the EU and European Civil Aviation Conference (ECAC). Its terms are currently being updated to the SES initiative^{219 220}.

2.9.3 Operational context and status

2.9.3.1 Overview of operational and technical elements

SW FAB	
Geographic scope and traffic features	<ul style="list-style-type: none"> • FIR Lisboa (FL245/UNL), UIR Madrid (FL245/UNL), UIR Barcelona (FL245/UNL), UIR Canary Islands (FL245/UNL) • Portugal has 44% overflights, 51% international arr/dep and 5% domestic; Spain has 29% overflights, 56% international arr/dep and 14% domestic (rounded to 1sf).
Number of States	<ul style="list-style-type: none"> • Two state FAB - Portugal and Spain.
Scope of FAB service provision	<ul style="list-style-type: none"> • En-route ATS in all FIRs/UIRs. Two ANSP provide the CNS systems, AIS.
FAB Business/Implementation Plans	<ul style="list-style-type: none"> • FAB projects are set out in the SW FAB Operational Board Common Plan 2015-2019 which includes the following active projects (completion dates vary between the end of 2016 and end of 2020): <ul style="list-style-type: none"> ○ Network Management improvements, including a SW FAB en-route sectorisation focus to increase airspace capacity. The project also includes improvements to interfaces with Marseille and Bordeaux and general network actions.

²¹⁸ AEFMP was an initiative beginning in the 1990's. See <http://www.aefmp-atm.org/index.php/who-are-we/our-history>.

²¹⁹ SW FAB Operational Board Common Plan 2015-2019, page 29

²²⁰ <http://www.swfab.eu/enhancing-inter-fab-and-third-countries-collaboration>

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

	<ul style="list-style-type: none"> ○ Civil-Military coordination to lead to harmonised ASM and a more collaborative application of FUA. ○ Terminal Area Management (TMA), which covers the introduction of RNAV1 structures in Canarias FIR, Madrid and Barcelona TMAs, and includes the re-organization of ATC sectors and introduction of Performance Based Navigation (PBN). Related to this is investment in new CNS for Faro and Lisbon airports to improve SIDs and STARs. ○ Infrastructure Harmonisation, which includes: CNS collaboration agreement (2012) for the shared use of surveillance data; the development of an interoperable FDP (iTEC industrial collaboration); analysis of common solutions for CDM and ATM systems interfaces between ENAIRE and NAV-Portugal. Concerning CNS there are plans to introduce: datalink (IR29/2009 and IR30/2009), IP based aeronautical data networks; PENS; analysis of ADS-B and WAM feasibility. ○ MET - harmonisation of SIGMETs and other meteorological information supplied en-route.
<p>Airspace configuration / ATFM</p>	<ul style="list-style-type: none"> ● FRA 1 SW FAB Lisbon/Madrid/Brest (FRA): implementation of the Free Route Airspace Concept in the Santiago/Asturias sectors was completed in May 2014 ● As part of the SW FAB strategy for the implementation of the 'Free Routing' concept three cross-border projects are underway in line with the operational requirements of the Commission (Article 2(25) of Regulation (EC) No 549/2004), in particular: the extension of 'Free Routing' to three airspaces, that of Brest in France, Casablanca in Morocco, and Santa Maria (the latter as of March 2016).
<p>Convergence of operational concepts and systems</p>	<p>Planned harmonisation of SW FAB procedures:</p>

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

	<ul style="list-style-type: none"> • Harmonisation of SW FAB airspace classification, which is at FL195 in Portuguese airspace and FL245 in Spanish airspace (2016). • Harmonisation of FL division at cross-border sectorisation, currently at FL345 and FL325 (2019). • Harmonisation of Airspace Classification (2016). • Harmonisation of radar separation (2018).
FAB integration for delivery of the new technology AND Rationalisation of systems and equipment	<ul style="list-style-type: none"> • None identified.
Rationalisation of support services	<ul style="list-style-type: none"> • None identified.

The SW FAB operational highlights are:

- Several free route initiatives have been implemented (Santiago/Asturias sectors completed in 2014, Santa Maria FIR to be completed in 2016) and are also under development in the SW Axis area with significant flight efficiency gains expected from the large dimension of the airspace involved. A task force between DSNA, ENAIRE and NAV Portugal is set to analyse long range direct routes through the airspace of Lisbon, Madrid and Brest ACC to best serve the currently crowded Europe SW Axis. Future plans include extension of FRA into FABEC, Santa Maria Oceanic airspace, Canarias Airspace and possibly Casablanca. The longer term aim is to create the largest FRA in the ECAC area.²²¹
- NMP 3 ATS Network improvements: The review of Appendix 5 of the Route Availability Document (RAD) was completed in November 2014.
- NMP 4 SW FAB En-route sectorisation improvement: a series of actions have been completed within the scope of this new project, which is contained in the new version of the SW FAB OB CP (SW FAB OB CP 15-19), and is divided into various activities related to optimising the sector route structure. These actions are as follows:
 - Implementing the configuration of ten sectors in the Canary Islands ACC: implemented in December 2014.
 - Dividing the Barcelona ACC into cores: implemented in January 2015.

²²¹ FABEC and SW FAB intensify operational cooperation, 18 July 2016

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- Redesigning the CCC sector of the Barcelona ACC: implemented in June 2015, including
- Dynamic sectorisation of BAS/MUS/VVS sectors to optimize flow and capacity management in Barcelona ACC established in July 2015.
- The implementation of the harmonization of the radar separation minima in SW FAB airspace was completed. En-route radar separation reduced to 5NM (except in Oceanic airspace) and TMA radar separation reduced to 3NM.
- Civil-Military coordination is ongoing. Special use areas are being revised, new conditional routes are being implemented and some ATS-routes are being re-aligned. Dissemination of progress on FUA to airspace users is considered an enabler to achieve Flight Planning using more efficient routes through the Civil Use of Release Airspace (CURA) achieved through the FUA process.
- Optimization of sectorisation in Barcelona TMA.
- Deployment of AMAN (Arrival Manager) functionality in the ATM System to facilitate and improve air traffic sequencing into Barcelona Airport (LEBL).
- Several multilateral systems: Lisboa Airport MLAT, Lisboa WAM Extension and Santa María WAM Azores covering central and western groups of Azores islands.
- Within the framework of Civil/Mil Ground Communications improvement, the following communication services: Madrid ACC - Valencia TACC; Barcelona ACC-Valencia TACC; Sevilla ACC- Valencia TACC; Palma de Mallorca ACC-Valencia TACC.

The study has also observed:

The SW FAB en-route ATS providers, ENAIRE and NAV Portugal, have cooperated in the AEFMP area (Algeria, Spain, France, Morocco, Portugal) under an agreement signed in 2002. This agreement is currently being updated to reflect the objectives of the SES.

2.9.3.2 Detailed review

Airspace configuration / ATFM

The airspace managed by NAV Portugal, composed by FIRs/UIRs: Lisbon (EUR Region) and Santa Maria Oceanic (NAT Region), is about 6 million sq. Km. Portuguese FIRs are surrounded by FIRs of 7 States namely Spain (Madrid and Canarias FIR's), Morocco (Casablanca FIR), Cabo Verde (Sal Oceanic FIR), United States (New York Oceanic FIR), Trinidad & Tobago (Piarco FIR), Canada (Gander Oceanic FIR) and Ireland/UK (Shanwick Oceanic FIR).²²²

Surrounding the airspace of Spain, there are 10 FIRs controlled by 7 States (namely France (Brest, Bordeaux and Marseille), United Kingdom (Shanwick), Portugal (Lisboa and Santa Maria), Morocco (Casablanca), Algeria (Alger), Cape Verde (La Sal) and Senegal (Dakar)) belonging to three ICAO regions, which makes this area a transition either to Africa or South America. This leads to some capacity limitations, hence Spain is consolidating its presence in the South Atlantic corridor through the participation in cooperation programmes for the enhancement of CNS/ATM to increase capacity in.

²²² LSSIP Portugal, 2015 – Level 1

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Examples of this strategy are the extension of voice and radar communications networks using satellites (CAFSAT project) and the implementation of Navigation satellite systems (EDISA / SACSA). In turn, the Madrid FIR/UIR includes the airspace delegated to Seville, south of parallel 39° North. Within each FIR, the airspace in which the airways converge close to one or more airports is called Terminal Areas (TMA). In the Spanish airspace there are 12 TMAs. The Division Flight Level (DFL) separating upper from lower ATS airspace is FL245.²²³

Convergence of operational concepts and systems

CNS projects include:

- Evolution of the Aeronautical Messaging Networks (AMHS): The AMHS connection was established three months before schedule (phase one, with bilateral traffic, on 4 September 2014 and phase two, with all traffic, on 30 September 2014).
- IP Interconnection: The first operational IP services using the already implemented IP interconnection came on stream with the introduction of the FMTP service between Lisbon and Madrid on 4 June 2014 and subsequently with the introduction of the AMHS service on 10 September 2014.

Performance scheme²²⁴

- Safety: the FAB targets submitted for RP2 are consistent with European wide target.
- Environmental: Flight efficiency - The target for horizontal flight efficiency (KEA) in 2015 was 3.85% and that achieved 3.39%.
- Capacity: En-route ATFM delay per flight - The target for en-route ATFM delay in 2015 was 0.3min per flight and that achieved 0.46min per flight.
- Cost: The PRB's RP2 assessment report has judged the cost efficiency of SW FAB (submitted by States individually) to be consistent with the EU level targets.

2.9.4 Assessment of economic aspects

2.9.4.1 FAB CBA analysis

In the CBA, SW FAB identifies ANSPs, airspace users as their main stakeholders. Externalities, including environmental impact, have also been taken into account.

SW FAB has estimated improvements stemming from operational collaboration as well as from systems collaboration. Operational projects are listed below²²⁵.

²²³ LSSIP Spain, 2015 – Level 1

²²⁴ PRU Dashboard – RP2 - http://www.eurocontrol.int/prudata/dashboard/rp2_2015.html

²²⁵ Ministerio de Fomento & INAC, 2012, SW FAB Compliance Summary Document

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Operational projects:

OPERATIONAL PROJECT (PHASE I)	SAF	CAP	EF	ENV	NS&D	ASM	PM	INT
RESTRUCTURING OF AIRWAY UN-733/A-33	H	L	M	L	-	H	L	-
NEW ROUTE OPTION FOR NW TRAFFIC FROM/TO LEMG	-	M	H	L	-	L	M	-
NEW CROSS BORDER BOUNDARY LIMIT DEFINITION & NIGHT DIRECT ATS ROUTE NETWORK	-	-	M	M	-	H	M	-
SANTIAGO/ASTURIAS FREE ROUTE AIRSPACE	-	L	H	M	-	H	M	M
OPERATIONAL PROJECT (PHASES II & III)	SAF	CAP	EF	ENV	NS&D	ASM	PM	INT
FIR/UIR CASABLANCA DUALISATION PROJECT	H	M	H	M	-	H	M	-
RESTRUCTURING OF MAIN INTERFACE BETWEEN SW FAB/MARSEILLE	M	M	L	L	-	M	L	M
SW FAB FREE ROUTE AIRSPACE CONCEPT PHASE II	L	L	M	M	-	H	M	-
SW FAB FREE ROUTE AIRSPACE CONCEPT PHASE III	L	L	M	M	-	H	M	-

Figure 6- Qualitative benefits vs. KPIs per operational project

⁸ Impact in the project: (-) not addressed; (L) Low impact; (M) Medium impact; (H) High impact.

⁹ The Key Performance Indicators (KPIs) are: Safety (SAF); Capacity (CAP); Flight efficiency (EF); Environment (ENV); National Security & Defence requirements (NSD); Airspace organisation & management (ASM); Performance management (PM) and Interaction with other FAB's (INT).

SW FAB has calculated the NPVs for two scenarios. The results are presented in the table below.

SW FAB		Scenario 1	Scenario 2
ANSPs' savings	NPV (€)	-149.943	-180.410
Airspace users' savings		54.621.036	56.509.110
Externalities' savings		296.219	518.462
Savings in the period 2012-2021 considering all effects		54.767.312	56.847.162

Figure 9- Overview of financial effects in the period 2012-2021 (results expressed using NPV)

SW FAB indicates in the document that only costs for ANSPs are reflected, because for the systems collaboration between NAV Portugal and AENA the CBA only assessed qualitative benefits. Quantitative benefits remained to be determined until Spain and Portugal agreed on the scope of collaboration in this respect. To date, the study team has not been informed on the quantification.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The CBA also stated that the larger benefits come from FRA. SW FAB also foresaw high potential for cost reduction considering the high costs associated with the development of ATM/CNS systems. SW FAB indicated that several agreements and arrangements concerning the collaboration for achieving harmonised and interoperable technical systems on a cost-efficient deployment of infrastructure for the provision of CNS/ATM services have been concluded.

SW FAB declined to give a response to the ANSP level data collection questionnaire. It is therefore not clear whether any benefits have materialised, but, from desk research it seems unlikely that the results so far align with the CBA.

2.9.4.2 Performance in cost-efficiency KPA (actual performance RP 1)

The performance in terms of cost efficiency during RP1 is provided in the following table. Cost efficiency was only reported on individual ANSP level during RP1. Data for 2015 (first year RP2) are not yet available. Values in red indicate the actual rate was higher than the target.

	2012		2013		2014	
	Target	Actual	Target	Actual	Target	Actual
Portugal	€ 34.49	€ 39.29	€ 34.49	€ 35.06	€ 34.14	€ 32.71
Spain (Continental)	€ 70.08	€ 73.08	€ 69.44	€ 67.63	€ 66.92	€ 63.83
Spain (Canarias)	€ 61.48	€ 64.54	€ 59.54	€ 64.43	€ 56.84	€ 63.98

Source:PRB Annual Monitoring Reports; Ecorys

2.9.4.3 Unit rates RP 2, unit costs and charging zones

SW FAB has not reported level their cost-efficiency targets on FAB. The study team presents them below, per en route charging zone²²⁶.

Portugal:

Portugal En-route Cost-Efficiency Targets		2015	2016	2017	2018	2019
Cost efficiency KPI 1:	Nominal en-route determined costs	111.710	117.510	121.528	124.852	128.310
	Inflation index (base 2012)	102.32	103.85	105.41	106.99	108.59
En-route DUC Portugal	Real en-route determined costs	109.182	113.152	115.293	116.695	118.155
	Total en-route Service Units (000)	3,190	3,202	3,219	3,245	3,269
	Real (EUR 2012) en-route DUC	34.23	35.34	35.81	35.96	36.14

NOTE: Costs in MEUR, service units in thousands (000). Costs in real terms expressed in 2012 EUR.

²²⁶ 2015-2019 South West FAB Performance Plan RP2 SOWEPP, 2014

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Spain (Continental and Canarias):

Spain En-route Cost-Efficiency Targets		2015	2016	2017	2018	2019
Cost efficiency KPI #1: En-route DUC Spain - Canarias	Nominal en-route determined costs	98.619	98.845	99.102	98.596	98.431
	Inflation index (base 2012)	102.63	103.55	104.63	105.70	106.81
En-route DUC Spain - Canarias	Real en-route determined costs	96.093	95.457	94.716	93.281	92.154
	Total en-route Service Units (000)	1,531	1,528	1,531	1,537	1,543
	Real (EUR 2012) en-route DUC	62.77	62.47	61.87	60.69	59.72
Cost efficiency KPI #1: En-route DUC Spain - Continental	Nominal en-route determined costs	623.000	624.746	625.012	628.443	630.733
	Inflation index (base 2012)	102.63	103.55	104.63	105.70	106.81
En-route DUC Spain - Continental	Real en-route determined costs	607.048	603.330	597.351	594.560	590.508
	Total en-route Service Units (000)	8,880	8,936	9,018	9,128	9,238
	Real (EUR 2012) en-route DUC	68.36	67.52	66.24	65.14	63.92

NOTE: Costs in MEUR, service units in thousands (000). Costs in real terms expressed in 2012 EUR.

The unit rates of route charges applicable to December flights (in €, based on November 2016 exchange rates) for the FAB member states are as follows:

Spain:71.78
Portugal:10.89

SW FAB embodies 3 en route charging zones: Portugal Lisboa; Spain Continental and Spain Canarias. There are 2 terminal charging zones: Portugal and Spain. The study team did not receive an ANSP response to the survey. It is therefore unknown if there are concrete initiatives for a common charging zone.

2.9.4.4 Resource-efficiency measures in core services and support services

The study team asked in the ANSP level data collection questionnaire to which extent resource efficiency measures have been undertaken in the frame of SW FAB. The study team has not received a response from SW FAB and can therefore not reflect upon this issue.

2.9.4.5 Conclusions on economic aspects of the FAB

The SW FAB foresaw large economic benefits in the CBA. These have not materialised to full extent. However, judging from the implemented operational and technical projects, some benefits have been realised. It has not been possible to assess the costs and benefits in the light of reports published by the PRB and NM, as those reports provide no substantial basis on which this could be conducted.

The SW FAB has incurred administrative costs to set up and run the FAB, but has not reported on these costs and these costs can therefore not be assessed.

In terms of technical harmonisation and rationalisation, the SW FAB has implemented Common CSN infrastructure.

The SW FAB completed the implementation of the Free Route Airspace Concept in the Santiago/Asturias in May 2014. Other cross-border FRA concepts are planned, but have not been implemented. It has not become clear to the study team if the benefits of FRA can be attributed to the FAB initiative. FRA could have happened regardless of the FAB initiative.

2.10 UK-Ireland FAB

2.10.1 General information

The **UK-Ireland FAB** was established in July 2008 and was the first FAB to be operationally active. The table below outlines the constituent entities of the FAB:

Member States	Air navigation service providers	National supervisory authorities
Ireland	Irish Aviation Authority (IAA) – ANSP	Safety Regulation Division of the Irish Aviation Authority (IAA)
United Kingdom of Great Britain and Northern Ireland	NATS	UK Civil Aviation Authority

Figure 28 UK-IRL FAB geographic scope



The geographic scope of the FAB is presented on the attached map.

The air navigation services included in the remit of the UK-Ireland FAB comprise ATS and CNS (indirectly, impacted by individual FAB projects). MET and AIS are not currently part of the FAB activities.

2.10.2 Institutional and legal arrangements

2.10.2.1 Legal basis

The implementation of the UK-Ireland FAB is underpinned by the following legal instruments:

- *Memorandum of Understanding in relation to the establishment of a Functional Airspace Block between the Government of United Kingdom of Great Britain and Northern Ireland and the Government of Ireland* (signed 25 January 2012)

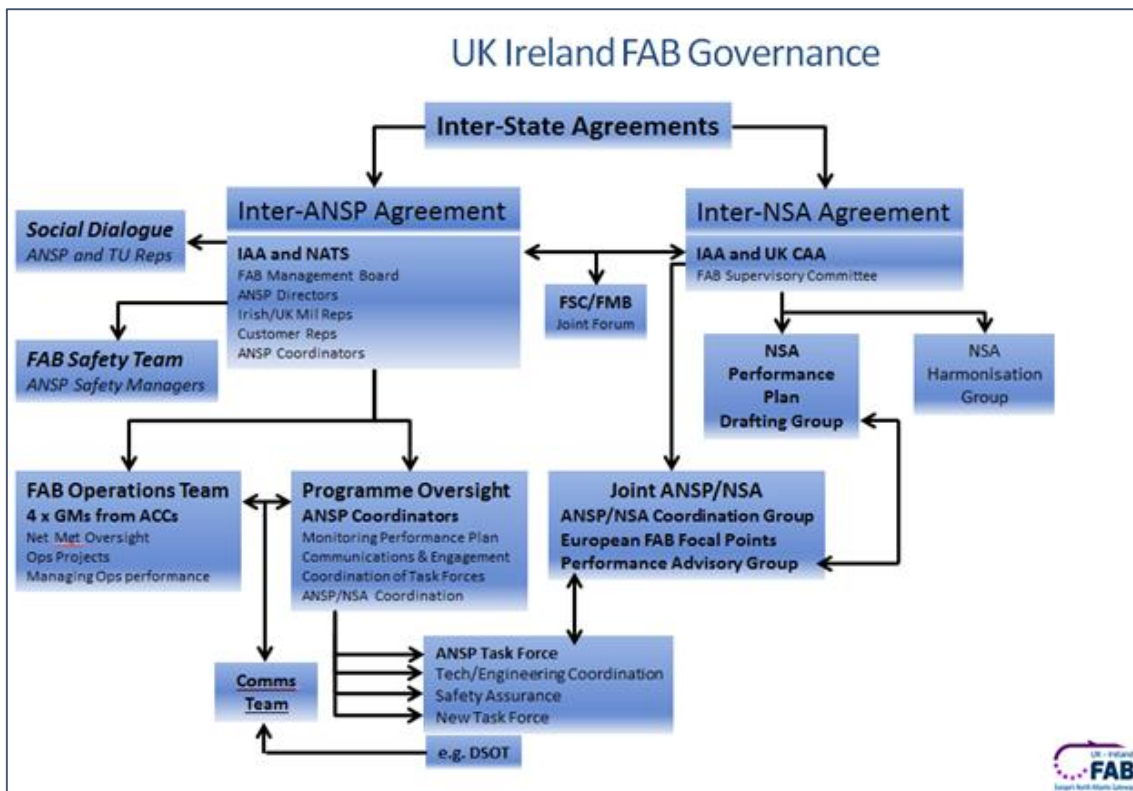
Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

- *National Supervisory Authority Memorandum of Understanding between the UK Civil Aviation Authority and the Safety Regulation Division of the Irish Aviation Authority (signed 25 January 2012)*
- *Memorandum of Understanding between NATS (En Route) Public Limited Company (NATS) and the Irish Aviation Authority (IAA) relating to a UK/Ireland Functional Airspace Block (signed 12.06.2008)*
- *Addendum to Memorandum of Understanding between NAST (En Route) Public Limited Company (NATS) and the Irish Aviation Authority (IAA) relating to a UK/Ireland Functional Airspace Block (FAB) (signed 25 January 2012)*

2.10.2.2 Governance²²⁷

The institutional structure and governance mechanisms of the UK-Ireland FAB are outlined in the chart below:

Figure 29 Institutional structure of the UK-Ireland FAB



At State/NSA level, the main FAB governance structure is the FAB Supervisory Committee (FSC), composed of representatives of the two NSAs who are mandated by their respective State governments. The FSC provides regulatory oversight on behalf of the States, and manages the activities of the NSA Harmonisation Working Group.

The day-to-day management and implementation of the FAB activities is provided by the FAB Management Board (FMB), co-chaired by the ANSPs (IAA and NATS), and including

²²⁷ Information sources: UK-IRL FAB response to ANSP-level data collection questionnaire of the FAB study; UK-IRL FAB website; UK-Ireland FAB Documentation to confirm compliance with IR 176/2011 (submitted in connection with FAB establishment), March 2012

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Military and Airline representatives. The FMB is co-chaired by the NATS and IAA Directors of Operations who oversee the implementation and performance management of the FAB and, in particular, the work of the four subgroups in charge of airspace design, service provision, safety and technology.

FMB decisions are made on a consensus basis. The Joint Chairs have the ultimate responsibility to decide whether a specific FAB proposal should be recommended for implementation by their respective companies.

The FMB does not have executive powers, i.e. it does not alter the direct responsibility of each ANSP to manage the UK and Ireland FIRs respectively. The Joint Chairs of the FMB report to their respective Chief Executive Officers to seek approval for the implementation of any proposed UK-Ireland FAB initiative. The CEOs will, in turn, ensure that appropriate briefing is given to company Boards, Trade Unions and Shareholders. In the unlikely event that a consensus is not achieved, the Joint Chairs of the FMB will agree on the appropriate action to take after having consulted with their respective Chief Executives.

The FAB governance structure also includes the joint ANSP/NSA Performance Advisory Group, a joint ANSP/NSA Coordination Group, and the UK-Ireland FAB representation on the European FAB Focal Point Group. One area of note is that there are a number of smaller working groups which feed into this formal structure and manage individual work programmes.

Airline representatives act as the Co-Chair of the Services Provision Working Group (SPWG). The Working Groups for Airspace Design (ADWG), Safety (SWG), and the Technology Coordination Group (TCG) are Co-Chaired by representatives from the IAA and NATS. The Co-Chairs of each Working Group are members of the FMB and participate in the consensus-based decision making process.

The Irish and UK Military are members of the FMB, and participate as required in Working Groups, with active participation in the Airspace Design Working Group. Staff representatives participate directly in the Working Groups, in particular the activities of the ADWG and SPWG.

In addition, there is a Co-chair Coordination Committee (or C3) which aims to foster progress at all levels: the C3 considers proposals for the FMB. The coordination of activities is also provided by the Joint FAB Secretariat.

2.10.2.3 NSA cooperation²²⁸

The NSA cooperation within the UK-Ireland FAB is articulated through the FAB Supervisory Committee (FSC) and a number of supporting groups. Its aim is to provide the formal coordination and interface forum between the two NSAs on all matters relevant to the FAB. As such, the FSC will normally meet at 6-months intervals, but more

²²⁸ Information sources: MoU between the UK and IRL NSAs; UK-IRL response to NSA-level data collection questionnaire of the FAB study; UK-IRL FAB Implementation Plan and FAB Plan Update 2016; Telephone interview with CAA UK, 3 November 2016

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

frequently if required. Through the FSC, the NSAs oversee the ANSP plans and coordinate advice to Governments.

As regards the oversight of FAB changes and activity, the NSAs have established close coordination at the FAB Supervisory Committee (FSC) level – the oversight is performed by each NSA individually in each State. The process of coordination has been specified in a joint NSA guidance document entitled “UK/Ireland FAB NSA Cooperation Process”.

The tactical planning and coordination of audits timing and themes are exchanged between NSAs at the FAB Harmonisation Working Group level (a sub-Group of the FSC). The relevant outcomes and findings from audits, which are common and affect the FAB performance, are shared and exchanged.

The UK and Ireland have committed to exchanging relevant safety data and information with a view to improving knowledge and contributing to performance-based oversight techniques, which both party are transitioning to apply fully. The UK and Ireland also operate a bilateral Safety Partnership, which meets half-yearly (or when required) and exchanges safety data on Aviation matters beyond CNS/ATM and ANS.

For joint action relating to FAB changes or other FAB related actions, both NSAs apply jointly the conditions and arrangements set out in the applicable common guidance document. The NSA role and tasks are defined and referenced, and take account of the Safety Management Arrangements drafted and agreed jointly (at CEO level) by the ANSPs.

Both NSAs have mature and aligned oversight philosophies and processes (e.g. performance-based oversight approach). Both have agreed to develop their procedures and processes and accordingly to match the developments in the FAB as driven by the ANSPs through a ‘design and build’ approach.

Further developments are promoted through the close relationship of the FSC (NSAs) and FAB Management Board (ANSPs): this interaction triggers change actions to develop specific processes or procedures for both ANSP and NSA levels in a coordinated, focussed and timely manner.

Each NSA ensures that the qualifications of its inspectors match the SES and EASA requirements. There is common training planned (e.g. training for managers and staff on Just Culture) and cooperation in respect of audits (see below) helps align standards and approaches further and gain experiences in different FAB scenarios.

The NSA inspectors of each NSA attend audits of ACCs in each State in order to supplement local inspectors and resources, this being a regular and on-going process. The UK supports the IAA in the area of oversight of meteorological services and is exploring the same level of active support in respect of Instrument Flight Procedure Design services. The FAB Harmonisation Working Group has undertaken a high level ‘work analyses of regulatory roles and tasks done in each NSA. This action enables potential for enhanced future cooperation and possible shared resources to be identified and actioned.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The FSC has within the Governance of the UK-Ireland FAB a Working Group guiding the development of the FAB Performance Plan and monitoring its outcome and outturn. The UK has a Service Licence it gives to NATS to control its provision of en route services and this requires regular reports on performance against their Service and Investment Plans, which are designed, in part, to provide the outcome required by the FAB Performance Plan and NATS contribution to the FAB plan.

The available NSA level resources are deemed to be adequate to meet the demands of the FAB.

As regards future FAB level priorities, the NSAs of UK and Ireland expect the next major activity to focus on the interface with and oversight of the introduction of Free Route Airspace initiative to be implemented through the Borealis Industrial Alliance. As the action is not FAB driven, but an industrial cooperation, regulatory interface is done in coordination with the other NSAs from across the covered area. Accordingly, a 9-States NSA Group has been established and comprises all the NSAs within the BOREALIS geographic scope (incl. Iceland).

2.10.2.4 Customer engagement, stakeholder consultation and communication²²⁹

Customer engagement includes the direct participation of airspace user representatives in the UK-Ireland FAB governance. Two commercial airspace user representatives (one representing short haul carriers and one representing long haul carriers) are hence full members of the FAB Management Board. Customer representatives also take part in FAB working groups.

The output from the FAB activity is shared with customer representatives as well as published on the FAB website. In addition, FAB projects are subject to normal communications, consultation and engagement processes (e.g. survey, bi-lateral meetings) as per standard NATS and IAA processes.

The UK-Ireland FAB website²³⁰ provides comprehensive information on the key FAB projects and developments, the FAB objectives and essential facts. The website includes advanced features such as a video presentation of the FAB concept and of the UK-Ireland FAB activities. A number of FAB documents are published on the website, although the most recent documentation is not available.

2.10.2.5 Social dialogue

Social Dialogue mechanisms meetings are foreseen as part of the FAB governance arrangements, in the form of a bi-annual Social Dialogue meeting opportunity under the FMB as well as separate social dialogue initiatives within each ANSP.²³¹

²²⁹ Information sources: UK-IRL FAB response to ANSP level data collection questionnaire of the FAB study; Presentation of the UK-IRL FAB at the FAB study Workshop on 29 November 2016.

²³⁰ <https://www.ukirelandfab.eu/>

²³¹ UK-IRL FAB response to ANSP-level data collection questionnaire of the FAB study

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

However, there is no evidence available at this stage that the foreseen option for FAB level social dialogue would have been regularly applied in practice.

2.10.2.6 Inter-FAB cooperation and cooperation with third countries ²³²

NATS and the IAA are both members of the BOREALIS Industry Partnership of ANSPs.

There has been cooperation with FABEC at ANSP level, comprising an extension of the Heathrow Arrivals Management project.

2.10.3 Operational context and status

2.10.3.1 Overview of operational and technical elements

UK-IRL FAB	
Geographic scope and traffic features	<ul style="list-style-type: none"> The geographical scope is the en-route airspace within the Irish and UK FIRs, including NOTA and SOTA but formally excluding Oceanic and Terminal airspace²³³. The UK has 16% overflights, 68% international arr/dep and 17% domestic (rounded to 1sf); Ireland has 56% overflights, 43% international arr/dep and 1% domestic.
Number of States	Two state - Ireland and UK.
Scope of FAB service provision	En-route ATS, TMA, Multiple Airports (in UK under commercial contracts to airports). <ul style="list-style-type: none"> AIS. Relay of MET data from UK and Ireland Met Offices.
FAB Business/Implementation Plans	2006/2008 CBA and business plans identified annual saving of fuel burned and reduced CO ₂ . Additional studies to confirm Technical support savings. <ul style="list-style-type: none"> Subsequent business / implementation plans ²³⁴ have identified common Safety Management approached, NSA co-operation on items such as Safety audits. National planning at the State-level is co-ordinated, which States conducting stakeholder reviews.

²³² Based on UK-IRL FAB response to ANSP-level data collection questionnaire of the FAB study

²³³ UK-Ireland FAB Plan 2012-15, 12/5/2012.

²³⁴ UK-ILR FAB Implementation Plan Update March 2016.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Airspace configuration / ATFM	Conventional sectors with TMAs to manage the dense airport arrangements within the region. Increasing use of FRA for all overflights e.g. Rathlin & Central Sectors.
Convergence of operational concepts and systems	2016 Plans have reported successful trials of Dynamic Sectorisation/Capacity Management under which Sectors could be managed from partner centres.
FAB integration for delivery of the new technology AND Rationalisation of systems and equipment	The iTEC and COOPANS systems (the Flight Data processing systems used by NATS & IAA respectively) are being developed in collaboration with other ANSPs and the systems manufacturers, to deliver the feasibility and options for improving the resilience of the delivery of Air Traffic Services to ensure levels of service are maintained across the FAB in the event of unforeseen events. Trials are due to complete in 2016. The Partners also contribute to the Borealis programme of work.
Rationalisation of support services	Extensive work to achieve common approach to Safety Management. The partnership is established and safety data sharing with access to each States' occurrence reports and database is in place and active.

The UK IRL FAB operational highlights are:

- A recent focus on working together to bring forward SESAR concepts: Dynamic Sectorisation (DSOT, Dynamic Sectorisation Operational Trial); Extended Arrival Management (XMAN) trial; and capacity management the outcome of which is a FRA structure for the Rathlin and Central sectors. The Capacity management is in service since March 2015.
- Common Procedures for the Oversight of Changes to the ATM systems. The NSA oversight process is compatible with and complementary to the SMA and the validation of the SMA from DSOT will further inform the work and the reference documentation to further harmonise the procedures of the FAB NSA oversight process. The NSAs jointly contribute, benefit and pre-prepare their future harmonised procedures from the shared deployment of a CAA (SARG) staff member to EASA, on the design and drafting task force on Safety Assessment of Changes to the Functional Systems. The outcome of this task force is intended (by EASA) to form a key component of the EASA ATM/ANS IR proposals.
- Exchanges of Regulatory Personnel in Safety Audits.
- Co-operative Preparation for EASA Safety Audits.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The study has also observed:

- The benefits of network improvements have been achieved. The initial business case identified greater efficiency in exit/entry to the Shanwick Oceanic Region, improved routing within the FAB regions and better overflight routing for flights to the continental European FIRs. The target was to achieve annual savings of €36.2m for operators in the form of reduced fuel used and reductions of 111,000 Kg of Carbon Dioxide emissions. Reported benefits of fuel and track mile savings to customers and associated cost and environmental benefits have been estimated at over €300m out to 2020.
- The FAB has explored a number of cooperation areas that have not been taken further as there was no performance impact foreseen:
 - Joint training provision
 - Joint procurement
 - Joint maintenance
 - Synchronized lifecycles of ATM systems
 - Common CNS infrastructure developments
 - Rationalised capex for long term ATM developments
 - Coordinated AIS
 - Joint control centres

2.10.3.2 Detailed review

Airspace configuration / ATFM

- A study of Harmonised Transition Altitude (TA) in 'Low Density Low Complexity Airspace' as part of the 'Future Airspace Strategy'.
- A single 'Integrated FAB Network Management' has been operational since April 2013. This has led to enhanced capacity management. This activity brought FTE and operational benefit. Even though these are not quantified, estimated benefits are between 1M to 5M €.

Convergence of operational concepts and systems

- Point Merge at Dublin airport, implemented December 2012 and related to the FAB in that the project involved substantial support and collaboration from the UK CAA and Military. The effect has been to increase arrival rates and enable Continuous Descent Approaches (CDAs) to Dublin airport, reducing the amount of airborne holding. Related to this a new air route for traffic departing from Dublin across the North Wales Military Training Area (NWMTA) was introduced to help reduce congestion, particularly during the busy morning period
- The Dynamic Sectorisation Operational Trial (DSOT), to enable ACC areas of responsibility to be flexibly adjusted, allowing resource to be deployed to meet changing traffic patterns. This also draws on a TEN-T funded study for the FAB completed in 2012 which recommended dynamic sectorisation as a means to improve

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

performance. The project has 2 phases, where the first is a full system reconfiguration and the second is implementing new tools.

- We also note the Heathrow Arrival Management Trial (April 2014 – Oct 2015), in the context of SESAR XMAN, which is linked to the FAB and also FABEC cooperation. The inclusion of FABEC extends the effective area of the procedure and estimated benefits are between 1M to 5M € per year²³⁵.

Rationalisation of systems and equipment

The FAB brings together the iTEC and COOPANS²³⁶ systems, and so provides the opportunity for technical cooperation of independent design ATM Systems. It is noted that NATS and the IAA have been following different technological paths, particularly FDP, and hence the focus is on achieving full interoperability rather than future harmonisation, which would mean significant investments being written off.

We note that the dynamic sectorisation trial also demonstrated the connectivity between iTEC & COOPANS FDP, a support to the future implementation of SESAR concepts across the FAB.

Rationalisation of support services

- A proposed plan to develop AIS under Borealis, currently being reviewed by partners.

Performance scheme²³⁷

- Safety. The PRB's RP2 assessment report judged safety targets to be consistent with the EU level for all States/FABs.
- Environment. The target for horizontal flight efficiency (KEA) in 2015 was 3.36% and that achieved 3.47%²³⁸.
- Capacity. The capacity target in 2015 was 0.25 min that achieved 0.08 min.
- Cost efficiency. The PRB's RP2 assessment report²³⁹ judged the cost efficiency of UK-IRL FAB (submitted by States individually) to be consistent with the EU level targets.

2.10.4 Assessment of economic aspects

2.10.4.1 FAB CBA analysis

The CBA²⁴⁰ carried out for UK-Ireland FAB was conducted in 2011-2012. It comprises the timeframe 2008-2020. Operational projects implemented by the FAB should result in customer financial savings.

In summary the CBA indicates:

²³⁵ UK-IRL FAB Interview 22/11/16.

²³⁶ Supplementary information from Appendix III of DK-SE FAB - COOPANS CO-Operation of Air Navigation Service providers: IAA, LFV, Naviair, AustroControl and CroatiaControl.

²³⁷ PRU Dashboard – RP2 - http://www.eurocontrol.int/prudata/dashboard/rp2_2015.html

²³⁸ PRU Dashboard – RP2 - http://www.eurocontrol.int/prudata/dashboard/rp2_2015.html

²³⁹ PRB Assessment Report of RP2 FAB Performance Plans – Volume 1 – Union-wide view

²⁴⁰ IAA & NATS, UK-Ireland FAB Cost-Benefit Analysis, 2012.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- In the baseline scenario, the total cumulative enabled savings from 2008-2020 amounts to €336.5m. The CBA estimated that by 2012 customers would save already €26.6m (fuel savings, emission charges savings, reduced maintenance and crew costs). The largest share of savings is from improved flight efficiency (fuel savings, 70%). Delay reduction benefits are providing 24% of savings.
- From 2008 – 2011, the estimated ANSP costs associated with the FAB are €9.4m. In 2020 these ANSP costs would accumulate to €20.3m. From 2013 onwards, costs related to ANSP are estimated to range between €0.9m-€1m, which is lower than ANSP costs between 2009-2012.
- Based on the customer savings and the ANSP costs, estimated NPV in 2020 for UK-Ireland is €176.1m.
- Qualitative benefits result from, for example, enhanced safety and safety harmonisation; More effective tactical and strategic planning between the ANSPs; More efficient network management; Enhanced coordination on airspace design and cross-FIR airspace management; and Collaborative Technical opportunities and SESAR alignment.

In the ANSP level data collection questionnaire, the FAB ANSPs indicated that the benefits as foreseen in the CBA are materializing:

- Flight efficiency: with ongoing development, via projects as XMAN Heathrow, Point Merge Heathrow and FRA in the Irish FIR. It can't be assessed fully if this matches with the estimated benefits of annually € 20 million per year on short term on average.
- Delay: Heathrow Arrival management has delivered delay reductions as planned. Point Merge at Dublin has optimised arrival sequencing. Increased capacity in sectors across the FAB through cooperation and dialogue. Again, the response does not detail if this resulted in the average annual benefit of around € 7 million per year for users.

2.10.4.2 Performance in cost-efficiency KPA (actual performance RP 1)

The performance in terms of cost efficiency during RP1 is provided in the following table. Cost efficiency was only reported on individual ANSP level during RP1. Data for 2015 (first year RP2) are not yet available. Values in red indicate the actual rate was higher than the target.

	2012		2013		2014	
	Target	Actual	Target	Actual	Target	Actual
Ireland	€ 30.77	€ 28.48	€ 30.00	€ 27.26	€ 29.31	€ 25.59
United Kingdom	€ 68.99	€ 69.34	€ 69.13	€ 73.25	€ 66.36	€ 65.19

Source: PRB Monitoring reports

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

2.10.4.3 Unit rates RP 2, unit costs and charging zones

The following determined unit costs for RP 2 apply on FAB level, based on the FAB performance plan.

	2015	2016	2017	2018	2019
TSUs	14,226,600	14,484,624	14,696,288	14,942,878	15,202,135
Real en route UCs/DUCs (in € 2012 prices)	63.99	62.01	60.46	58.01	55.34
Trend in real en route UCs/DUCs (in € 2012 prices) %_{n/n-1}	-8.62%	-3.09%	-2.51%	-4.06%	-4.60%
Real en route UCs/DUCs (in € 2009 prices)	53.85	52.23	50.96	48.94	46.72
Trend in real en route UCs/DUCs (in € 2009 prices) %_{n/n-1}	-8.51%	-3.02%	-2.43%	-3.96%	-4.54%

Source: FAB UK-Ireland Performance plan RP2

The unit rates of route charges applicable to December flights (in €, based on November 2016 exchange rates) for the FAB member states are as follows:

UK:84.17

Ireland:29.76

Charging zones:

- en route charging zones: 2 (UK, Ireland)
- terminal charging zones: 4 (Ireland, UK - Zone A, UK Zone - B, UK Zone – C)

FAB UK-Ireland indicates regarding a common FAB level charging zone that it has been considered but not seen as desirable so it has not been pursued.

2.10.4.4 Resource-efficiency measures in core services and support services

The FAB UK-Ireland commented on the different resource efficiency measures as follows.

- Joint training and training infrastructure of ANS personnel: Reviewed – not progressed - No Impact

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- Joint procurement: Reviewed – not progressed - No Impact
- Joint maintenance: Reviewed – not progressed - No Impact
- Synchronised life cycles of technical ATM systems: Reviewed – not progressed as ANSPs have invested in different Strategic Platforms - No Impact
- Harmonised ATM systems and tools: Interoperable, SESAR compliant strategic platforms have been purchased – the impact has not been specified.
- Rationalised capex which addresses long-term ATM development: Different structure precluded progression - No Impact
- Coordination of ANSPs' investment plans: Relevant FAB Projects accounted for within relevant ANSP Business Plans – impact has not been specified
- Establishment of joint control centres whenever beneficial: Explored and assessed as not beneficial - No Impact
- Common CNS infrastructure developments: Discussed and not pursued - No Impact
- Cross-border service provision or cross-border delegation of ANS: Trialled under the Dynamic Sectorisation Operational Trial project. Operational Trial proved concept but was not intended to deliver benefit beyond future enablement.
- Coordinated AIS provision: Explored but different solutions identified by each ANSP - No Impact
- Joint contingency arrangements: Subject of a current activity looking at feasibility and options around increased resilience

From the response it becomes clear that the ANSPs did not aim at resource efficiency measures in the FAB. This was also clear from the CBA, that also did not indicate that there were benefits anticipated in this area.

2.10.4.5 Conclusions on economic aspects of the FAB

The UK-Ireland FAB foresaw large economic benefits in the CBA. These have not materialised to full extent. However, judging from the implemented operational and technical projects, some benefits have been realised. It has not been possible to assess the costs and benefits in the light of reports published by the PRB and NM, as those reports provide no substantial basis on which this could be conducted.

The UK-Ireland FAB has incurred administrative costs to set up and run the FAB, but has not reported on these costs and these costs can therefore not be assessed.

In terms of technical harmonisation and rationalisation, The UK-Ireland FAB has implemented Harmonised Systems.

The UK-Ireland FAB is increasing the use of FRA for all overflights e.g. Rathlin & Central Sectors. FRA in the Irish FIR is improving flight-efficiency of the FAB. It has not become clear to the study team if the benefits of FRA can be attributed to the FAB initiative. FRA could have happened regardless of the FAB initiative.

3. Stakeholder views

This chapter presents the results of the stakeholder consultation process conducted as part of the study, including the online stakeholder survey and the interviews of stakeholders.

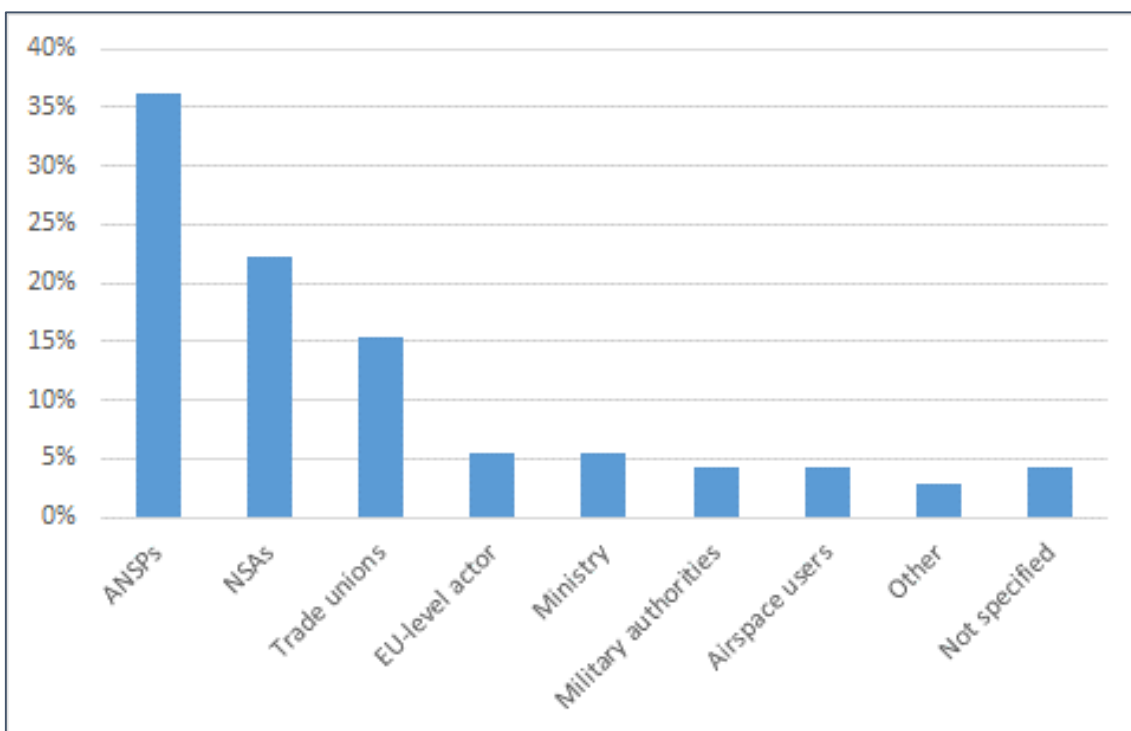
3.1 Stakeholder survey

The online stakeholder survey for this study ran from 31 August to 30 September 2016.

The objective of the online survey was to gather stakeholder views and opinions on the FAB concept and FAB implementation in general (not in relation to specific FABs). This survey was aimed all stakeholder groups. The survey enabled the study team to better understand the status, challenges and opportunities regarding FAB implementation. The scope of the survey was defined in coordination with the European Commission.

In total 56²⁴¹ complete responses and 16 partial survey responses were received from the targeted stakeholders. The distribution of respondents per stakeholder group (as percentage of total responses) is illustrated in the figure below. The largest respondent group is ANSPs, from which 26 responses were received. This is followed by NSAs (16 respondents) and then Trade unions / Staff professional association groups (11 respondents).

Figure 30 Distribution of survey responses per stakeholder group



²⁴¹ Of which 52 online and 4 by email.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Please note that the number of individual survey responses is not directly correlated with the representativeness of the survey results, as a number of respondents submitted their survey on behalf of their wider associations / representative groups, with whom these respondents consulted prior to completing and submitting the survey replies.

In addition to the survey, a number of in-depth, structured interviews of FAB stakeholders were performed. The objective of the interviews was to acquire more detailed information and views from the stakeholders, in order to complement the responses obtained through the survey questionnaire. Moreover, the interviews provided valuable insight for the development of the benchmarking criteria of the study.

The following interviews were conducted in connection with stakeholder survey:

- Interview with Mr Aaron Curtis, representing the European Transport Workers Federation (ETF), 23 September 2016;
- Interview with Mr Peter Curran and Ms Katharina Ernst, representing the International Air Transport Association (IATA), 28 September 2016;
- Interview with Mr Vincent de Vroey, Mr Luc Lallouette and Mr Yoann Viaouet, representing the Aerospace and Defence Industries Association of Europe (ASD), 28 September 2016;
- Interview with Mr Tom Laursen, representing the International Federation of Air Traffic Controllers' Association (IFATCA), 6 October 2016;
- Interview with Mr Jean-Denis Larrere, representing the Air Traffic Controllers European Unions Coordination organisation (ATCEUC), 7 October 2016;
- Interview with Mr Giancarlo Saviantoni, representing the Air Traffic Controllers European Unions Coordination organisation (ATCEUC), 7 October 2016;
- Interview with Ms Stefanie Erdman, representing the Airlines for Europe – A4E, Mr Choorah Singh, representing Ryanair, and Mr Andy Braid, representing Jet2.com, 7 October 2016.

The outcome of these complementary stakeholder interviews is outlined in section 3.2.5.

3.2 Analysis

3.2.1 FAB policy

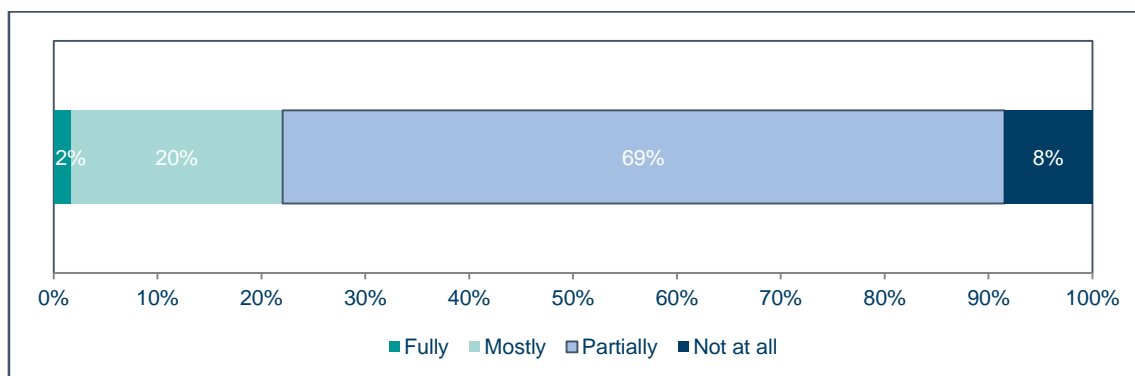
3.2.1.1 General

The FABs system is a centrepiece of the Single European Sky (SES) policy, which has as one of its objectives the reduction of fragmentation across national borders in European Air Traffic Management (ATM). Respondents were requested to indicate to which extent the creation of FABs addressed the objectives of the SES initiative. The overall impression is only marginally positive, with just under a quarter of respondents (22%) indicating that the FABs have fully or mostly addressed the objectives of the SES initiatives, while more than two-thirds (69%) believe that FABs have only partially addressed SES objectives.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

The survey results did not show a significant difference between the groups of stakeholders in their views on this question, with the largest number of each stakeholder type responding '*Partially*'. Figure 31 shows the distribution of responses. Comments accompanying these responses are summarised below.

Figure 31 Has the creation of FABs addressed the objectives of the SES initiative? (N=59)



The prevalent view is that the FABs have only partially addressed the objectives of the SES initiative. ANSPs account for 41% of these respondents, and NSAs a further 24%. While FABs have generated some regional initiatives that have contributed to the achievement of SES objectives, the FABs have generally been established on the basis of national boundaries and political considerations, rather than on the basis of operational requirements. It is argued that a more operational approach is required in order to enable a true network optimisation (i.e. arranging traffic flows regardless of national boundaries) and achieve the projected operational benefits. This view is echoed across all stakeholder groups. At the same time, however, airspace optimisation is the area that is most cited by respondents to illustrate progressive FAB initiatives.

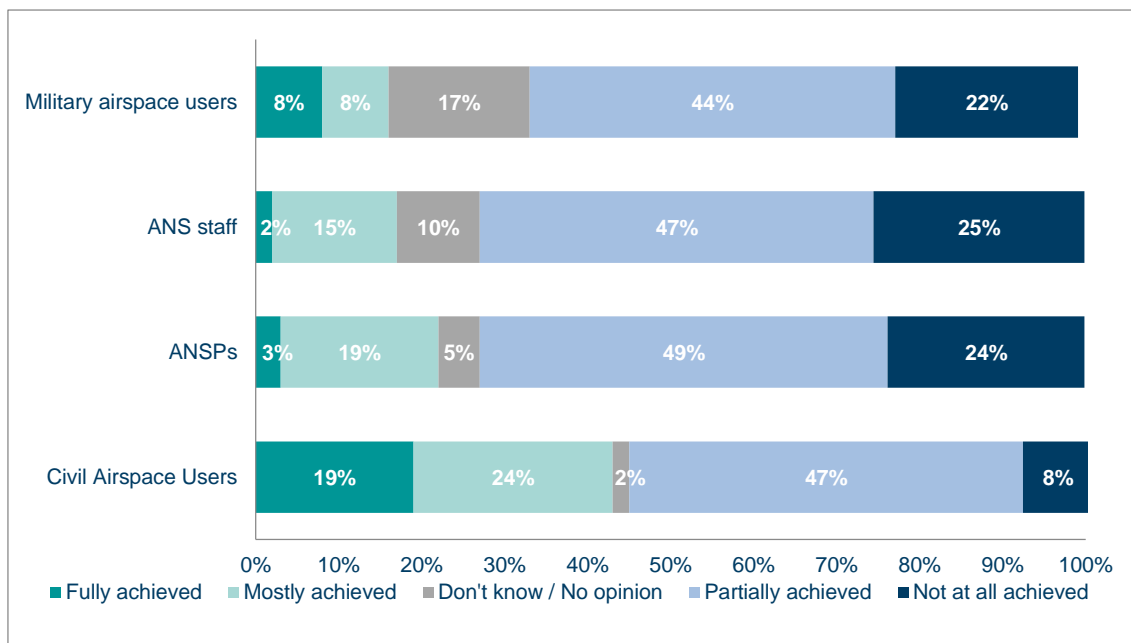
In areas that do not necessarily require a geographical proximity, such as ATM system development, "where complexity and differing stages of lifecycle are said to play a big part to play in upgrades," joint FAB initiatives are considered even more difficult to pursue. According to ANSP, Ministry and NSA respondents, common functionalities within neighbouring systems are a prerequisite for many of the planned initiatives, however changing a system mid-lifecycle would entail extremely high costs that would also impact on users. Moreover, to the extent that progress has been made on collaboration on technology, it was argued by a trade union representing workers that achievements could have been higher under a non-FAB approach, for instance, based on creating common technology around Europe.

One Ministry stakeholder noted that, despite positive intentions, the lack of common goals and a shared responsibility within FABs has led to only very limited results.

Respondents were then asked whether the establishment of FABs has addressed the respective **needs of relevant ATM stakeholders**, distinguishing between Military Airspace Users, ANS Staff, ANSPs and Civil Airspace Users. The results are presented in Figure 32 below.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Figure 32 Has the creation of FABs addressed the needs of the following stakeholders? (N=59)



Across the board, the majority of respondents indicated that stakeholders’ needs are, at best, partially addressed (i.e. ‘partially addressed’ or ‘not at all addressed’). Respondents offer the most positive assessment for Civil Airspace users, with 43% indicating that the needs of this stakeholder group have been ‘Fully achieved’ or ‘Mostly achieved’ since the establishment of FABs. The other stakeholder groups do not vary significantly from one another, with between 16% to 22% believing their respective needs to be addressed by the FABs.

Comments accompanying these responses are summarised per stakeholder group below.

Civil Airspace Users

According to one ANSP, where operational focus has been achieved, civil airspace users have experienced improvements concerning cross-border operations. NSA, Ministry and ANSP respondents from one FAB pointed to initiatives such as airspace movements and the implementation of FRA as having delivered measurable benefits to airspace users, which have reduced the distance flown, therefore reducing costs and lowering emissions.

A representative body for airspace users drew attention to the gap between goals and implementation, stating the following: “Conceptually, FABs could have significantly addressed the need of airspace users to achieve the high-level SES goals. Due to the lack of meaningful FAB implementation, however, FABs have not addressed these needs and goals.”

ANSPs

Respondents indicating that FABs have mostly addressed the needs of ANSPs hail mainly from within one single FAB (ANSP, NSA, Military). Based on their experience, FABs have brought significant improvements and benefits, particularly in term of strengthened

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

cooperation with other internal stakeholders (MoTs, MoDs and NSAs), with their neighbouring FAB partners and at Inter-FAB level. The FAB has also experienced benefits in terms of an improved standing with the European Commission and related institutions, such as INEA.

The prevalent view among respondents indicating that FABs have only partially addressed the needs of ANSPs is that, while FABs can be credited – to varying degrees – with facilitating collaboration and cooperative arrangements, most FAB projects have not directly benefited ANSPs. According to 3 respondents (2 ANSPs, 1 NSA), while a number of FAB projects have driven efficiency savings for the ANSPs (i.e. joint procurement, setting up a common entity, sharing expert resources), the majority are focused on delivering benefits to airspace users. Another respondent pointed to the opportunities created by FABs to exchange best practices, share activities and programmes and to perform common objectives through joint procurements, which have facilitated the achievement of targets. At the same time, however, the respondent notes that the rate of delivery did not meet the level of initial expectations. One NSA also commented that the FAB experience has contributed to a better understanding among the ANSPs of user needs.

Amongst those indicating that the needs have not been addressed (needs '*not at all addressed*'), two main issues are raised. Respondents assert that FABs represent an additional overhead to ANSPs without delivering additional benefits beyond those that could be achieved through less costly engagement mechanisms for example bilateral collaboration or industry partnerships. Another respondent points to the additional layer of workload for ANSP management to deal with FABs but with fewer staff. The second issue raised by respondents is that the FABs have been forced to cooperate on the basis of political decisions, effectively preventing ANSPs from acting in their own best interests.

ANS Staff

When elaborating on the needs of ANS staff, respondents generally refer to the provision of consultation mechanisms for enhancing social dialogue among ANS staff. For several respondents, FABs have led to greater cooperation between the staff by regularising information exchange and sharing best practices, which in turn facilitates knowledge transfer that benefits ANS staff. One ANSP and one military authority from the same FAB referred to their FAB Social Consultation Forum, which is a permanent body tasked with the implementation of social cooperation within the framework of the FAB.

According to 3 respondents from one FAB (2 ANSPs, 1 Military authority), the FAB project, through the abovementioned activities, has helped to make the ANS staff more internationally focused and open to cooperation. However, maintaining the complex governance and consultation structures between the states within the FAB requires that the FAB continues to progress, which in turn requires substantial amounts of effort on the part of ANS staff. The effort involved with identifying and discussing joint projects comes on top of an already heavy workload within ANSPs without delivering any additional benefits for the ANS staff (i.e. benefits are primarily targeted to the airspace users).

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Other comments, all from different representative trade bodies, were:

- There has been no social dialogue between ATCOs, as well as insignificant meetings between management units
- The engagement of ANS staff in FABs is inconsistent, with some strong examples in certain FABs, and wholly absent in others
- FABs have created more insecurity
- Most measures have had a negative impact on staff, resulting over time in bad equipment and reduced quality of training

Military Airspace Users

Despite only 16% of respondents indicating that the needs of military airspace users are addressed by FABs, the comments generally referred to some of the positive achievements. One NSA respondent noted that, as a minimum, military operations have not been restricted due to FAB activity. Several respondents (ANSP, further commented that where operational focus has been achieved, military airspace users have experienced improvements with respect to cross-border military operations concerning between the participating states. Air policing was mentioned by one Military authority stakeholder as a particular area where improvements have materialised.

Two ANSPs and one NSA reported two specific initiatives that have benefited military airspace users: (1) the coordinated implementation of ASM/ATFCM processes (through a common project focusing on functional integration of ASM/ATFCM Processes) and (2) the creation of a Joint Civil-Military Airspace Coordination Committee, through which strategic coordination of the national ASM and Airspace Design policies and ATFCM processes and civil-military cooperation were done.

A smaller number of elaborations were made on the failure of FABs to address military airspace users' needs, referring only generally to the lack of cooperation achieved, with military airspace users tending to maintain a more national approach.

General comments:

Some general comments were:

- Only very limited effects can be observed from the creation of FABs, which are mostly linked to the somewhat forced coordination of performance plans at FAB-level.
- Due to the adoption of an insufficient operational approach when preparing the FABs, the full needs of the various categories of stakeholders have not, and could not be fully addressed. Significant differences are observed in the approach followed by FABs to meet the various stakeholders' respective needs.
- According to one ANSP, the most important stakeholder is the State, which is not mentioned in our survey. "The establishment of FABs has been the political decision of States and the EC. Therefore their expectation of defragmenting the European airspace has mostly been fulfilled."

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

3.2.1.2 Objectives and goals

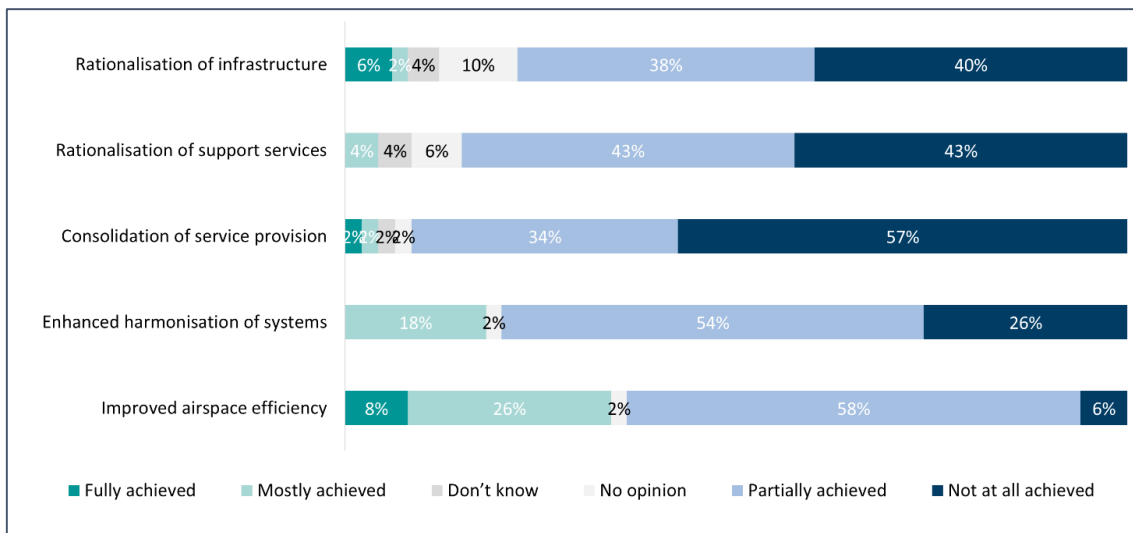
A main operational objective of FABs is to improve ANS performance and create synergies, through enhanced cooperation between Member States. At their core, FABs are expected to contribute to the realisation of the SES objectives in the form of:

- Improve airspace efficiency, due to reduced airspace fragmentation leading to improved flight efficiency.
- Harmonisation/interoperability, through the regional harmonisation of systems and procedures through the adoption of standard or at least inter-operable systems.
- Consolidation of service provision with new operational concepts resulting in reduced costs of fragmentation at ACC level.
- Rationalisation of support services contributing to reduced support costs such as AIS and MET
- Rationalisation of infrastructure through the retirement of superfluous equipment, reducing technical support costs.

Respondents were asked a number of questions in relation to these aspects:

In your view, to which extent have these objectives already been achieved?

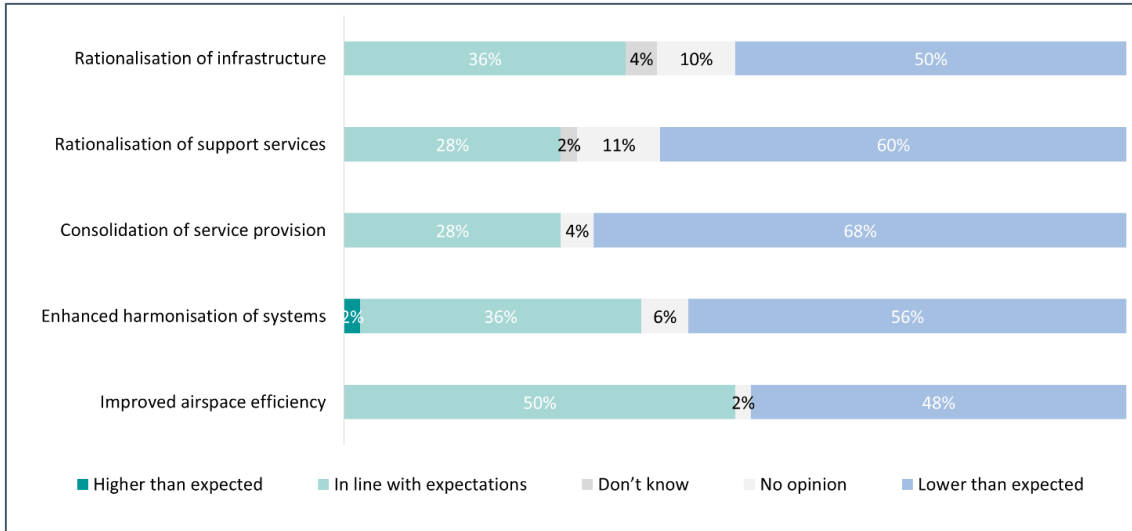
Respondents generally thought that objectives have not been achieved apart from airspace efficiency:



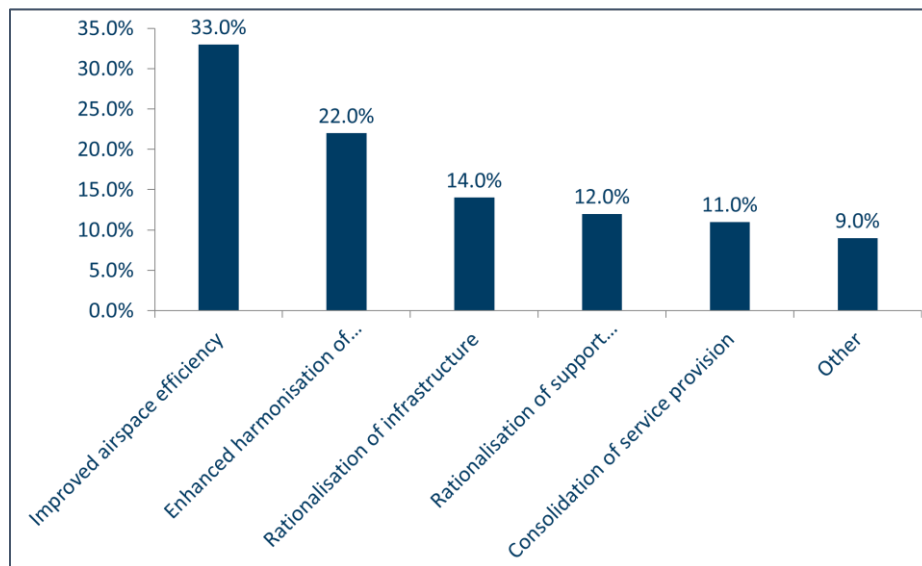
**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

From your experience, were achievements of FABs in meeting these objectives higher or lower than expected?

Most respondents thought that objectives on the whole were not achieved, apart from in improving airspace efficiency:



Respondents were also asked, "For which objective have FABs seen most progress? Please rank these from 1 (most) to 5 (least)." The results below are given as a weighted average from all the answers, from 49 respondents:



There were different perspectives on the objectives that have seen the most progress from different stakeholder groups as follows:

- 39% of **ANSP** responses ranked improved airspace efficiency as the top achievement, followed by enhanced system harmonisation (18%) and consolidation of service provision (16%). The introduction of Free Route Airspace was cited as a good achievement. It was also commented that the majority of harmonisation actions was through IOP regulations, not FABs, and that systems cooperation (such as iTEC, COOPANS) whilst successful between some

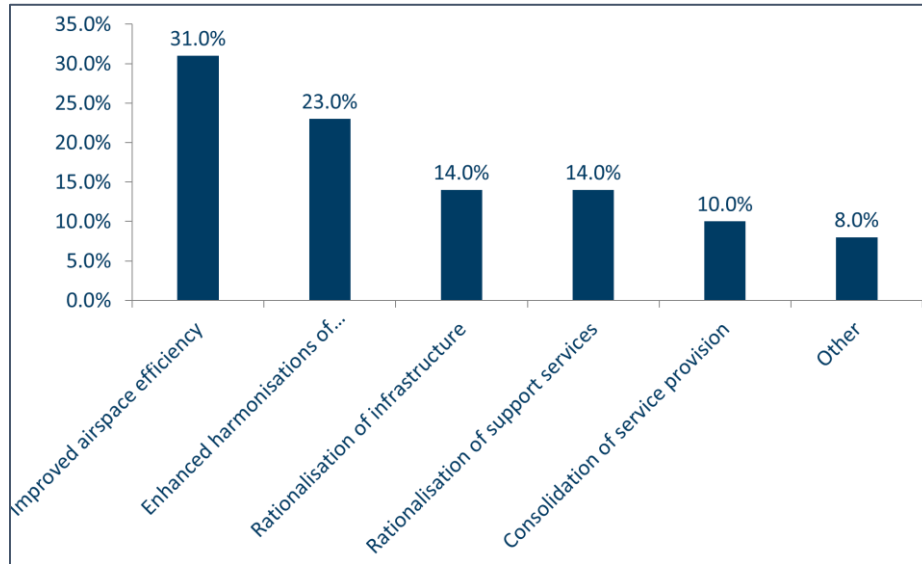
Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

organisations is limited within FABs by the different ownership models. It was commented that rationalisation of support required a clear business case.

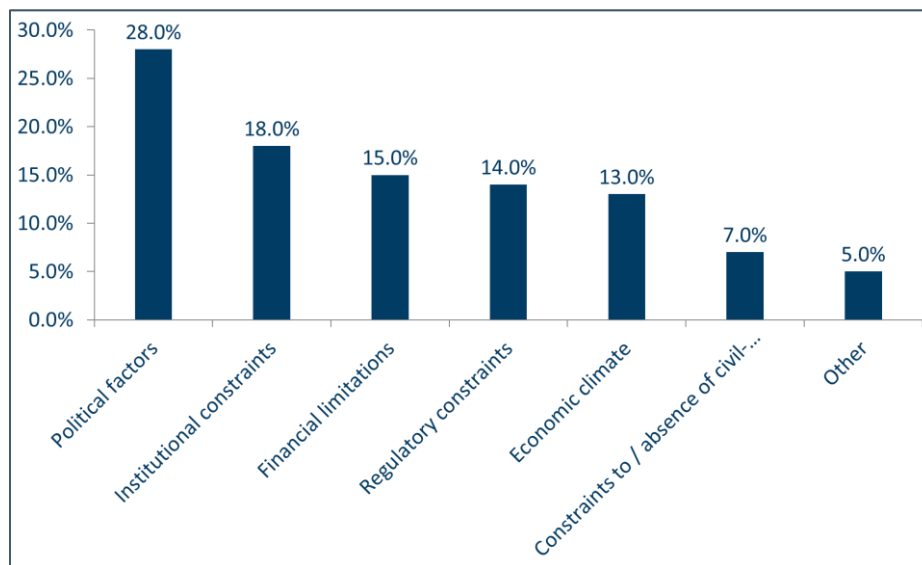
- **Trade Unions** ranked improved airspace efficiency as the top achievement (27%), followed by enhanced system harmonisation (24%) and 'other' (15%). They commented that FABs have increased fragmentation as they have created additional companies, e.g. training providers, and management positions.
- **EU level actors** also ranked improved airspace efficiency as the top achievement (37%), followed by enhanced system harmonisation (31%) and rationalisation of support services (18%). However, they commented that there were only a few examples of improved airspace efficiency or system harmonisation from FAB activities. They also see no examples of consolidation of service provision or infrastructure.
- **Airspace users** selected 'other' (100%) but did not elaborate.
- The **military authorities** ranked rationalisation of support services highest (28%) followed by rationalisation of infrastructure (19%) and improved airspace efficiency (19%). A comment was made on the achievements of DANUBE FAB projects in airspace, systems harmonisation and rationalisation of infrastructure, as well as important achievements in inter-FAB cooperation, FAB enlargement and joint involvement in European Initiatives.
- **Ministries** of transport ranked improved airspace efficiency as the top achievement (37%), followed by enhanced system harmonisation (28%) and rationalisation of infrastructure (18%).
- **NSAs** gave the same view as Ministries, ranking first improved airspace efficiency (30%), followed by enhanced system harmonisation (26%) and rationalisation of infrastructure (13%). It was commented that States should not be involved in such large technical projects but this should be for ANSPs. There was also a concern that there is a lack of clarity in FAB objectives and legislation.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The survey further asked, "For which objective do you expect the FABs will eventually have the most impact in the future? Please rate these from 1 (most) to 5 (least)." Results are given as weighted average from all answers contributed by 48 respondents:



Respondents were asked: "Where expectations have not been met, which factors have hindered the achievement of the objectives? Factors mostly outside of FAB control were ranked in order of importance – 1 being the most important factor. The results are given as weighted average from all answers contributed by 49 respondents:



Comments to the above responses per stakeholder group were as follows:

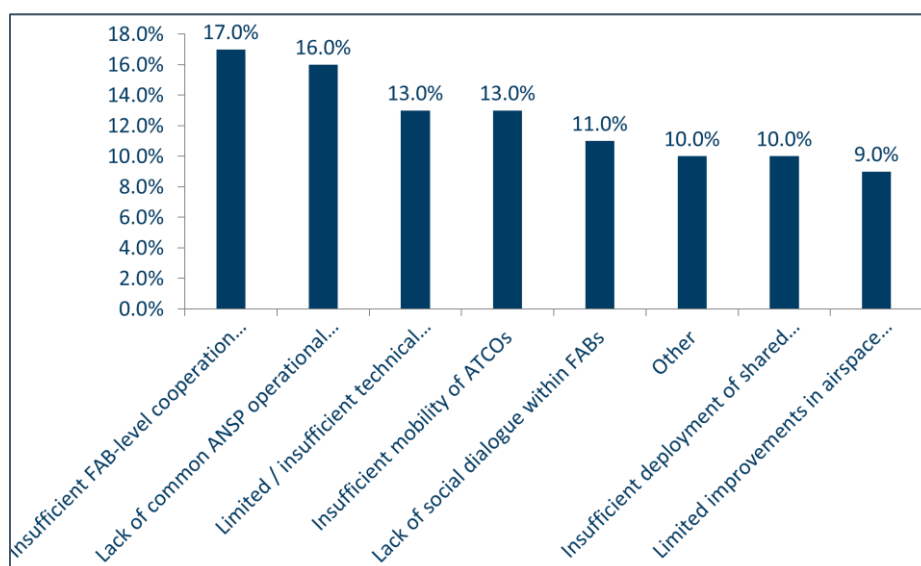
- ANSPs ranked the most important factor as political (27%) followed by institutional constraints (20%) and regulatory constraints (17%). Regulatory constraints were elucidated as concerning the difference between regulations in different States such as procurement, recruitment and external relations. Also political and cultural differences between States were seen as a barrier, albeit one that could be overcome by good relationships being developed. Some

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

respondents also cited financial problems, but more due to the pressure on investment from the performance scheme.

- Trade unions also ranked political factors as the top issue (28%) followed by constraints to civil-military cooperation (20%), with institutional constraints (15%) and financial constraints a joint third (15%). They commented that expectations on FABs are not realistic.
- EU actors ranked: political factors (36%), regulatory constraints (20%) and institutional constraints (18%). They cited problems with insufficient political support and a complicated regulatory framework. They also felt it contradictory to require consolidation of service provision whilst trade regulations encourage competition.
- Airspace users ranked: political factors (35%), institutional constraints (26%) and regulatory constraints (18%).
- Military authorities ranked political factors as the top issue (41%) followed by 'other' (21%) and constraints to civil-military cooperation (15%). However, there was also a comment that 'we have not identified expectations which have not been met'.
- Ministries ranked: financial limitations (24%), political factors (23%) and regulatory constraints (22%). Financial limitations are top due to investments being expected from the public sector.
- NSAs ranked: political factors (24%), institutional constraints (20%) and financial limitations (16%). It was commented that NSAs were limited by national law with huge differences in finances.

Respondents were further asked: "Where expectations have not been met, which factors have hindered the achievement of the objectives? ii) Factors mostly inside FAB control (please rank in order of importance – 1 being the most important factor)". The results are given as weighted average from all answers contributed by 47 respondents:



**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Comments to the above responses per stakeholder group were as follows:

- ANSPs ranked the most important factor as insufficient FAB-level cooperation at State-level (19%), followed by insufficient mobility of ATCOs (17%) and insufficient deployment of shared staff (13%), a factor judged jointly with lack of common ANSP operational arrangements at FAB level. ANSPs recognise the common functions that each provides within the FAB, but cited difficulties in gaining common agreement. FAB governance does not appear to help in this respect, one FAB commented that it is dominated by State figureheads with too much of a high-level view. It was also commented that technical convergence is very difficult as ANSPs do not have common systems, hence the success of partnerships such as iTEC and COOPANS. BLUE MED commented that greater ATCO mobility would 'solve a lot of FAB issues allowing a better performance at FAB level'. The geographical scope of the FAB was also commented as an issue hindering more effective use of resources. It was also commented that the reluctance to pool revenues was a hindrance.
- EU actors ranked first the lack of common ANSP operational arrangements (26%), followed by insufficient FAB-level cooperation at State-level (24%) and insufficient mobility of ATCOs (16%). It was commented that there are too many parties involved in decision making which leads to an inability to agree on how to share resources, costs and revenues.
- Trade unions also ranked the most important factor as insufficient FAB-level cooperation at State-level (24%), followed by lack of social dialogue (23%) and lack of common ANSP operational arrangements (15%). However, they argue that the dominant factor is the desire of airlines to pay the lowest price for the service, which is outside of the FAB's control.
- Airspace users ranked: lack of common ANSP operational arrangements at FAB level (37%), then insufficient FAB-level cooperation at State-level (28%) and insufficient mobility of ATCOs (21%).
- Military authorities ranked lack of social dialogue (27%) followed by limited/insufficient technical convergence within FABs (19%) and 'other' (19%).
- Ministries ranked: limited/insufficient technical convergence (29%), insufficient FAB-level cooperation at State-level (16%) and lack of social dialogue (15%). It was commented that there are difficulties in technical convergence given the different lifecycles and types of participant ANSPs' systems.

NSAs ranked: 'other' (24%), lack of common ANSP operational arrangements (19%) and limited/insufficient technical convergence (13%).

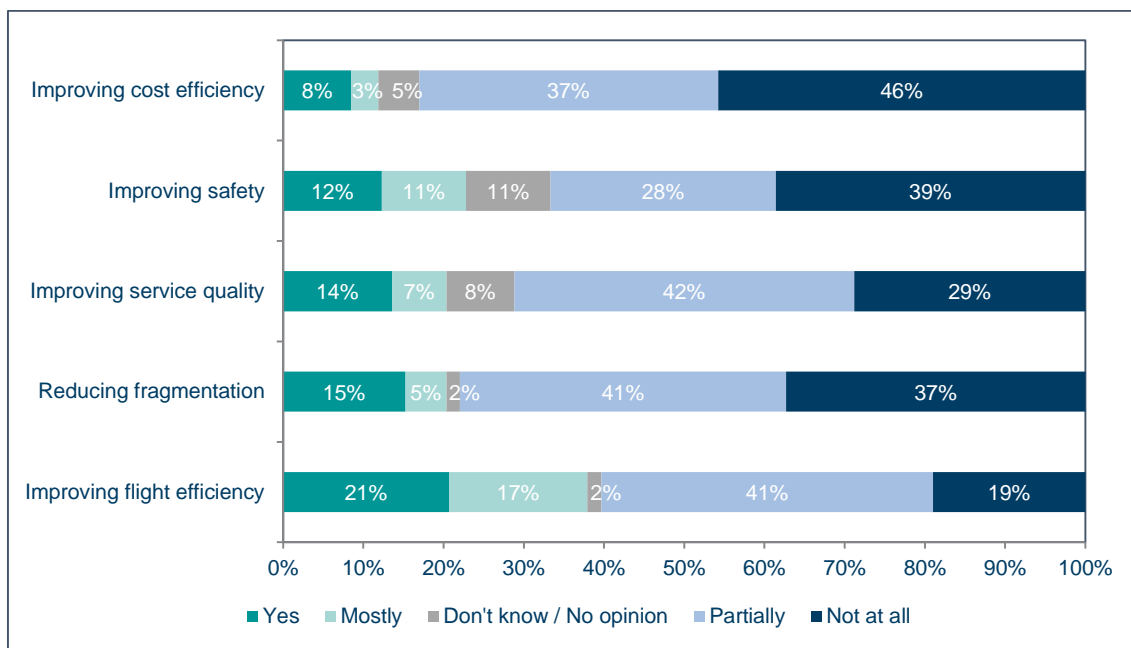
3.2.1.3 Impacts and progress

Respondents were asked to indicate whether the creation of FABs has been effective in terms of a number of key impact areas, namely improving flight efficiency, reducing fragmentation, improving service quality, improving safety and improving cost efficiency. Overall, impacts have been highest in the area of improving flight efficiency, with 38%

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

of respondents indicating that FABs have been a very or mostly effective vehicle for delivering improvements in this area, with less than 24% offering a positive assessment for each of the other 4 impact areas. Figure 33 shows the distribution of responses. Comments accompanying these responses are summarised per impact area below.

Figure 33 Has the creation of FABs been effective in terms of the following impacts? (N=57-59)



Improving cost efficiency

The general view is that FABs have not impacted cost efficiency positively and/or directly. As summarised by 1 NSA, the simultaneous delivery of benefits stemming from operational improvements and improved cost efficiency is considered possible only in the longer term:

"[Our FAB] has improved flight efficiency for airspace users, continuing to provide a quality service and maintain levels of safety, despite increased traffic growth. However, the FAB requires a large investment of effort which may have actually added to the cost base overall. Significant improvements in cost efficiency and reductions in fragmentation would require more significant consolidation of service provision functions which would require introduction of common ATM systems or functionalities. This is only possible in longer term as ANSPs are often in differing stages of lifecycle and changing the systems in the middle of lifecycle would negatively impact on cost-efficiency."

It was, however, observed that some improvements in coordination and more consistent cooperation between ANSPs have enabled them to design and implement cost efficiency measures as appropriate. One ANSP respondent referred to cost reductions with common procurement and common trainings in a general sense. Another respondent on

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

behalf of a workers' union referred to the case of several ANSPs launching a common call for tenders to purchase radios.

It was also noted by one union representing workers at EU level that, while cost efficiencies have been realised, these are a result of the performance scheme and not a direct consequence of FABs themselves.

Improving safety

The general view is that safety is not directly impacted by FABs and should be considered as a local issue, and that achievements are not related to FAB activities. One trade union representative, however, suggested that the improvements to efficiency achieved to date – albeit limited – have also created increased complexity, which can have negative consequences for safety in the future. Another respondent, on behalf of a national ATCO representative body, noted that safety is already very high, making it difficult to foresee how it can be improved

Improving service quality

The general view is that delays cannot be addressed at FAB level for a number of competing reasons. One holds that delays are generated at local level and, while help and advice may be sought within the FAB, any reduction depends on local staffing and systems. The other view is that delays do not depend on ANSPs but rather on external causes (e.g. Cyprus, or the unexpected increase in air traffic). It is also questioned whether FABs can be credited with observed reductions. Finally, one ANSP clarified that there have been no improvements in delays from the FAB because there were no delays in the first place.

Where improvements have been obtained, examples were:

- The use of airspace user input to steer the design for introducing airspace design and direct routing (NSA);
- New common solutions with collaborative decisions between ANSPs of the FAB (Trade union)

Reducing fragmentation

There is general agreement among the respondents that fragmentation of airspace has not been significantly reduced. To the extent that airspace has been defragmented, respondents further assert that it is not due to the FAB or that it has not been done according to the basic principle for FABs, i.e. functionality principle. Concerns were raised that FABs have not led to any changes in the state borders. One NSA stated that original state borders and the responsibility of each state remain unchanged and any improvements in this area are not caused by the creation of FABs. On the point of state borders, one trade union representative noted that, at the boundaries of the European states, one finds military bases. As a result, you always encounter military bases that cannot be removed.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Improving flight efficiency

The prevalent view is that FABs have had the most impact with respect to flight efficiency. Explanations pointed to direct routings between some adjacent ANSPs and airspace design measures implemented under the FABs. On the other hand, several respondents from trade unions and ANSPs questioned whether progress would have been achieved in the absence of the FABs as well. Still another respondent from an ANSP asserted that despite improved flight efficiency possibilities that have been created for airspace users, users have not fully utilised the opportunities.

General comments:

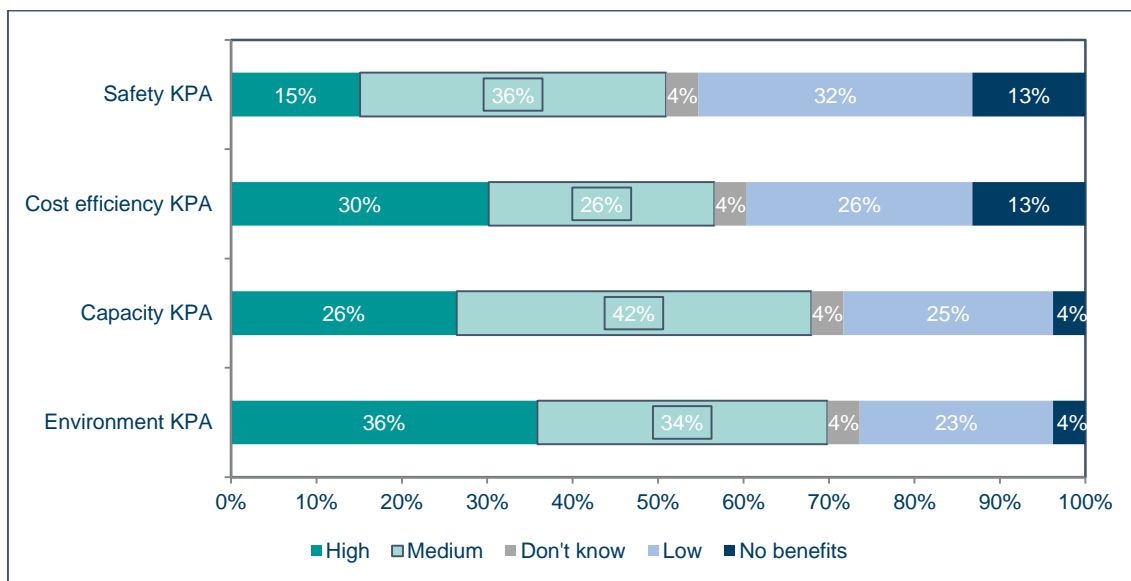
The following general comments were made in reference to FAB impacts:

- The FABs generally did not bring any additional solutions to those that the Network Manager was already building with the ANSPs considered individually.
- The number and complexity of administrative processes needed for each FAB have resulted in significant additional costs that are difficult to offset owing to the small financial impact of the benefits achieved.
- FABs never became functional in terms of delivering improvements and we do not see clear efficiencies that can be derived from FABs.
- The performance plans presented by each of the FABs did not provide for optimal use of airspace or benefits from enhanced financial, human resource or technical collaboration. The plans have rather been an aggregation of national initiatives and measures.

Respondents were then asked to indicate whether FABs have the potential to contribute to the SES KPAs. Overall, stakeholders are most optimistic regarding the potential for FABs to contribute to the Environment and Capacity KPAs, with 70% and 68% of respondents, respectively, indicating 'medium' or 'high' impact potential. A small majority of respondents also foresee a positive impact to the Cost efficiency and Safety KPAs (56% and 51% of respondents, respectively), while 13% of respondents expect no impact to either cost efficiency or safety. Only 15% of respondents project a high impact to safety from the FABs, compared to 30% for cost efficiency. Figure 34 shows the distribution of responses per KPA.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

Figure 34 In the future, to what extent can FABs contribute to the following SES KPAs? (N=53)



According to one EU-level respondent, KPAs could be better addressed at FAB level by using the best practices of the best performer within each FAB, and subsequently, through the Inter-FAB coordination mechanism, of the absolute best performer at EU level. Another EU respondent commented that even a fundamental revision of the FABs would be insufficient to increase their contribution to the SES KPAs, proposing instead that a comprehensive network approach be adopted. Two respondents on behalf of workers’ trade unions suggested social dialogue in regards to other potential KPAs that can be addressed by the FABs.

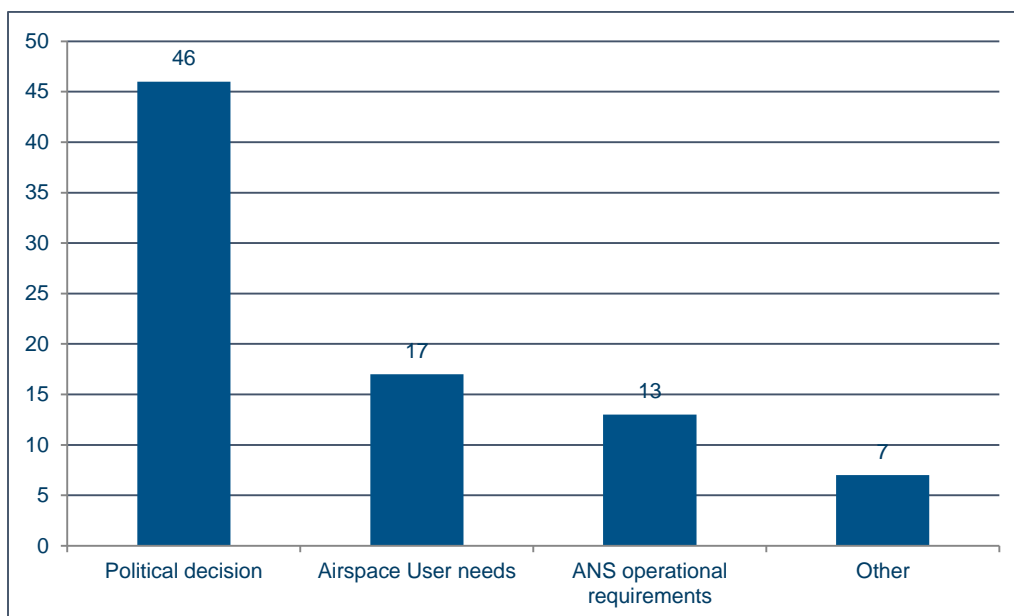
3.2.1.4 Rationale for establishing FABs

Respondents were requested to reflect on the rationale underpinning the geographical scope and organisational set-ups of the FABs (i.e. “When creating the FABs, the decision for setting up the geographical scope / organisation of the current nine FABs was based on which criteria?”) at the time they were created. Respondents were allowed to indicate a maximum of 2 decision-criteria, distinguishing between ‘Political decision’, ‘ANS Operational requirements’, ‘Airspace user needs’ and ‘Other’.

According to respondents, political considerations were the single most important factors influencing the eventual organisation and geographical scope of FABs (i.e. ‘the geographical scope and organisation of the FAB was based on political decisions’), indicated by 89% of respondents. The next most frequently cited decision criteria is ‘Airspace user needs’, indicated by approximately one-third of respondents (33%). The distribution of responses is shown in Figure 35.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

Figure 35 When creating FABs, the decision for setting up the geographical scope / organisation of the current 9 FABs was based on (N=52):



There is general agreement among respondents that FABs have been established, first and foremost, on the basis of political interests and geographic convenience (i.e. adjacent states), 'with traditional allies' (i.e. based on historical cooperation practices on regional levels). Respondents further assert that limited consideration was given to the nature of airspace user / customer needs or ANS operational requirements.

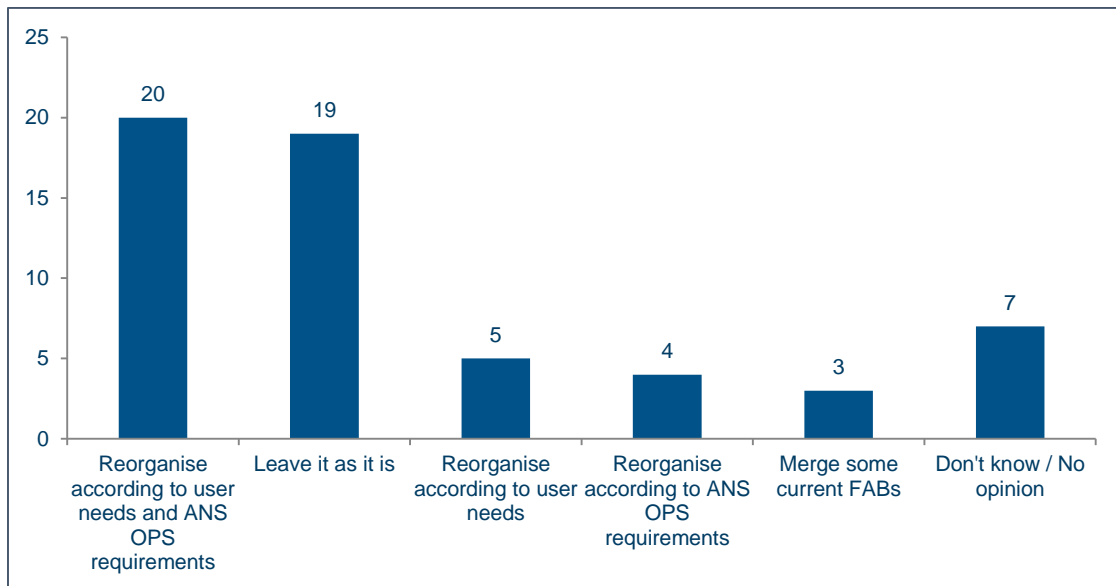
Related to the above question, respondents were asked to reflect on whether it would be appropriate to adjust the geographical scope, and if yes, the most appropriate way to do it, given the following options:

- Merge some current FABs
- Reorganise the FABs according to the user needs
- Reorganise the FABs according to the ANS Operational requirements
- Reorganise the FABs according to the user needs and ANS Operational requirements
- Leave the FABs as they are

The distribution of responses is shown in Figure 36, followed by comments accompanying these responses.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

Figure 36 If there is a need for adjusting the geographical scope of FABs, do you find it appropriate to (N=51):



Overall, the preferred option is 'Reorganise according to user needs and ANS Operational requirements', indicated by just under two-fifths of respondents (39%), however nearly the same number prefer to leave the geographic scope of FABs unchanged (i.e. 'Leave it as it is'), indicated by 37% of respondents. ANSPs overwhelmingly favour leaving the FABs unchanged, accounting for just under 70% of the responses; NSAs tended to favour the option to 'reorganise according to both user needs and operational requirements', indicated by 50% of all NSA respondents. Airspace users and trade bodies were split between 'reorganise according to both user needs and operational requirements', 'reorganise according to user needs' and 'merge some current FABs'.

When asked to elaborate, respondents having indicated 'Leave it as it is' expressed concern that, given the amount of resources already invested into the creation of FABs as they are today, reorganising the FABs, in particular enlarging FABs, would create additional costs and administrative burdens for the ANSPs while negatively impacting decision-making flexibility. According to 4 respondents, including ANSPs, Ministry and NSA stakeholders, benefits from the FABs are beginning to materialise in some areas, for example airspace optimisation, CNS rationalisation, more efficient use of resources.

There was also a view, shared by several ANSPs, that any potential reorganisation should take place through normal business development. It was suggested that more focus should be given to building business opportunities between ANSPs rather than to the FABs. One ANSP offered the example of Borealis cooperation, which involves the cooperation of 3 FABs, to illustrate that the FAB is not the only possible form to enable or foster cooperation.

Further comments were:

- Benefits would certainly be increased with more extensive inter-FAB coordination and cooperation.
- Promote industrial partnerships rather than geographical neighbourhood

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- More focus on improved customer performance.

Among those who indicated that the FABs should be reorganised according to both user needs and ANS operational requirements, suggestions for improvement were:

- Integrate ANSPs into one International Organisation with a clear mandate concerning distribution and allocation by the founding States. Once institutional issues and rules are solved, the airspaces can be reorganised according to users’ needs while also taking into account pure operational requirements aimed at maximising capacity and performance.
- FABs should be reorganised in a border-free / borderless network approach, ensuring that resources invested in the current set-up can be re-used as much as possible.

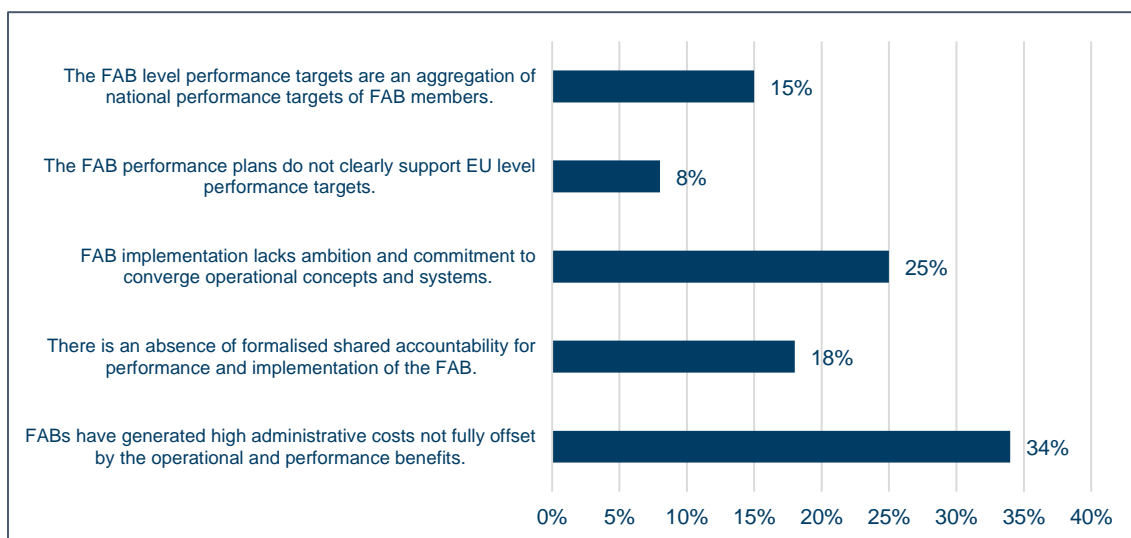
One ANSP drew attention to the inability of some FABs to deliver true economies of scale as a result of the smaller size, while other FABs are too large, leading to political infighting and an inability to reach agreements, particularly where changes undermine local jobs or affect income streams. This respondent suggested that it may be appropriate to enable a State to be a Member of more than one FAB.

3.2.1.5 FAB policy challenges

The survey comprised a set of questions concerning general challenges relating to the FAB implementation. The following three figures describe the results concerning the aforementioned questions.

The first question related to the FAB establishment and ambition. Respondents were first asked whether they agree with the proposed statements (reflecting possible FAB weaknesses/challenges) and then requested to rank the statements presented in Figure 37 below.

Figure 37 FAB establishment and ambition – weighted ranking of responses



**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The statement that “FABs have generated high administrative costs that did not fully offset the operational and performance benefits” was considered the most significant challenge related to the FAB, followed by the statement that “FAB implementation lacks ambition and commitment to converge operational concepts and systems”. The third most significant statement was “there is an absence of shared accountability for performance and implementation on FAB level”.

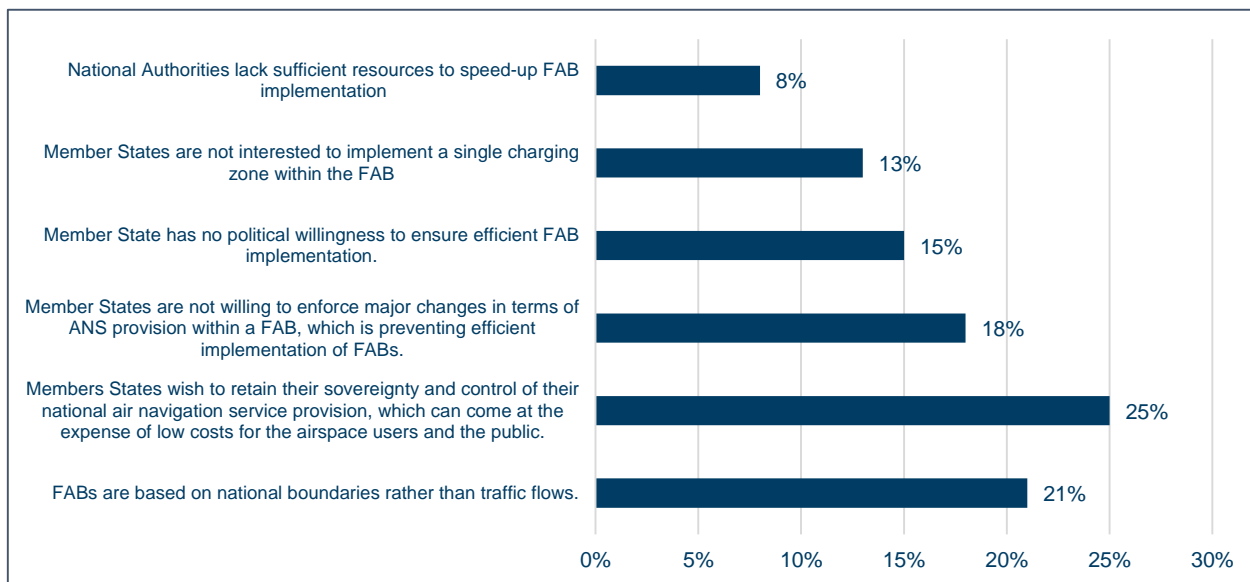
To complement the abovementioned figure and results, we are presenting below some additional comments on this topic provided by the various stakeholders:

- **ANSPs’** comments are illustrated by the following quote: *There is extensive coordination needed between all FAB partners to achieve wide reaching partnerships. Business needs have to be aligned as a pre-requisite to FAB Initiatives, as there is rarely business overlap in business needs across all FAB states. Adherence to the already defined framework of profitable ANSP model for each state means that there is little ambition to fundamentally change. There are no incentives and/or supporting measures to enhance cooperation between ANSPs. At the heart of the weaknesses of the FAB concept is the lack of flexibility & proportionality. ANSPs would support a more performance and market based approach to drive change rather than politically constructed FABs.*
- **EU level actor** comment on this matter complements with a view that *each state considers its ANSP model as a profitable and successful one so there is little ambition to fundamentally change.*
- **NSAs’** comments go in the direction that *FABs are driven by a set of rules and procedures stemming from EU legislation. FABs would almost certainly not exist if the regulation did not require them. The cooperation has not grown naturally through aligned needs. FABs are long term and rigid partnerships, and seem weak as other opportunities are pursued – some of which are perhaps perceived as more effective and flexible alternatives, such as industrial partnerships which are focussed on specific shared vision developed through aligned business needs*
- **Trade Unions’** comments to this specific topic are that *the way forward for FABs is technical collaboration and training of personnel. By putting pressure on the ANSPs the result has been that they reduce costs by keeping their technology alive despite it need to be changed and that training has become a market where quality is reduced and thereby the failure rates increase.*
- **Other:** *Change is approached with caution. ATS is a safety critical industry where change is approached with caution, and over the 12 years since FAB regulation has existed, the drivers for a more fundamental reform through FABs (i.e. more consolidation of services between FAB partners) have not outweighed the barriers to change.*

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

The second question regarded FAB policy impediments, as presented in Figure 38, and respondents were asked whether they agree with the proposed statements (potential weaknesses in the FAB policy) and then to rank the proposed statements (with which they agreed).

Figure 38 FAB policy impediments – weighted ranking of responses



The alternative stating that "Members States wish to retain their sovereignty and control of their national air navigation service provision, which can come at the expense of low costs for the airspace users and the public" ranked first. The second highest ranking was obtained by the statement that "FABs are based on national boundaries rather than traffic flows". The third highest ranking statement was that "Member States are not willing to enforce major changes in terms of ANS provision within a FAB, which is preventing efficient implementation of FABs".

To complement the abovementioned figure and results, a selection of relevant comments on this topic are presented below:

- **Airspace Users or Representing Organisations:** "A Single Charging zone is not supported by the airspace users as it does not account for cost-relatedness in an environment with largely diverging cost-bases and it offers the potential for cross-subsidization and weakens cost-efficiency pressure".
- **ANSPs:** "It is important that the FAB initiatives do not undermine each ANSP's sovereign responsibility to manage its own airspace. It is not clear what kind of "major changes" are expected of FABs. Compliance with PR2 performance targets placed on the FABs represent a key basis for whether such changes are necessary. Political will is there to implement, as long as politically the projects are mutually beneficial to all States. For a single charging zone option ANSPs comment that it is very difficult to reimburse charging between states, particularly when traffic changes each year so dynamically. The element of national boundaries and traffic flows was not taken into consideration in the FABs establishment. FABs founded on operationally similar blocks of airspace and have not supported ANSPs freedom to innovate and deliver benefit through more appropriate mechanisms, such as industry partnerships. The introduction of a

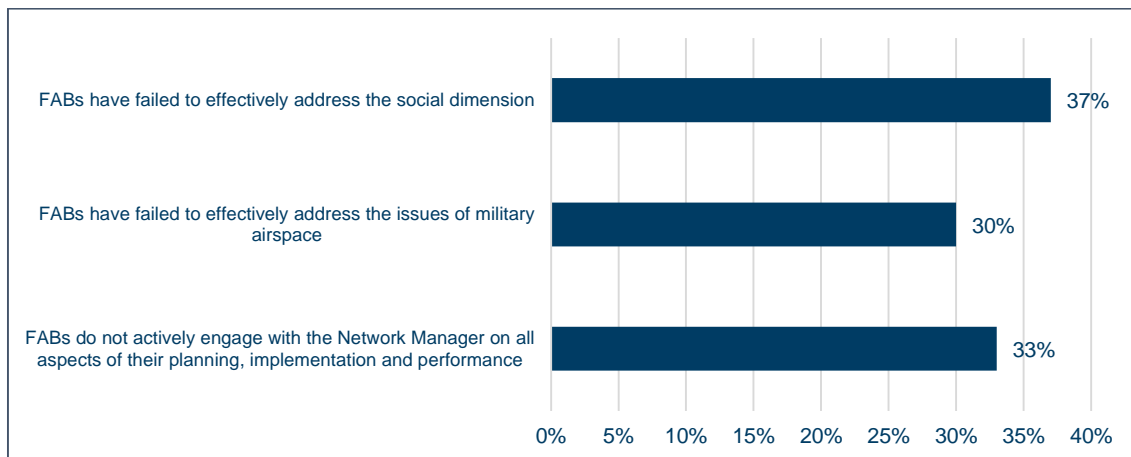
**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

single FAB unit rate would remove the benefits of transparency with charges, failing to be cost reflective of specific FAB member services".

- **Ministries:** *"There is limited willingness to put existing state owned ANS providers under pressure to deliver change".*
- **NSAs:** *"FABs should not be based on political/state initiatives, there has to be sufficient incentives at the operational level to drive the process naturally. No EU regulation concretely (only very generally) solve problem concerning financing of NSAs and increase huge differences between NSA and ANSP. The lack of clarity on EU policy and legislative detail in respect of objectives, strategy and outcomes from the FAB concept hinders clear policy implementation at FAB level".*
- **Trade Unions:** *"Every ANSP still looks after its interest and does not think in an FAB/team spirit".*
- **Other:** *"Policy aspect of FABs is the crucial issue to be resolved".*

The third question related to stakeholder engagement within FABs, as presented in Figure 39, and respondents were asked whether they agree with the proposed statements and then to rank the proposed statements (with which they agreed).

Figure 39 FAB stakeholder engagement – weighted ranking of responses



There is almost an equal distribution of results between the offered statements. Even though, the statement that FABs have failed to effectively address the social dimension is ranked first and can be understood as a major issue for internal processes within the FABs. The statement that FABs do not actively engage with the Network Manager on all aspects of their planning, implementation and performance is the ranked as a second option and this issue is seen as a high influencing factor on the overall performing of FABs.

To complement the abovementioned figure and results, here are presented the most significant comments presented on this topic by the various stakeholders:

- **ANSPs:** *"The social dimension element is a huge blocker, and is much more important than the other two aspects mentioned. FABs engagement with the NM is not an issue such as a social dimension and military airspace aspects. The nature of engagement with stakeholders varies across each FAB and in some it is very comprehensive in others it is less evident. Increasing NM involvement in*

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

FAB governance and planning would be appropriate as the NM is not accountable or responsible for the operation of FAB airspace".

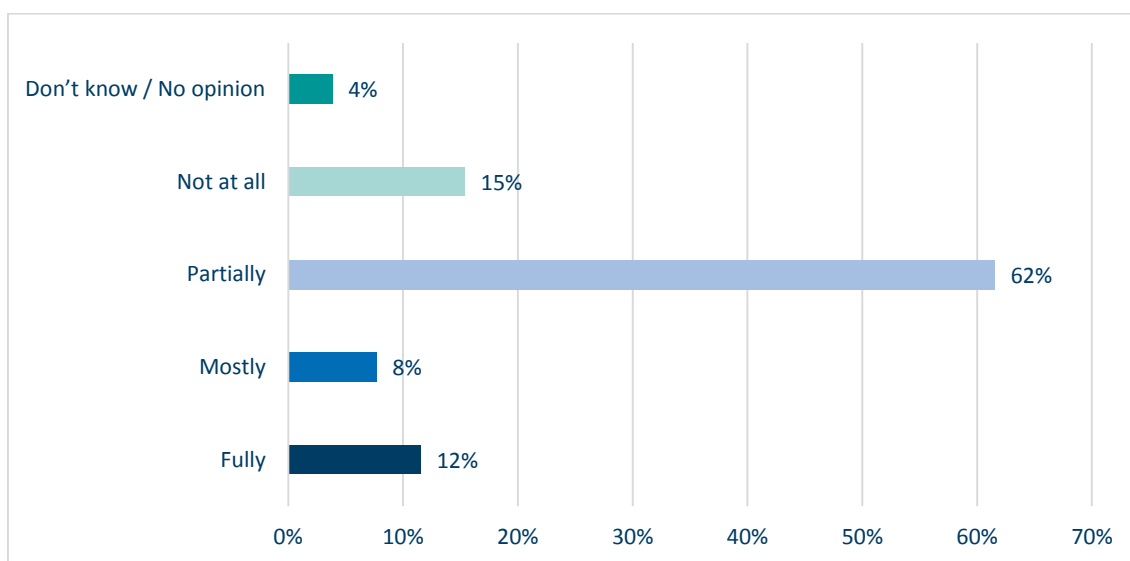
- **EU level Actor:** *"Decision-making process within FAB remains a major issue. Additional decision-making layers have been added without any added value to address in particular the two main failures listed above".*
- **Ministries:** *"The NM has the ability and competence to address effectively most network issues. However, again there is much resistance towards change which impacts negatively one or more ANSPs (i.e. also de facto States) within a FAB".*
- **Trade unions:** *"The basics were wrong for the FAB development. Reorganisation of airspaces (=flows=route charges) cannot be successfully achieved with collocation of entities which, to some extent, are in a competition - the 'Bottom-up' (ANSPs) States-EU did not work. Only an integrated International organisation managing all its resources across borders can fully develop what the SES is expecting. MUAC is a living example of what can/should be achieved to reorganise the flows without interference by the national interests (except defence) but in order to maximise the capacity available and redistribute the benefits to all. The ANSPs are doing their best to engage with the Network Manager and the system is actually working very well. Most of the staff at the bottom do not have a clue of what is discussed, or not, by the top brass. There is no social dimension. FABs have indeed in the majority of cases failed to address the social dimension. Some FABs have made some progress in flexible use of airspace concepts with their military partners which has resulted in some improvements".*

3.2.2 Regulatory and institutional dimension

3.2.2.1 Regulatory framework

As regards the consistency of FABs with the applicable regulatory framework, respondents were asked to present their view as to which extent the existing FABs have fulfilled the legal definition set out in the EU legislation (art. 2(25), EU Regulation 549/2004) ²⁴².

Figure 40 In your view, to what extent have the existing FABs fulfilled the definition set out in the EU legislation?



According to the survey results, most of the respondents (77%) did not consider the current FABs to be consistent with the definition set out in the SES legislation. More than half of all respondents (62%) regarded that FABs have only partially fulfilled the definition set out in the EU legislation, whilst 15% replied that FABs do not conform at all with the definition. Only 20% respondents were of the opinion that FABs have mostly or fully fulfilled the EU legal definition.

To complement the abovementioned figure and results, here are the most significant comments presented on this topic by the various stakeholders:

- ANSPs:** *"Only very few FABs have managed to put anything in place that resembles what was originally foreseen. For most FABs, the answer to this question is 'not at all'. There are many projects (both conducted and planned) which are based on operational requirements rather than state boundaries. However, ANS provision is still defined by national boundaries, through the national ANSP. Some FABs are not geographical optimal. The question of creating*

²⁴² According to the SES legislation (art. 2., Reg. 549/2004), a FAB is "based on operational requirements and established regardless of State boundaries, where the provision of air navigation services and related functions are performance-driven and optimised with a view to introducing, in each functional airspace block, enhanced cooperation among air navigation service providers or, where appropriate, an integrated provider".

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

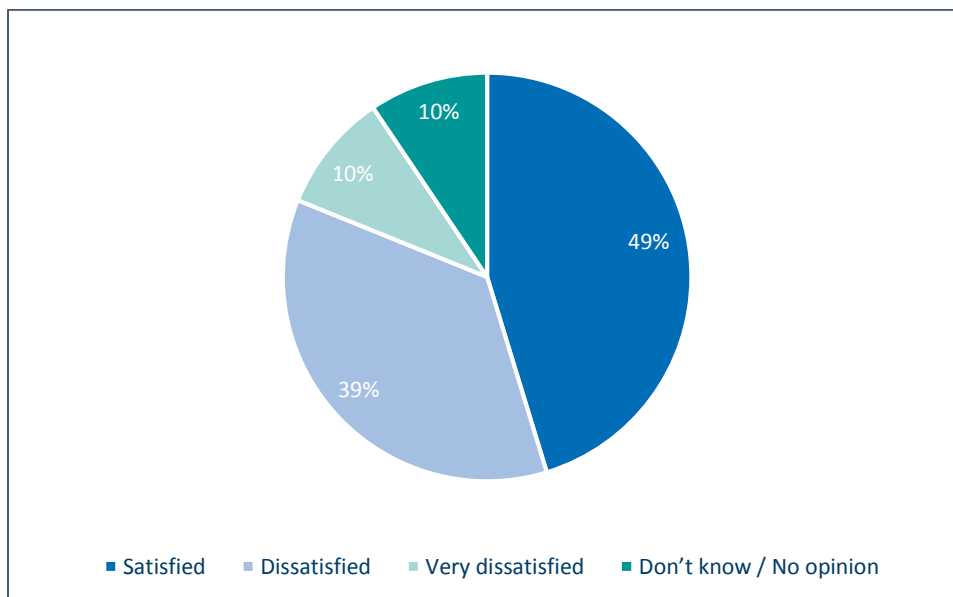
an integrated service provider has not been raised in any FABs as far as we know".

- **EU level actor:** *"Just very few FABs fulfil only some of those requirements".*
- **Ministries:** *"All FABs seem to have at least the legal frameworks in place to enable an appropriate response to the legal requirements. Still change to existing structures and choice of responsibility for ANS in every country needs political will as well as ANSPs that see opportunities in FAB-initiated activities. There are many projects (both conducted and planned) which are based on operational requirements rather than state boundaries. However, ANS provision is still defined by national boundaries, through the national ANSP. The establishment of FABs has increased the cooperation in several regions, with set governance structures which facilitate regular meetings".*
- **NSAs:** *"Regulation especially (performance) does not reflect market needs and expectations of Users. Objectives and outcomes for a FABs are not clear enough for implementation purposes".*
- **Trade Unions:** *"FABs definition is not a definition, it is the description of unrealistic objectives. FABs have been established on the base of national boundaries. No integrated providers have been established. The evidence speaks for itself. State boundaries are very much still a factor and this is unlikely to change".*

The outcome of the survey (complemented by interviews) thus indicates that overall FABs were seen to fall short of the legal definition set out in the SES framework regulation.

In a second question relating to FAB regulatory requirements, the survey enquired whether stakeholders are satisfied with the clarity and level of detail of the current SES regulatory requirements relating to FABs. There were five reply options on this question, ranging from "very satisfied" to "very dissatisfied".

Figure 41 How satisfied are you with the clarity and level of detail of the current SES regulatory requirements relating to FABs?



**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The views of respondents on this question were divided. On the one hand, almost half of the respondents (49%) were satisfied with the clarity and level of detail in the current SES regulatory requirements relating to FABs. On the other hand, almost the same percentage is accounted to dissatisfied and very dissatisfied respondents. It should be noted that none of the respondents chose the "very satisfied" option.

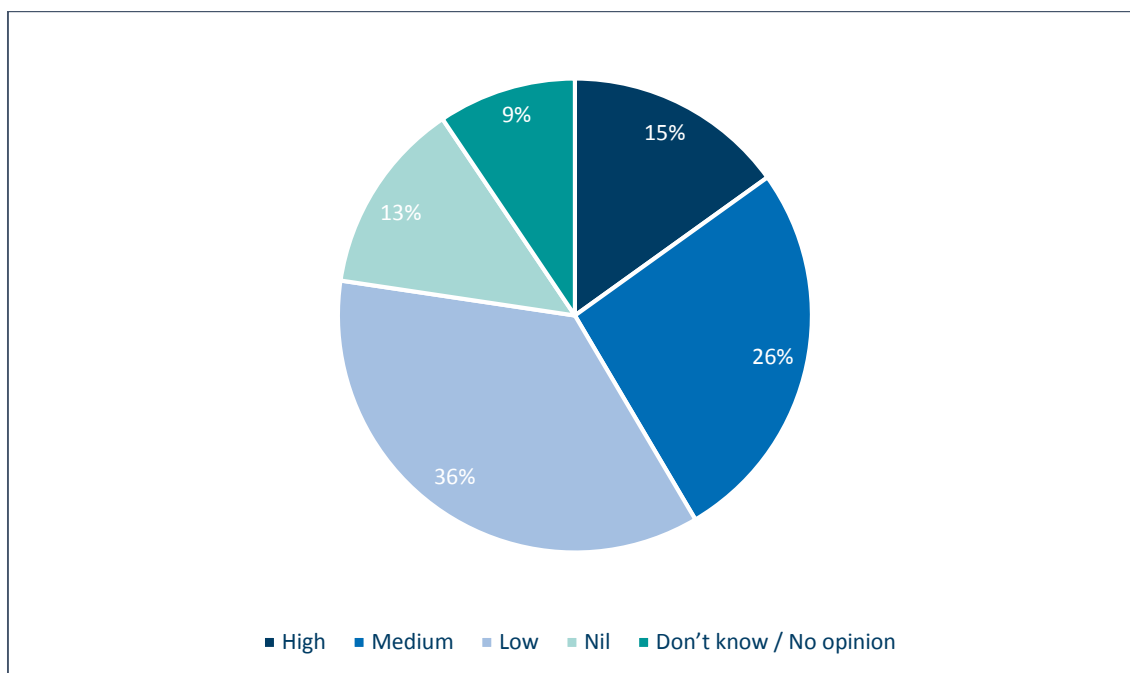
To complement the figure and results above, here are the most significant comments of the various stakeholders on this topic:

- **Airspace User or Representing Organisations:** *"The failure is not one of policy setting or regulatory clarity rather it is a failure of political willingness and implementation ambition".*
- **ANSPs:** *"The original FAB regulation sets out in very general terms what a FAB should be (i.e. Art. 2 reg. 549/2004) with a focus on airspace, which was then altered to focus on service provision in general through SES II (Art. 9a reg. 1070/2009). This broad direction required for FABs has, rather than leading to fundamental consolidation, lead to a with FABs looking at all possible areas of cooperation and pursuing harmonisation projects where possible, rather than concentrating on specific projects where business needs to align and which will bring tangible benefits. A general comment is that we would like to have less regulation and smarter regulation which gives more flexibility to the ANSPs and which reduced the administrative burdens and reduces cost. The requirements for establishing and modify FABs 176/2011 are straight forward but the wider body of regulations represent an opportunity to adopt a pick and mix approach to exert pressure on the FABs to take action. This creates confusion and complexity".*
- **EU level actor:** *"On the basis of several years of experience, it can be said that there is a need for a better link between overall network functions requirements and FAB requirements".*
- **Ministries:** *"The challenge is mostly at the political level to act in line with the spirit of the legislation".*
- **NSAs:** *"Objectives and outcomes expected for the design of FAB are not clear enough in legislation for implementation purposes".*

A third question queried about the future expectations of stakeholders regarding the evolution of the legislative framework on FABs. Whilst the Commission is proposing in the SES II+ legislative package to amend the SES legal provisions governing FABs, the respondents were asked to provide their view, considering the currently applicable SES requirements (before SES II+ adoption) on the potential for enhancing FAB implementation through legislative changes.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

Figure 42 In your view, considering the currently applicable SES requirements (before SES II+ adoption), what is the potential for enhancing FAB implementation through legislative changes?



As shown in the figure below, 49% of the respondents expect either low or no potential to improve FAB implementation through legislative changes. Only 15% are of the opinion that there would be high potential for improving FABs implementation through legislative amendments, with 26% seeing a medium potential.

To complement the figure and results above, we are providing below an overview of the comments illustrating stakeholder views on this topic:

- ANSPs:** *"Allow FABs to focus on what they are best placed to achieve through geographical location (i.e. airspace management, CNS infrastructure). Allow for a more flexible approach to the FAB partnership, where the FAB is complemented by other initiatives defined by each state which may be better mechanisms to deliver change outside the FAB structure (competition/industrial partnerships/novel technologies etc.). Natural business minded development should be pursued. There are too many critical issues that can't be solved purely through legislative changes. The EU States have still their sovereign rights over their airspace and area of responsibility according to the ICAO agreements. One needs to focus on business opportunities and not on formalities. The Free Route Airspace concept, and the FRA project, have shown that ANSPs can introduce concepts which is an added value to our customers, by cooperation and as a consequence achieving good results in an efficient manner. Any changes should support the recognition of and enable the establishment of industrial partnerships – these should not be predefined / subject to specific limitations but should be established to meet particular objectives/ circumstances in pursuit of performance targets. It is essential that States & ANSPs are credited with any performance achievements regardless of whether they are generated through FAB specific initiatives".*

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

- **EU level actors:** *"The legislative changes will provide benefits only if they call for a true network approach with a more significant role for the Network Manager".*
- **Ministries:** *"At least the legislative changes in SES II+ will help to change focus of ANSP-cooperation and collaboration as key for the FAB. The introduction of industrial partnerships to the definition of FABs will allow to avoid the current deadlock of FABs and should deliver the technological step-change and performance improvements being the basis for the SES-initiative".*
- **NSAs:** *"Industrial partnerships should be supported rather than regulatory actions".*
- **Trade Unions:** *"Legislative attempts have had no material impact so far, why would any further legislation make a difference".*

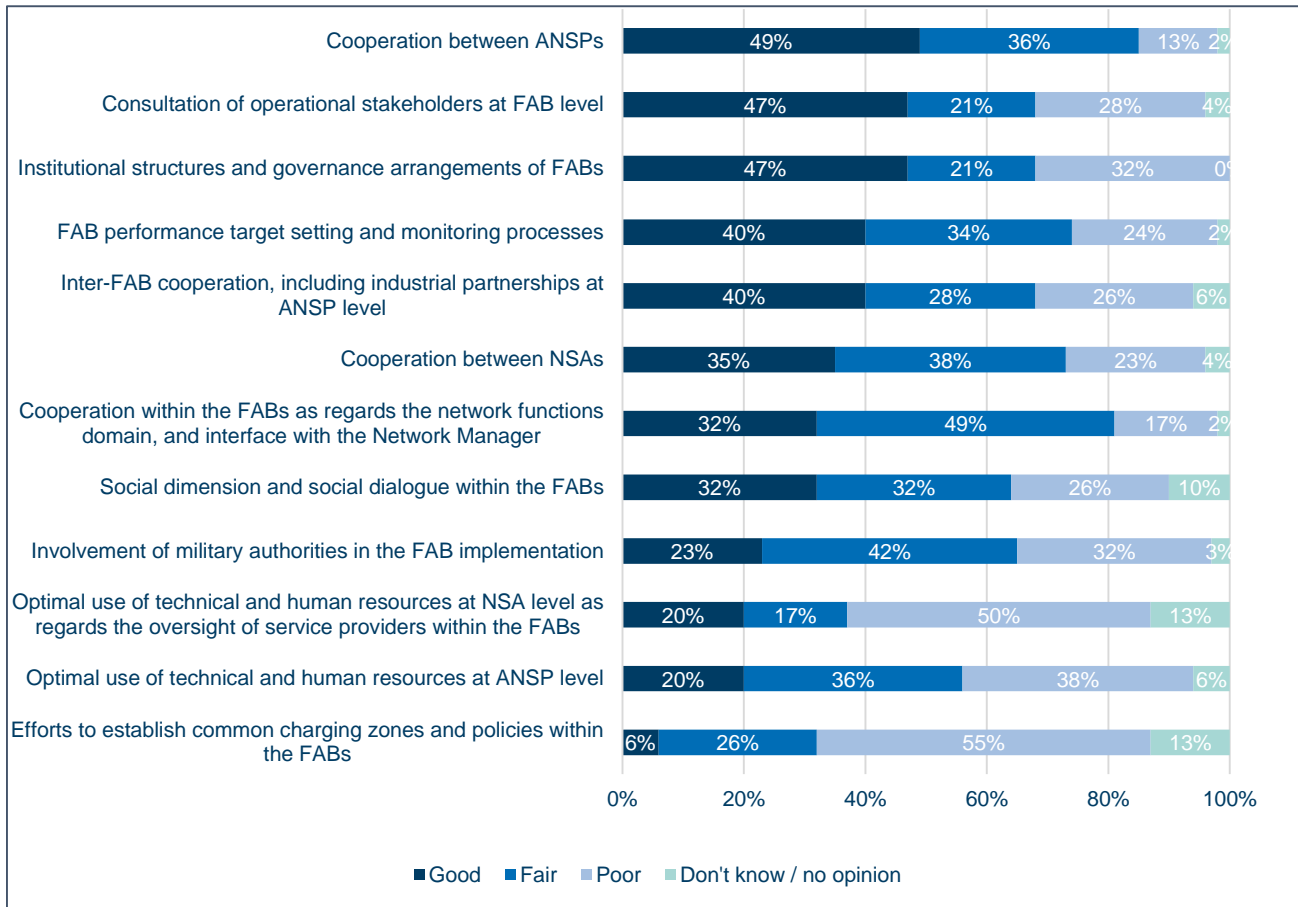
By and large, survey responses to this question highlighted the need to ensure a flexible legal framework enabling ANSPs to cooperate on business-driven initiatives. On the other hand, regulatory changes are not seen as a silver bullet leading to enhanced FAB implementation.

3.2.2.2 Institutional framework

A specific question aimed to gather stakeholder views on the FAB institutional aspects and on the related actions and processes. Figure 42 below displays the views of respondents as regards the identified FAB institutional components.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Figure 43 How would you rate the functioning of FABs as regards the following institutional aspects?



The survey respondents regarded the cooperation between ANSPs, the consultation of operational stakeholders and the institutional structures and governance arrangements of FABs as the institutional domains where FABs have succeeded best.

The least functioning institutional aspects of FABs were seen to be the efforts to establish common charging zones and policies and the optimal use of technical and human resources both on NSA and ANSP level.

It is necessary to point out that airspace user representatives expressed a divergent view (compared to the overall survey results specified above) as regards the FAB level consultation mechanisms and the FAB performance target setting and monitoring processes, which they considered to be largely inadequate.

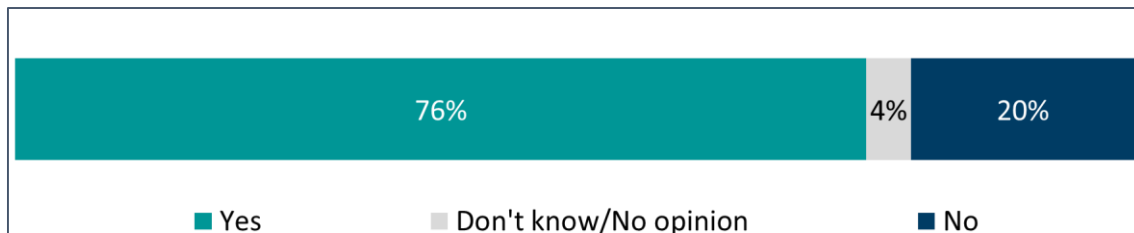
3.2.3 Technical and operational dimension

3.2.3.1 Airspace

The potential of FABs lies in their capacity to reduce fragmentation of the European airspace. FABs can support optimisation operations over larger areas of airspace than individual ANSPs, thus enabling more efficient airspace design (route and sector).

Respondents were asked a number of questions in relation to these aspects:

Do you agree FABs have the potential to deliver improved airspace configuration and management?

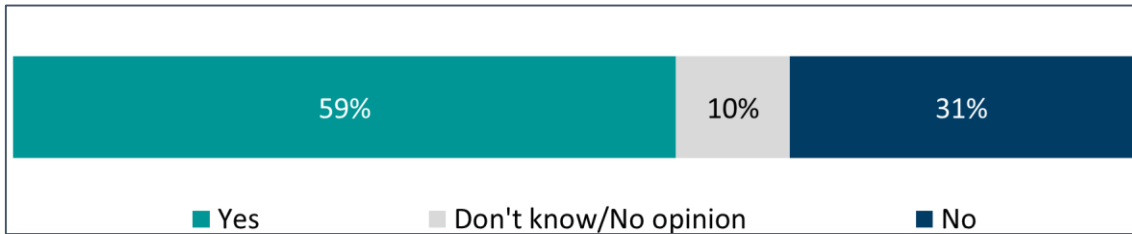


The majority view was yes, but with different perspectives from stakeholder groups as follows:

- The majority of ANSPs (81%) agreed with this question, citing the benefits of free route airspace and cross border interfaces. Some difficulties were noted with neighbouring countries outside of the EU. Reasons for not achieving improved airspace configuration and management were: lack of political will and the strength of feeling for each State to retain its ACCs.
- Only 29% of Trade union responses agreed, with a comment that nothing will change without 'a single international cross-border organisation'. It was also commented that there is insufficient political will, reluctance of airspace users to invest for the benefits. One comment was that FABs are a dream and not a real target, with users only interested in cost cutting.
- EU actors agreed (100%), noting that FABs have varying degrees of difficulty.
- Airspace users also agreed (100%).
- Military authorities agreed (67%) but noted that this may not be fully achieved given low political will and the threat of industrial action.
- Ministries also agreed (100%), noting the NEFRA initiative (North European Free Route Airspace, comprising DK-SE FAB and NEFAB) and Borealis, also including UK-IE FAB.
- NSAs agreed (79%), with comments on some hindrances such as the lack of legal powers and operational abilities of the FAB, and that it does not reflect FAB needs but cross border agreements.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

Has the work of FABs delivered improved airspace configuration and management?

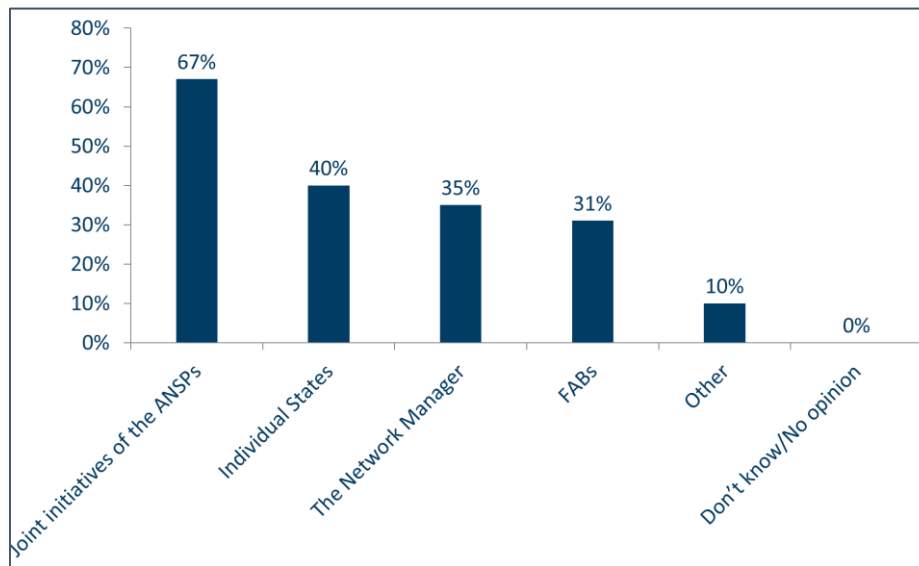


The majority view was also yes, but with different perspectives from stakeholder groups as follows:

- ANSPs responded yes (63%) and no (25%) citing some FABs with initiatives (NEFAB, BLUE MED, FAB CE) but did not cite specific improvements apart from the Borealis Free Route Airspace project. It was generally commented that such improvements could have happened in spite of FABs. One comment was that 'cooperative decision making at network level is key to ensuring a compatible network solution'. It was also commented that some improvements have been blocked by the difficulty with the number of players involved or industrial action.
- Trade unions responded 57% yes, 43% no, also commenting that changes could have been achieved without a FAB.
- EU actors were split 33% yes, 33% no and 33% no opinion, commenting that there are not uniform improvements and that the blocking factors are: too much of a 'local' approach; and the distribution of the route charges.
- Airspace users responded 100% no, saying that airspace reforms have been blocked or not progressed for myriad political and institutional reasons.
- Military authorities were split 33% yes, 33% no and 33% no opinion.
- Ministries agreed 100% yes, citing the NEFRA
- NSAs agreed (62% yes, 31% no) citing the development of free route airspace and common projects. The UK-IE FAB has carried out an operational trial of dynamic sectorisation to support 'Direct Routing' and 'Free Route Airspace' and proven some interoperability aspects between COOPANS and iTEC FDP systems. NSAs also commented that improvements have been down to operational initiatives of ANSPs/States, not at the FAB level.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The reduced airspace fragmentation that has been delivered since the establishment of FABs is largely due to:



Individual stakeholder group comments to this question were as follows:

- ANSPs responded that the joint initiatives of the ANSPs, individual States, and FABs have largely been responsible for reduced airspace fragmentation. They comment that the ANSPs are the best placed to judge what change will deliver benefits and that they are accountable for the outcomes. A concern is the increased burden from requirements to undertake airspace change consultations.
- Trade unions mostly attribute this to the joint initiatives of the ANSPs but comment that the improvements are minor.
- EU actors mostly attribute this to the Network Manager, joint initiatives of the ANSPs and States. They comment that the success factors have been good cooperation between States, ANSPs, Military and Network Manager, but further achievement needs a true borderless environment.
- Airspace users answered 'other', saying that there have been no improvements.
- Military authorities responded Individual States, FABs and the Network Manager as the leading contributors.
- Ministries responded 'other', FABs and Individual States, saying that fragmentation is not an issue in that airspace optimisation is achieved by States in cooperation with Eurocontrol. It was also commented that changes need State/Political commitment to implement.
- NSAs responded that the joint initiatives of the ANSPs, the Network Manager and FABs have made the main contribution. They note that ANSPs do not need FABs for such cooperation and reference the Borealis Alliance as achieving defragmentation through introduction Free Route Airspace.

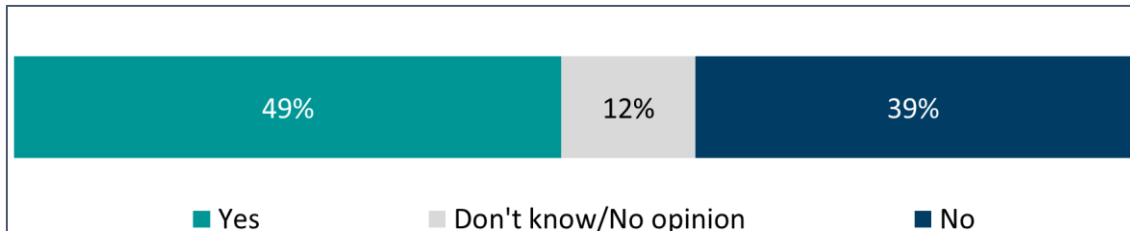
**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

3.2.3.2 Military airspace

The military are included in FAB governance arrangements. FABs can provide a means of engagement with the military across national borders to accelerate cross border FUA to help improve airspace optimisation.

Respondents were asked:

Do you agree FABs have the potential to reduce the impact of military airspace on the efficiency of airspace configuration and management?

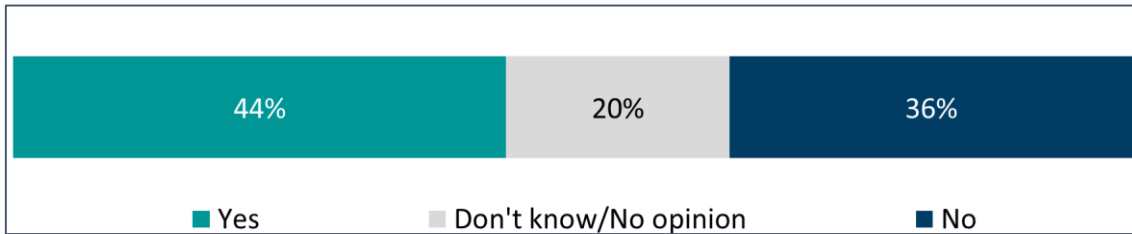


Whilst the majority agreed, the individual stakeholder groups commented as follows:

- ANSPs responded 50% yes and 38% no. It was commented that a FAB is not needed to bring together the various parties and resolve issues, provided the right consultation processes are in place. Problems are the budget cuts faced by military authorities, constraints due to sovereignty, NATO/non-NATO and the limited effect of regulations on the military.
- Trade unions responded no (71%) and yes (29%), citing problems as military reluctance to cede sovereignty, lack of political will, and a desire from military to maintain the status quo.
- EU actors agreed (yes (67%), no (33%)) but it was commented that improvement really needs FAB level AMC and civil-military coordination procedures and prioritisation rules at FAB level.
- Airspace users were 100% in agreement.
- Military authorities disagreed (no (67%), yes (33%)), commenting that the EC attributes the lack of efficiency on military users but the major cause is ANSPs.
- Ministries were split 50:50,
- NSAs responded 54% yes and 31% no. In the UK-IE FAB it was noted that military organisations have direct input in the FAB Management Board and that the NSA is a joint and integrated organisation, both aspects contributing to engagement of the military. In other areas NSAs commented that FABs were simply not a priority in respect of military needs and that improvements to date were not the result of FABs but stem from the other SES regulations.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

Has the engagement of the military within the FABs delivered improved airspace configuration and management?

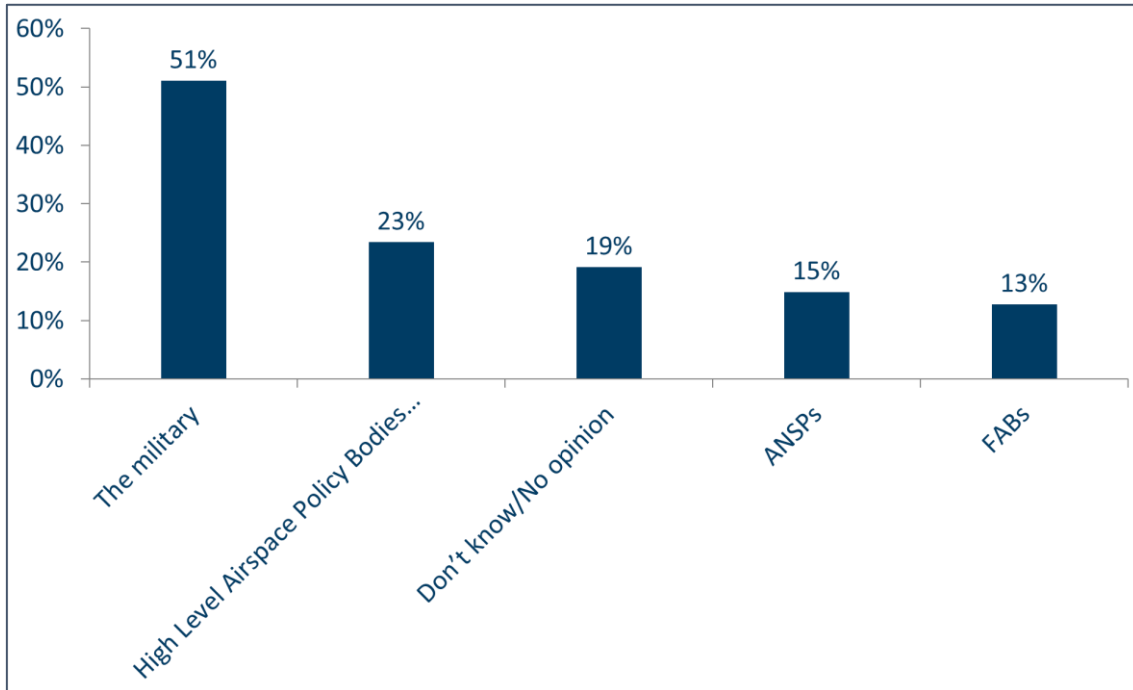


A smaller majority responded yes to this question, with the following comments per stakeholder group:

- ANSPs answered yes (50%) and no (38%), with one respondent citing the French-Swiss border where a cross border area was implemented (FABEC SE). It was also commented that the same effects could have been achieved outside of a FAB. It was further commented that the military are not well engaged with some FABs.
- Trade unions answered no (57%) and yes (43%), commenting that some States have good civil-military development and others do not.
- EU actors said no (67%) and yes (33%). This was because although there have been lots of design studies there has been little implementation.
- Airspace users answered 100% yes.
- Military authorities responded yes (67%) and no (33%). It was commented that whilst military participation in FUA is very useful it is not a FAB creation.
- Ministries answered 50% yes and 50% no. FUA was viewed as a national process, ongoing before the creation of the SES.
- NSAs responded yes (43%) and no (36%). It was commented that military requirements have been accounted for outside of the FAB.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Respondents were further asked what **“the greatest challenge for the military dimension of FABs and their engagement across national borders to accelerate cross border FUA is”**:

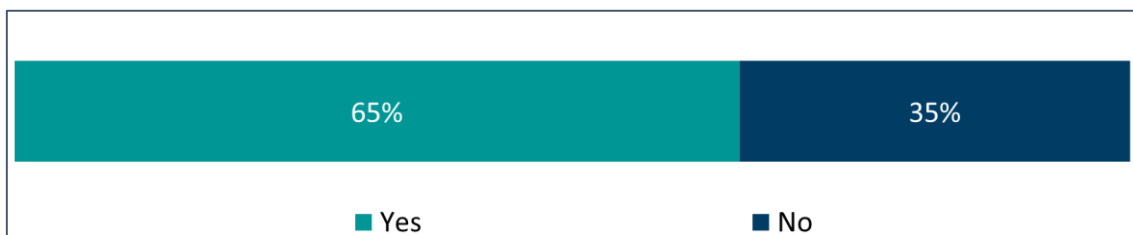


3.2.3.3 Planning

The process of implementing FABs includes (a) the development of operational and technology plans to deliver SES objectives and (b) ANSPs to share accountability for those plans.

Respondents were asked:

As a stakeholder, have you seen the FAB’s operational and technology plans relevant to your organisation?



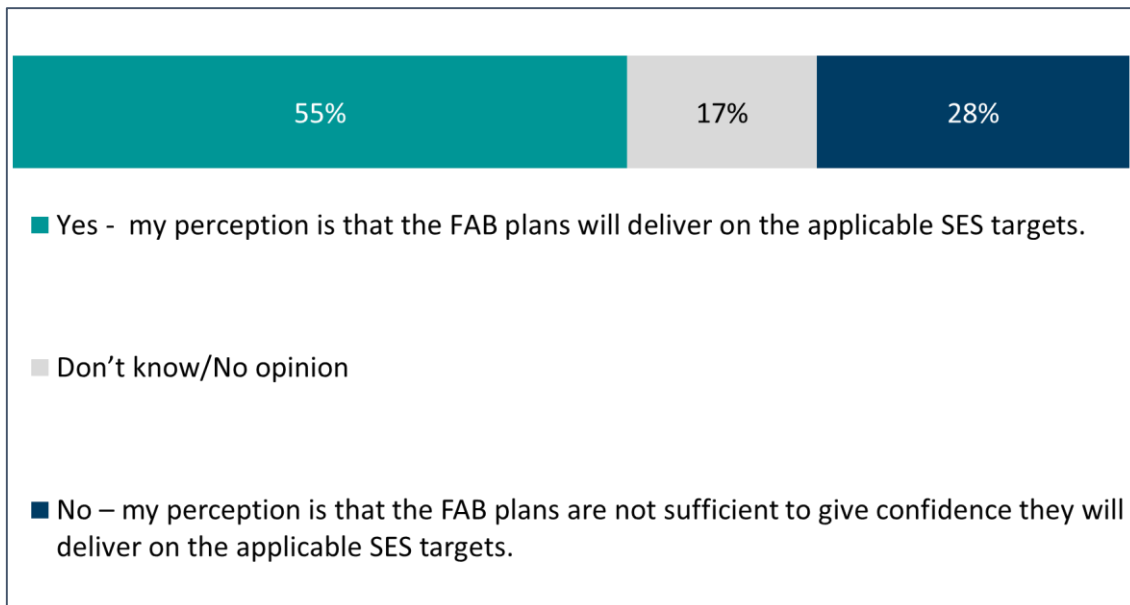
Whilst the majority agreed, the individual stakeholder groups commented as follows:

- ANSP respondents answered yes (75%), some example plans such as the FAB CE CNS cost containment study (updated annually), NEFAB annual and 5-year plan. One respondent commented that there was no specific operational or technology plan, two other respondents commented that they had no such plans.
- Trade unions answered no (83%) and yes (17%), attributing this to lack of consultation and social dialogue.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- EU actors responded yes (100%), as a result of direct cooperation with FABs, although not all were willing to share information.
- Airspace users answered no, referring to any plans that they thought were meaningful, but have seen some plans.
- Military authorities said yes (67%) and no (33%).
- Ministries said yes (75%) and no (25%). One commented that these plans are not produced.
- NSAs answered yes (69%) and no (31%). Comments were that these are seen as part of safety oversight, as part of FAB committees or other regulatory oversight. One respondent commented that NSAs were not directly involved in this process.

Respondents were further asked, **"In the case that you have seen FAB operational and technology plans, are they consistent with supporting the SES performance targets at FAB level?"** Most respondents agree that the FAB plans will deliver on SES targets:



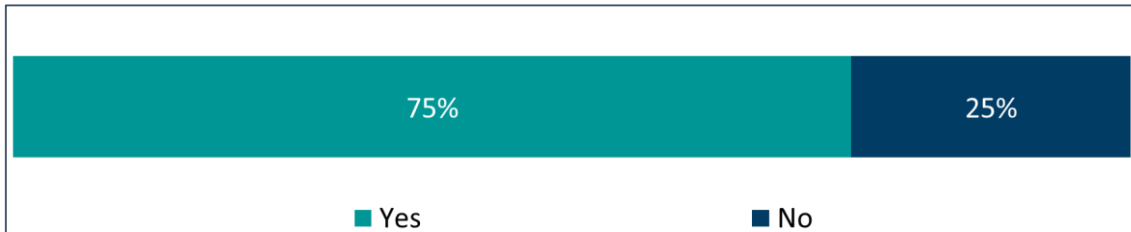
3.2.3.4 Efficiency

The capacity of FABs to drive efficiencies should accelerate direct benefits beyond the capacity of an individual ANSP. FABs can share resources and best practices between them, along with creating economies of scale in areas of: systems development and implementation, shared services (MET, AIS etc.).

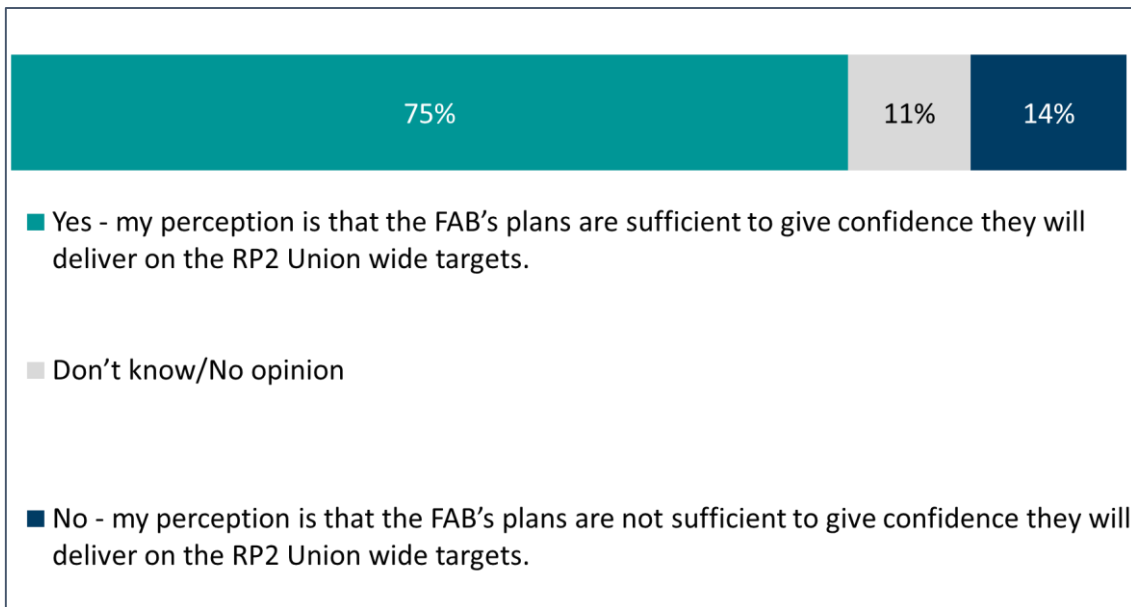
Respondents were asked:

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

As a stakeholder, have you seen plans that present how the FAB will drive efficiency (e.g. FAB performance plans, cost benefit analyses and implementation plans) relevant for your organisation? The majority answered positively:



Those respondents who have seen plans were asked: **“do you agree that they sufficiently contribute to the RP2 Union wide targets?”**. The majority answered yes:



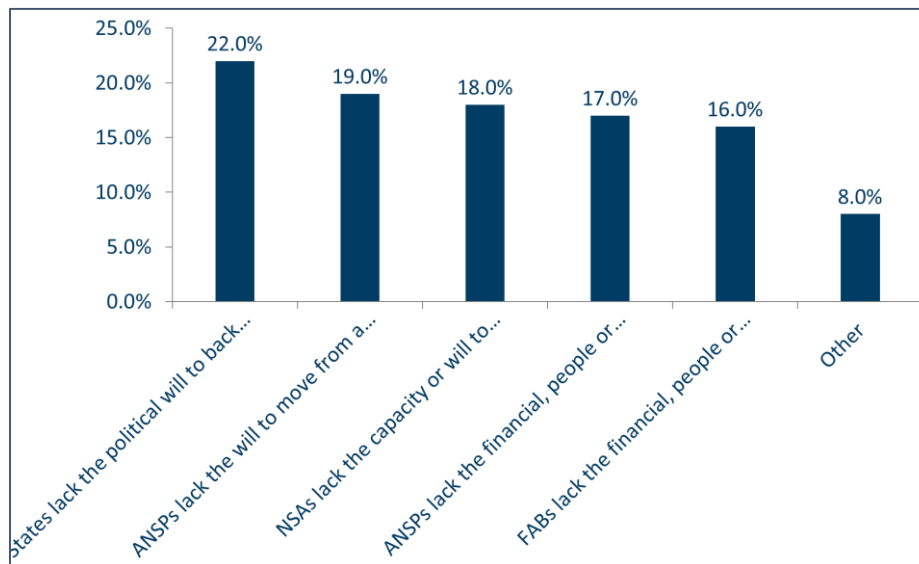
Respondents were further asked **“Do you agree that the FAB’s plans (e.g. performance plan, cost benefit analysis and implementation plans) are realistic and have an adequate level of ambition?”**. Comments to this question were as follows:

- 50% of ANSPs thought all FAB plans were realistic and 83% thought that they had adequate ambition. There was one negative comment, that FAB performance plans have no ambition.
- Trade unions were almost as positive as ANSPs, with 67% responding that all FAB plans were realistic but only 33% believing that they were ambitious.
- EU actors thought that only some FAB plans were realistic (67%) and had adequate ambition (33%)

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

- Airspace users thought that no FAB plans were realistic or had ambition, commenting that no plan has been seen that demonstrates a genuine commitment to share resources across FABs.
- Military authorities did not respond to this question.
- Ministries tended to think that the FAB plans were realistic (100%) but were less certain that they were ambitious (33%).
- NSAs were generally positive, with 100% backing of plans being realistic and 75% viewing them as ambitious.

Following from this, respondents were asked, **"In terms of the challenges to the FAB's operational plans implementation - please rank the challenges 1 to 5 [1 is the most challenging issue]?"**. The results are given as weighted average from all answers contributed by 45 respondents:

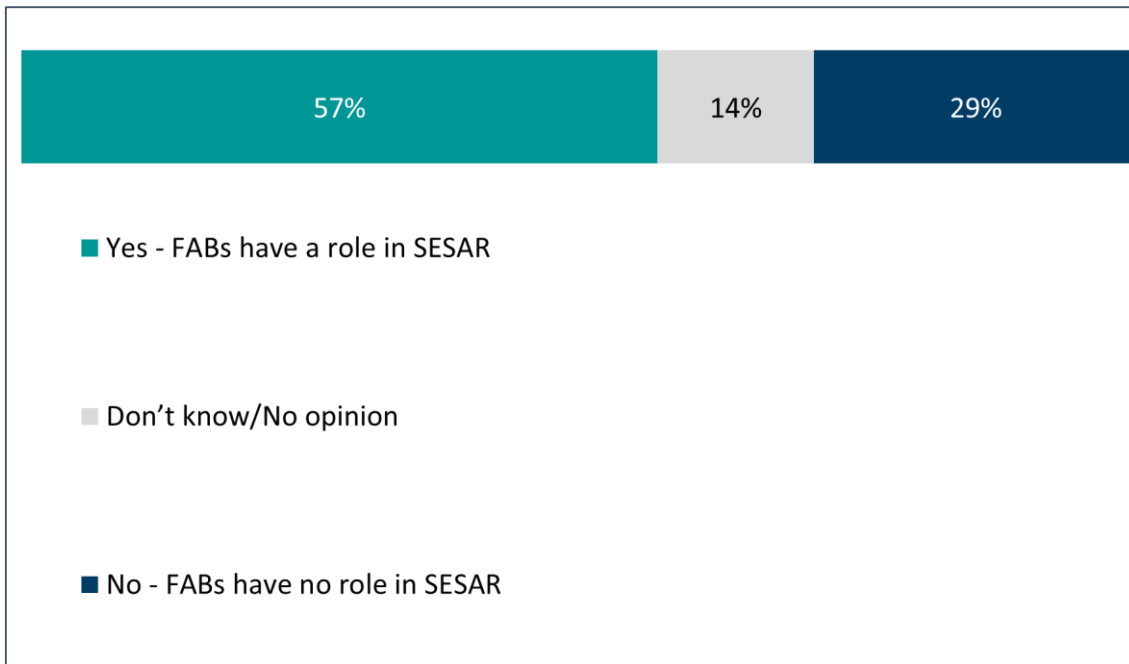


**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

3.2.3.5 Technological dimension

FABs should assist the 'technological dimension' of SES through coordinating the synchronised deployment of Common Projects at FAB level and adoption of procedures to deliver interoperability within the FAB and with neighbouring FABs. The survey asked:

Do you agree FABs have a critical role in delivering the technological dimension of SES?

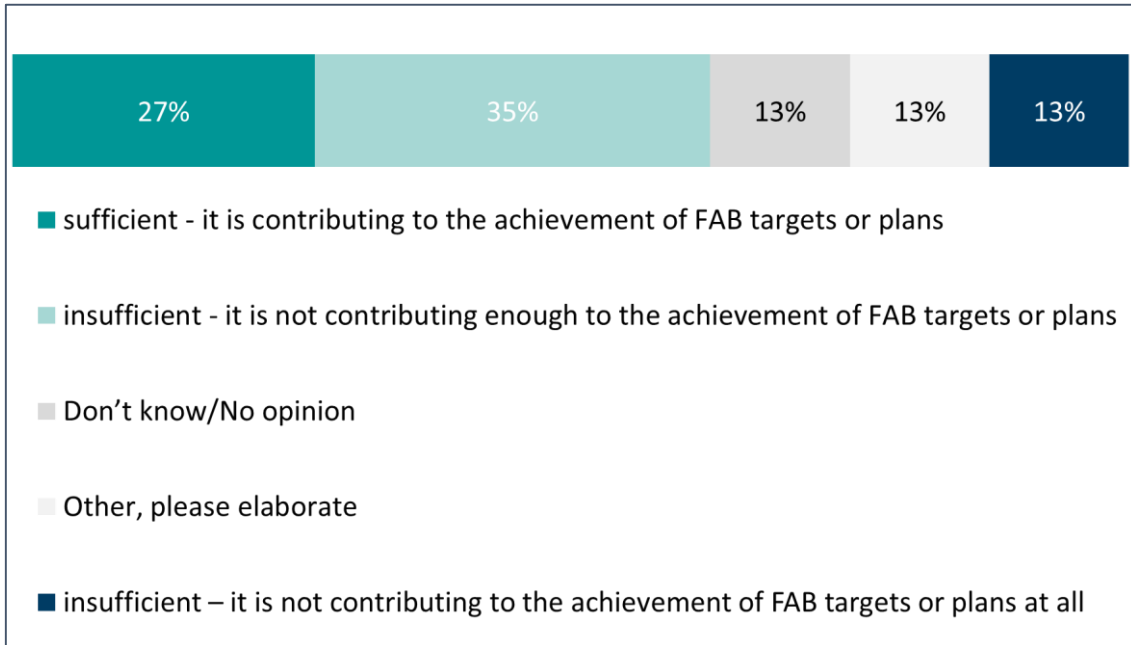


Accompanying the above answers, the respondents commented as follows:

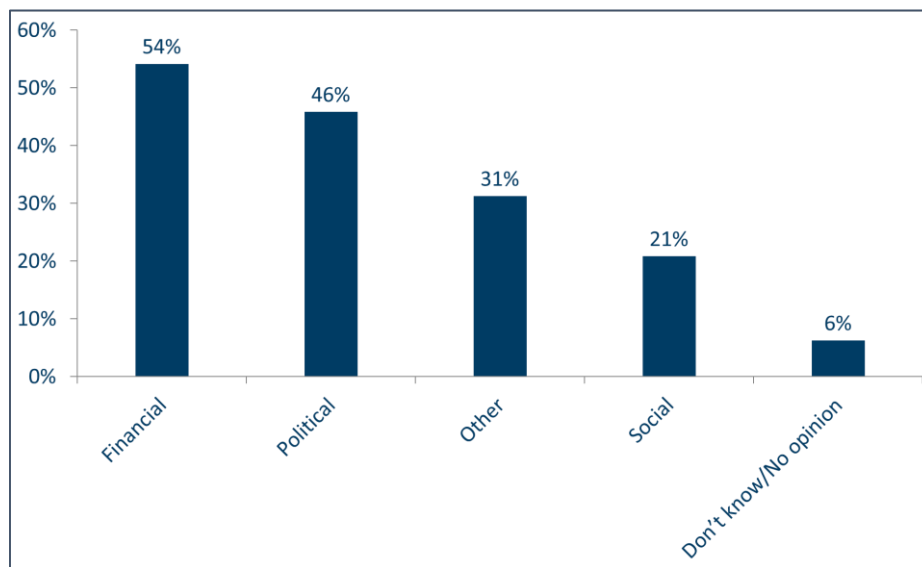
- ANSPs answered 75% yes, 25% no, citing annual plans and RP2 performance plans.
- Trade unions answered 57% yes, 43% no, commenting that FAB performance plans are available through the PRB.
- EU actors answered yes (100%), with the plans received as part of regulatory or cooperation needs.
- Airspace users answered no (100%).
- Military authorities said yes (67%), no (33%).
- Ministries said yes (100%), with a comment that performance plans were an aggregation of State-level without any clear or overarching FAB component. NEFAB was cited as having a FAB strategy but that it is difficult to agree a rolling implementation plan.
- NSAs answered yes (83%), no (17%). Q70: Adoption of common interoperable technologies within and between FABs appears to be?

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

They were further asked what the **“Adoption of common interoperable technologies within and between FABs appears to be?”**. Responses were that this is mostly insufficient:



Respondents were asked what **“The greatest challenge to implementation of common interoperable technology platform is?”**, with choices indicated in the figure below:



Comments to this question were as follows:

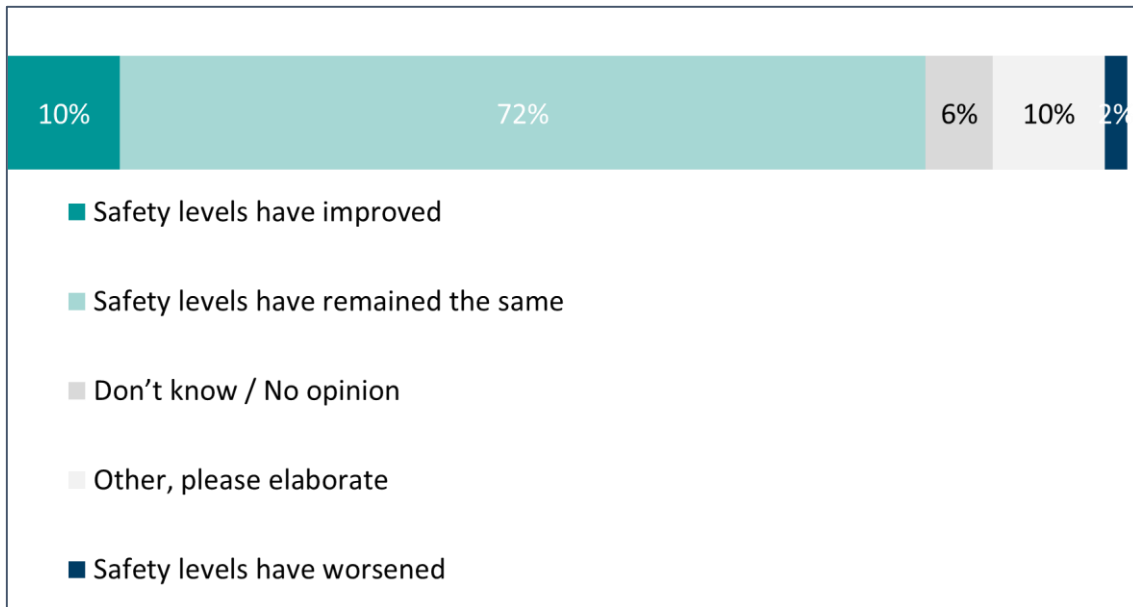
- ANSPs answered that the greatest challenges were financial (69%), political (44%) and 'other' 38%. It was generally commented that joint technology implementation is complex, with different systems, system lifecycles and requirements.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- Trade unions also said that the greatest challenges were financial (71%), political (57%) and 'other' 14%.
- EU actors thought that political and social challenges were equally an issue (67%). It was commented that the question is not relevant and should relate to the FABs role in delivering performance, not technology. Furthermore, the answer is the centralised services delivered at Pan-European level plus additional regional projects. It was also commented that the political will for defragmentation (e.g. through common platforms) is not yet there, and that this is probably due to the social dimension.
- Airspace users identified the challenges as political and social.
- Military authorities did not respond to this question.
- Ministries responded 'other' (75%), financial (50%) and political (25%), also stressing that joint technology implementation is complex, with different systems, system lifecycles and requirements.
- NSAs responded financial (50%), political (42%) and 'other' (17%), commenting on the different requirements that drive technology choice and also differences in system lifecycles. It was also commented that ANSPs do not have sufficient income to invest after the performance scheme targets have been met.

3.2.3.6 Safety

Respondents were asked **"To what extent have FABs affected current safety levels?"** They responded mostly that safety levels have remained the same:



3.2.4 Economic and financial dimension

3.2.4.1 Increased flight efficiency and delay reductions

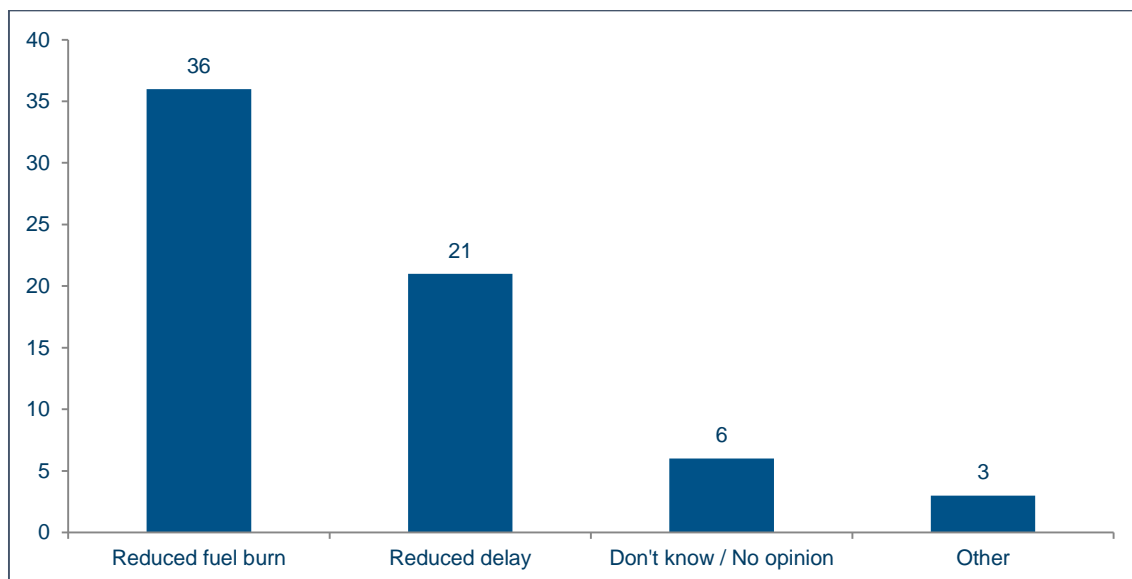
With establishment of a proper FAB system, the following benefits to airspace users are projected:

- Cost savings related to reduced fuel consumption, by enabling airplanes to fly straighter routes at better altitudes;
- Cost savings related to reduced delays (improved quality of service).

These changes would, in turn improve the overall service delivered to passengers (time and cost savings), along with bringing benefits to the environment in terms of lowering emissions.

Figure 44 shows the number of respondents indicating whether the identified financial benefits to airspace users have materialised as a result of the establishment of the FABs. As can be seen, on an overall level, financial benefits related to reduced fuel burn as a result of FAB initiatives are more frequently cited than those accruing from reduced delays, indicated by 62% and 36% of respondents, respectively. Comments accompanying these responses are summarised below.

Figure 44 Has the implementation of the FAB directly resulted in any financial benefits to airspace users? (N=58)



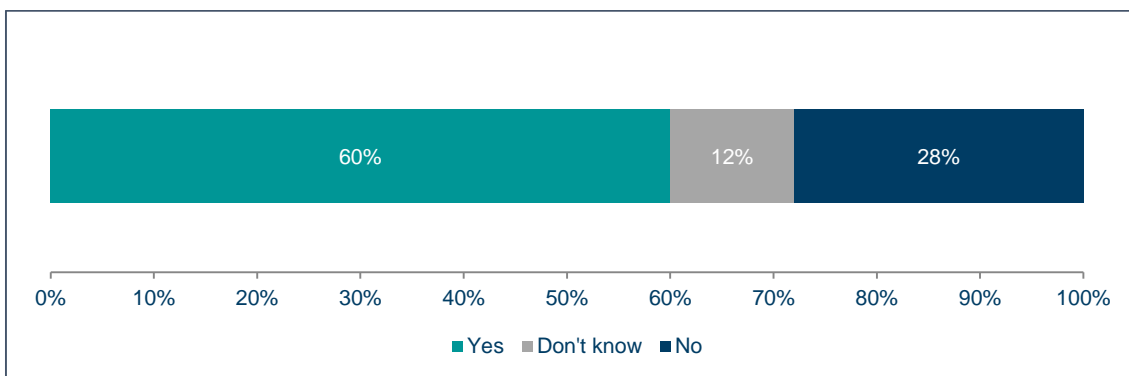
Among respondents indicating that FABs have resulted in reduced fuel burn benefits, the majority point to the implementation of cross-border airspace structures resulting from FAB initiatives, in particular FRA and more direct routes. Similar comments are provided in relation to benefits from reduced delays. According to respondents, FRA offers the opportunity to airspace users to optimise flight trajectories, which enables them to reduce fuel burn and consumption, as well as to avoid delays. Two respondents point to NEFAB, DK/SE and DANUBE FAB as leading cases on such cross-border airspace structures. One ANSP further observed, however, that the size of benefits from more

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

efficient routing and/or more effective management of traffic flows varies across FABs. The interviews conducted with airspace users to complement the survey however indicated that airspace users have not experienced any real progress in in cost-efficiency, resulting in increased charges to airlines and slow progress in reorganising airspace. This then causes delays and more fuel burn. There have been some achieved benefits in flight efficiency, but only from direct routing and not stemming from any synergies or ACCs combining. According to the airspace users, the FABs should have been improving traffic flows, driving cost efficiency, et cetera, but traffic flows have not improved, economies of scale have not realised to the extent they expected, there has not been rationalisation of control centres.

At the same time, among those who indicate 'don't know / no opinion' (6 respondents, 10%) and 'other' (3 respondents, 5%), the view is that the related FAB initiatives which have contributed to the realisation of the aforementioned benefits (for instance, the implementation of FRA), could have been implemented in the absence of the FAB, and therefore the benefits are not necessarily reliant on the existence of FABs. The interviews with airspace users also support this view: it was said that nothing significant can be concluded from any FAB and projects could have been done outside of the FAB. The prevalence of this view is further illustrated in Figure 44. When asked to reflect on whether the financial benefits as identified in Figure 44 above could have been achieved in the absence of the FABs, the majority of respondents (60%) believe the achievements could have been obtained in the absence of FABs. Less than a third of respondents hold a more positive view, believe the achievements to be the direct result of FAB initiatives.

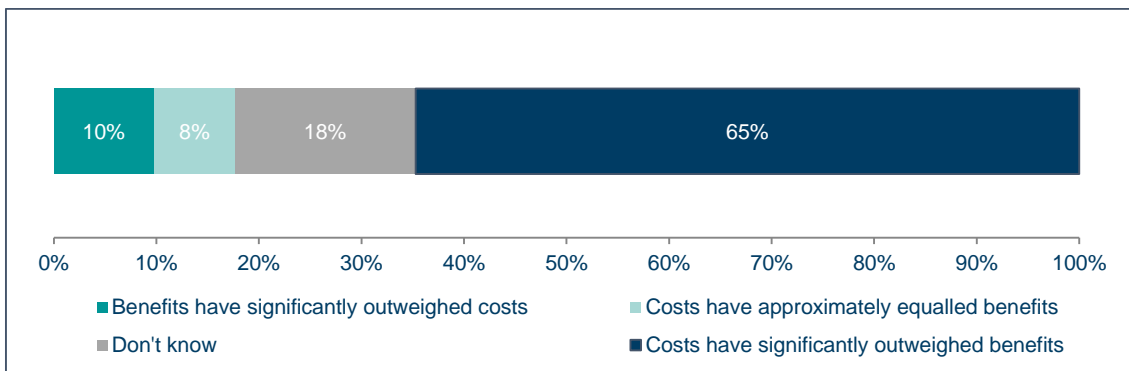
Figure 45 Do you believe that the financial benefits as mentioned in the previous question (reduced fuel burn; reduced delays) achieved could have been achieved in the absence of the FABs? (N=50)



Respondents offer a highly negative assessment of the overall efficiency of the FABs system to date, as shown in Figure 45, with more half (65%) indicating that costs incurred to establish and ensure the continued functioning of the FABs have significantly outweighed the resulting benefits. Just 10% indicate that benefits achieved have (significantly) outweighed the costs incurred, while a further 8% indicate that the costs have approximately equalled the benefits. Comments accompanying these responses are summarised below.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Figure 46 To what extent do you agree that the benefits resulting from the creation of FABs outweigh the costs incurred to establish and ensure the continued functioning of FABs? (N=51)

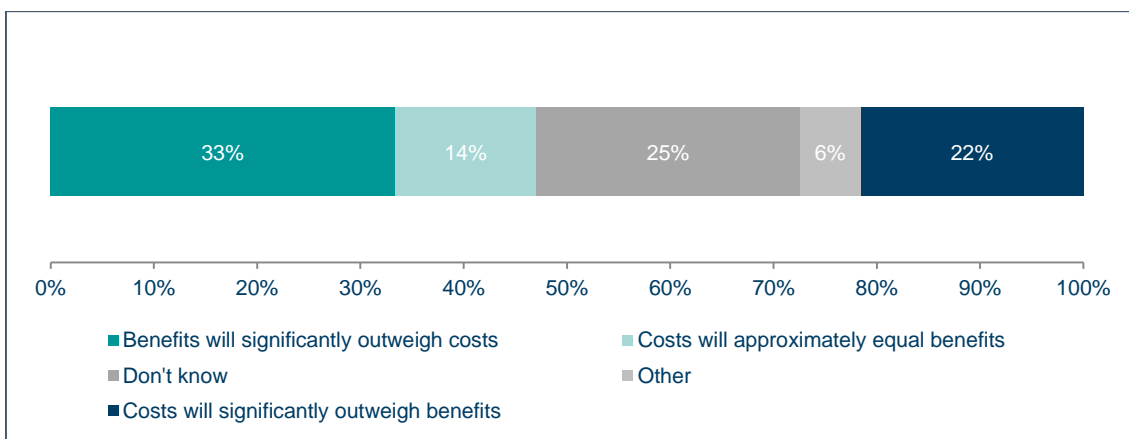


Where costs are said to outweigh benefits, the prevalent view is that enormous investments made by ANSPs have not been met with any direct and/or visible benefits, while also imposing additional compliance costs to all parties. EU-level representatives noted the excessive number of overhead structures within the FABs, causing lengthy decision-making procedures, while one ANSP referred to the Regulatory requirements underpinning FABs, which have increased costs related to additional governance and reporting requirements. According to one ATCOs representative body, the money would have been better spent had the costs to implement the FABs instead been sent directly to the airlines.

There was also a view, expressed by an ANSP, that the implementation of FRA, which has the potential to bring about reductions in fuel burn for their customers, could have been achieved in the absence of the FAB. However, the creation of the FAB sped up the process.

Respondents were also asked to take a future-looking perspective on the potential benefits to be realised relative to costs incurred in 10 years' time. **Figure 47** shows the distribution of responses.

Figure 47 In 10 years' time, will benefits resulting from the creation of FABs outweigh the costs incurred to establish and ensure the continued functioning of FABs? (N=51)



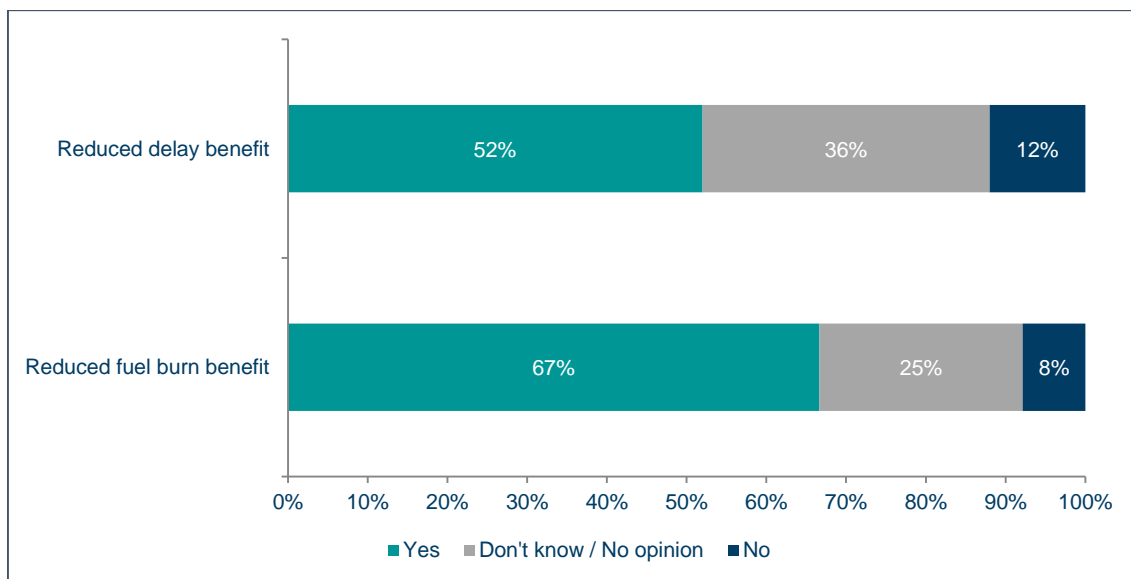
**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Overall, respondents offer a more positive assessment of the future potential of FABs, with 33% (up from 10%) expecting future benefits to ultimately outweigh the costs incurred to establish and maintain the FABs. By contrast, only 22% maintain a negative view of the future potential of FABs.

The distribution of responses per stakeholder type is rather balanced between the response categories. ANSP, NSA and Ministry representatives responding on behalf of the same FAB noted the enormous amount of effort that was involved with identifying and driving forward FAB projects, which have not yet been met with any significant cost reductions. However, these respondents offer a positive future outlook, expecting that the initial investment will bring benefits going forward. Another respondent, representing a Ministry, acknowledged the long-term potential for FABs to become the preferred vehicle to fulfil more challenging performance requirements, depending on the ability of stakeholders to set such requirements in the future.

Respondents were then requested to indicate whether the financial benefits that have been delivered to airspace users (i.e. reduced delays and reduced fuel burn, respectively) since the establishment of FABs, could be achieved if the activities under FABs were organised or regulated in a different way. For both benefit categories, the majority of respondents (67% in the case of reduced fuel burn and 52% in the case of reduced delays) judged that the same financial benefits could be achieved if FAB activities were organised and/or regulated differently. Just 8% disagreed in the case of reduced fuel burn, and 12% for reduced delay benefits. Figure 48 shows the distribution of the responses. Comments and related proposals accompanying these responses are summarised below.

Figure 48 Could benefits be achieved if the activities under FABs were organised or regulated in a different way? (N=50, 51)



The prevalent view among the respondents is that FABs should be optimised around aviation geography, rather than political geography and that collaboration should focus on business opportunities and cooperative endeavours between ANSPs, not on the formalities related to FABs. It is argued that ANSP-level cooperation is the best way

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

forward in terms of achieving the best results for their customers. To this end, several respondents mention the lack of flexibility given to ANSPs under the FAB systems. According to one respondent, benefits arising from reduced delays and reduced fuel burn do not depend on the FAB at all, but rather stem from the ability of ANSPs / ATS and the NM to bring them about.

There was also a view expressed by 2 EU-level stakeholders that a re-enforcement of the network approach will bring more significant benefits. Another respondent asserted that that the Network Manager could have been given a stronger mandate under the current legal framework to impose the necessary changes to route structures and general airspace issues.

Further proposals for how FAB activities could be alternatively organised and/or regulated in view to facilitating the achievement of financial benefits resulting from **reduced fuel burn** were:

- Normal bilateral and multilateral collaboration focused on improving airway structures and route development, including FRA, could have produced the same results with less costs.
- Allow each ANSP/Country decide on the best way to reach established targets.
- Allow ANSPs to operate commercially, share benefits with the airlines and consolidate.

One ANSP respondent offered a positive assessment while pointed to the importance of cultural influences, commenting that the benefits achieved in ATM "have been inspired by the combination of SES initiatives among which a cross cultural dimension created by the FAB has contributed." The respondent explained that the cross cultural dimension within this particular FAB enabled the stronger performing ANSP to promote the good practices that were already been in place at the ANSP level, helping the FAB partner to achieve a reduction of fuel burn "thanks to a new operational organisation within [the Member States] airspace".

For **reduced delay benefits**, the elaborated views of respondents were more or less the same as for reduced fuel burn benefits, only with greater emphasis on the need for a network approach and more involvement of the NM.

Among those who answered 'Don't know / No opinion', the detailed comments for both benefit categories point to the absence of any study to support making such a claim one way or the other.

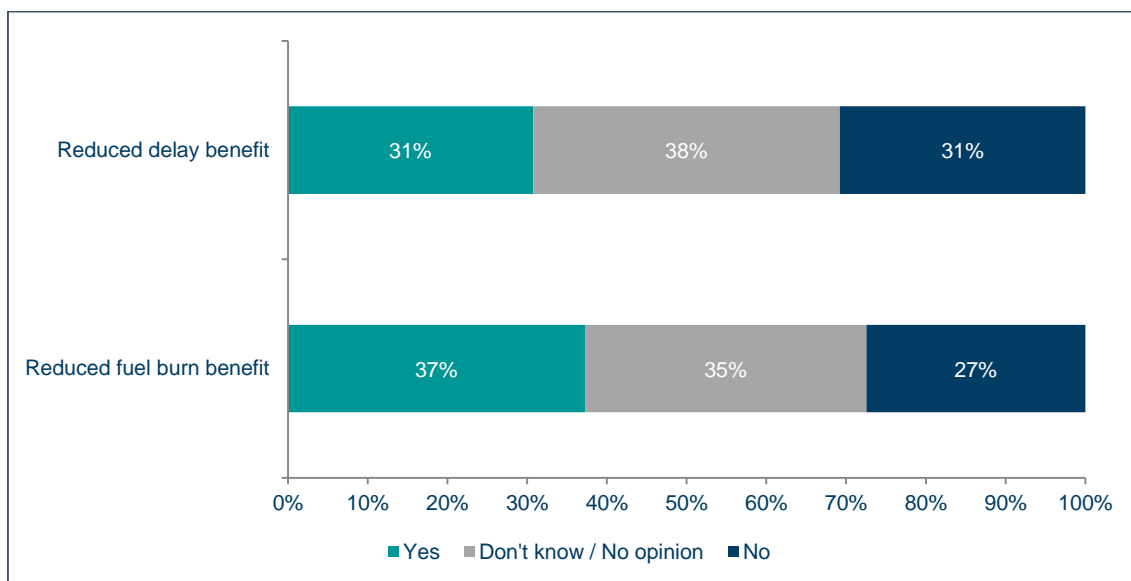
Related to the above question, respondents were then asked whether the size of delay reductions and fuel burn reductions, respectively, could have been higher had the FAB initiatives been organised in a different way. In other words, did the current organisation of FAB activities prevent the full potential of reduced delays and reduced fuel burn from being realised? Figure 49 shows the distribution of the responses.

Given the large number of '*Don't know / No opinion*' responses, the results are more difficult to interpret. Data limitations notwithstanding, it can be observed that in both cases, the number of '*No*' responses is significantly higher than under the previous

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

question (Figure 48). That is, a higher number of respondents do not necessarily believe that the current organisation of FAB activities is in any way preventing the full realisation of benefits; Similarly, whereas a majority of respondents hold the view that benefits delivered could have been obtained if FAB activities were organised or regulated differently (Figure 48 above), a much smaller number of respondents expects that benefits would be higher than those already achieved. Comments accompanying these responses are summarised below.

Figure 49 Could the amount of reduced fuel burn / reduced delays be higher had FABs been organised in a different way? (N=51, 52)



According to one Ministry representative, it is not a given that the optimum solutions are found when the players involved have vested interests. In reference to reduced fuel burn, the same respondent referred to "charging/revenue distribution from traffic linked to route structures". Another raised issue with the cumbersome nature of FAB structures and urged greater flexibility for those who want to be commercial and to allow consolidation. Respondents again argued in favour of re-enforcing the network approach and allowing greater flexibility to ANSPs.

In reference to delay reduction potential, one ANSP noted that delays are mostly a local issue, and thus cannot always be addressed via FAB-level actions. Two ANSPs point to the fact that delays cannot be further reduced if they do not exist to begin with. There was also a view, expressed by one trade union / staff representative organisation that stakeholders would have at least been able to achieve the same results at much lower costs.

3.2.4.2 Resource efficiency measures and best practices

In the context of the discussions at the Council of the EU on SES II+, a number of criteria and related actions were agreed with Member States concerning the most efficient use of technical and human resources in a FAB. These include, but are not limited to:

- Joint training and training infrastructure of ANS personnel

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

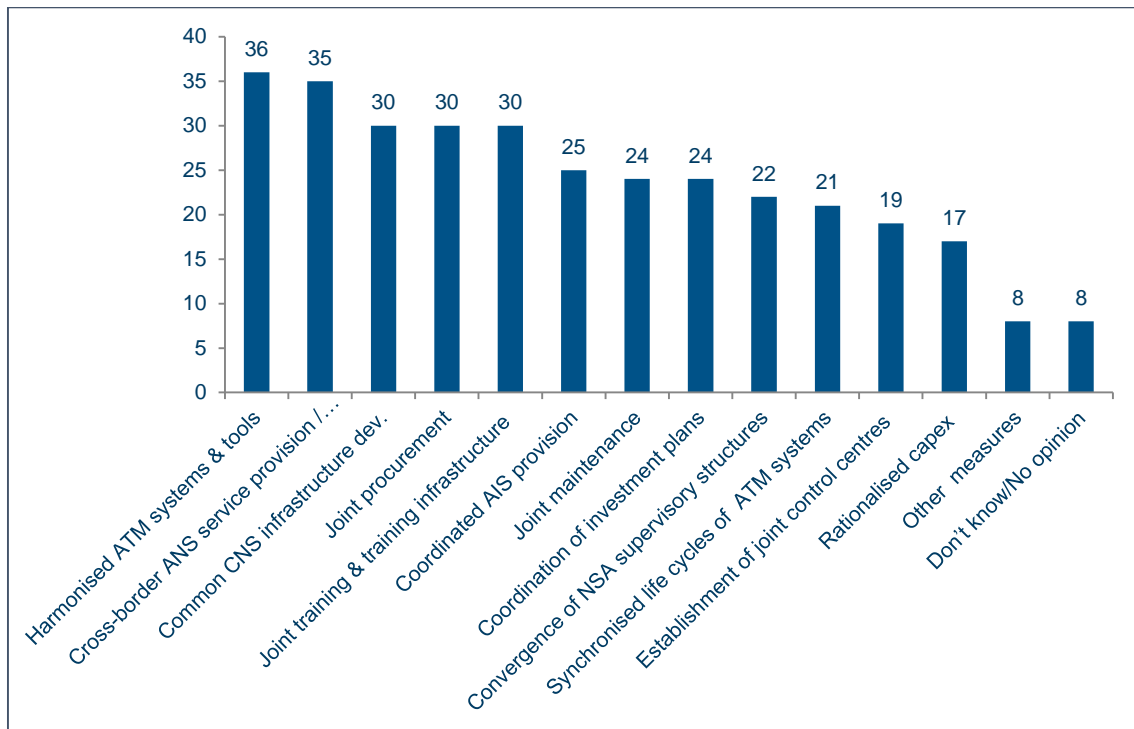
- Joint procurement
- Joint maintenance
- Synchronised life cycles of technical ATM systems
- Harmonised ATM systems and tools
- Rationalised capital expenditures (CAPEX) which suitably addresses all developments needed for suitable ATM in the long term
- Coordination of ANSPs' investment plans
- Establishment of joint control centres whenever beneficial
- Common CNS infrastructure developments
- Cross-border service provision or cross-border delegation of ANS
- Coordinated AIS provision
- Convergence of supervisory structures involving NSAs, joint contingency arrangements

Respondents were asked to indicate, based on their experience, which among the identified resource-efficiency measures have contributed to improving internal efficiency within FABs. As shown in Figure 50, the most frequently cited resource-efficiency measure is *'Harmonised ATM systems and tools'*, which is indicated by 62% of respondents that gave an answer to this question, followed by *'Cross-border service provision or cross-border delegation of ANS'*, indicated by 60% of respondents. These are followed by *'Common CNS infrastructure developments'*, *'Joint procurement'* and *'Joint training and training infrastructure of ANS personnel'*, each indicated by 52% of respondents. At the other end of the resource-efficiency scoring, just 29% of respondents indicate *'Rationalised capex which suitably addresses all developments needed for suitable ATM in the long term'* and 33% indicate *'Establishment of joint control centres whenever beneficial'*.

Comments accompanying these respondents, including examples of best practices, are summarised for each resource efficiency measure.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

Figure 50 Which of the following resource efficiency measures apply to improving internal efficiency within a FAB? (N=58)



Harmonised ATM systems and tools

ANSP, NSA and Ministry respondents pointed to the fact that needs for ATM systems are not necessarily dependant on geographical proximity, but rather on complexity.

Suggested best practices were:

- Consolidation of the market, towards one manufacturer
- Use of airspace management tools
- Harmonisation through interoperability, which has been achieved through the COOPANS and iTEC systems

Specific initiatives provided as best practices were:

- Top Sky
- SESAR
- COOPANS
- Maastricht UAC & ACCs within states
- LARA
- Full-OLDI
- NUAC
- EPN

Cross-border service provision or cross-border delegation of ANS

As with the establishment of joint control centres (see below), respondents agree that cross-border service provision or cross-border delegation of ANS has the potential to

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

generate substantial savings in resources, however a number of barriers exist, in the form of controller mobility and social/political pressures.

It was also pointed out that in several cases, cross-border service provision and/or cross-border delegation of ANS was already occurring prior to FABs. One ANSP noted that while ATS delegation existed well before FABs, new opportunities are currently being studied. A Ministry representative similarly stated that activities under the FAB represent a continuation of existing arrangements, whereas one NSA argued that cross-border service provision can be equally well performed outside of FABs, for example under bilateral arrangements.

Planned initiatives and example best practices were:

- Planned cross border operations between FIN and EST, FIN and NO, i.e. dynamic sectorisation
- DSNA & Skyguide around Geneva
- Confirmation of operational processes and procedures by DSOT
- BM Implementation Plan
- NUAC

Common CNS infrastructure developments

A concern is that the needs for CNS infrastructure are not necessarily dependant on geographical proximity, but rather on complexity. As with ATM systems, this is a key enabler of rationalisation yet is difficult to achieve as drivers for all states are so different and lifecycles are often defined by the system capabilities/ lifetimes, rather than willingness to jointly invest.

Planned initiatives and example best practices were:

- Maastricht UAC & ACCs within states
- SESAR-related initiatives
- Coordinated systems for the introduction of FRA
- Top Sky
- COOPANS
- Borealis

Joint procurement

ANSP, NSA and Ministry respondents stated that while joint procurement saves cost for the system/service, procurement rules are very different between countries. Consequently, effort often increases on the part of ANS staff because of the coordination required

Specific initiatives and best practices mentioned were:

- Maastricht UAC & ACCs within states
- NUAC
- EPN
- Establishment of a legal entity

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Joint training and training infrastructure of ANS personnel

A concern is that each state has a separate interpretation of training regulation and these are often conducted in native languages, so whilst lessons can be learned from best practices, harmonisation is difficult.

Specific initiatives and best practices mentioned were:

- FAB's competence schemes
- EUROCONTROL use of ENAC for initial training
- EUROCONTROL IANS & ACCs within states
- NUAC
- Entry Point North (EPN)
- Common position and compliance with EASA
- Common trainings of ATCOs
- Common core training and facilities

Coordinated AIS provision

One NSA respondent confirmed that free route airspace will enable a possible move to a common AIS process with common AIP.

Other comments concerning best practices were:

- eAID
- EAD
- SWIM and SES goals
- BM Implementation Plan

Joint maintenance

A concern is that separate systems means that maintenance personnel are specialised to work with particular systems, therefore joint maintenance makes sense only when identical systems are deployed.

Specific initiatives and best practices mentioned were:

- Coordination of engineering actions with DSOT
- Maastricht UAC & ACCs within States
- Top Sky
- NUAC
- COOPANS
- EPC

Coordination of ANSPs' investment plans

This measure is identified as an important pre-requisite for identifying common investment, although, as respondents pointed out, there are often confidential aspects to investment planning, which makes it difficult to engage FAB partners in the planning process. Another respondent (ANSP) noted that selection of investment projects depends on partners' experience, and not on measures which could potentially improve internal efficiency.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Specific initiatives and best practices mentioned were:

- Two non-FAB partners made a comparison and harmonised technical architecture
- Formal interfaces between ANSPs
- Performance plans
- INEA Call 2014

Convergence of supervisory structures involving NSAs, joint contingency arrangements

Specific suggestions and identified best practices were:

- Application of the same approach and oversight solutions
- Use of a pool of experts
- Regular knowledge and best practice sharing
- Common HR assessment
- Harmonised NSA Handbook

Synchronised life cycles of technical ATM systems

NSA, Ministry and ANSP respondents stated that synchronised life cycles of technical ATM systems is a key enabler of system rationalisation yet is difficult to achieve as drivers for all states are so different and lifecycles are often defined by the system capabilities/lifetimes, rather than willingness to jointly invest.

Example best practices were:

- FPL processing system upgrade
- COOPANS
- BM Implementation Plan
- NUAC
- EPN

Establishment of joint control centres whenever beneficial

As with the establishment of cross-border service provision or delegation of ANS, respondents agree that the establishment of joint control centres has the potential to generate large savings in resources, however barriers continue to exist in the form of controller mobility and social/political pressure

Specific initiatives and/or best practices mentioned were:

- The ability to introduced increased resilience in major failure conditions
- Reduction of ATCOs
- Maastricht UAC & ACCs within states

Rationalised capex which suitably addresses all developments needed for suitable ATM in the long term

Specific suggestions for best practices were:

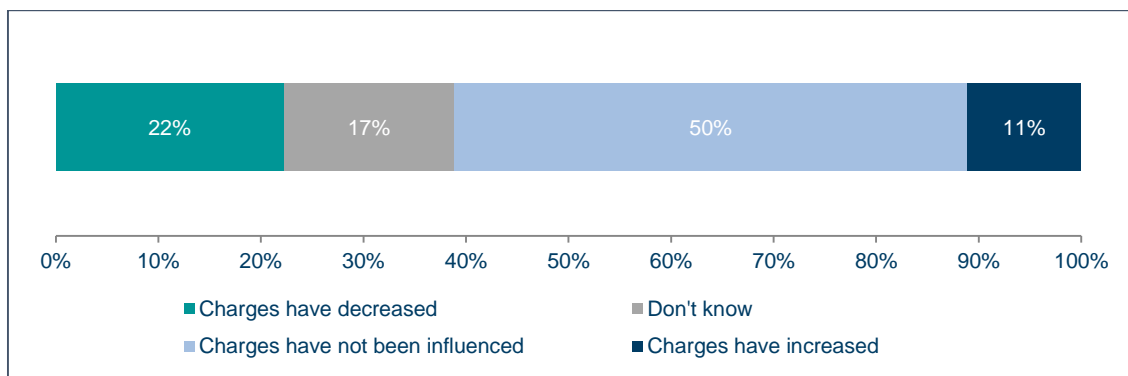
- Participation in SESAR Deployment Implementation
- Frequent CAPEX exercises

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

3.2.4.3 Impact on charges to airspace users

Respondents were asked whether FABs (and related implementation of the SES Performance and Charging Schemes) had the effect of increasing or decreasing the charges to airspace users. Figure 51 shows the distribution of responses.

Figure 51 FAB impact on charges to airspace users (N=54)



In terms of the balance of views, NSAs are relatively more positive than ANSPs regarding the view on impact to charges on airspace users, accounting for 31% and 15% of respondents indicating '*charges have decreased*', respectively. By contrast, ANSPs account for just over half of all respondents (52%) indicating that charges to airspace users have neither decreased nor increased as a result of FABs, compared to 31% of NSAs. Airspace users surveyed indicate that costs have increased since the creation of FABs, with the rest of the respondent groups being split.

The overall impression is that the FABs have had a marginally positive impact on the actual level of charges to airspace users. Just under a quarter of respondents (22%) indicate that charges to airspace users have decreased as a result of the FABs, while exactly half indicate that charges to airspace users have neither increased or decreased as a result of the FABs. Just 12% indicate a negative impact ('*charges to airspace users have increased as a result of FABs*').

When asked to provide an estimate of the order of magnitude of such changes, where relevant, respondents were either unwilling or unable to so. Respondents instead offered the following general observations:

- There has been an increase in the number of non-operational staff due to fragmentation, thus increasing costs
- The use of consultants to do the work increases costs
- The additional costs associated with FAB establishment and maintenance must go somewhere
- Many ANSPs are under pressure to decrease charges because of RP demands, which has come at the expense of less investment in equipment and humans

Factors identified as contributing to higher charges to airspace users were:

- Bureaucratic factors, including more meetings, travel costs
- Overhead costs of the FAB itself, without bring any tangible benefits
- Failed airspace projects that were fully developed but never implemented

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- Significant institutional coordination not aligned to benefit realisation
- Poorly managed change resulting in industrial actions impacting airspace users

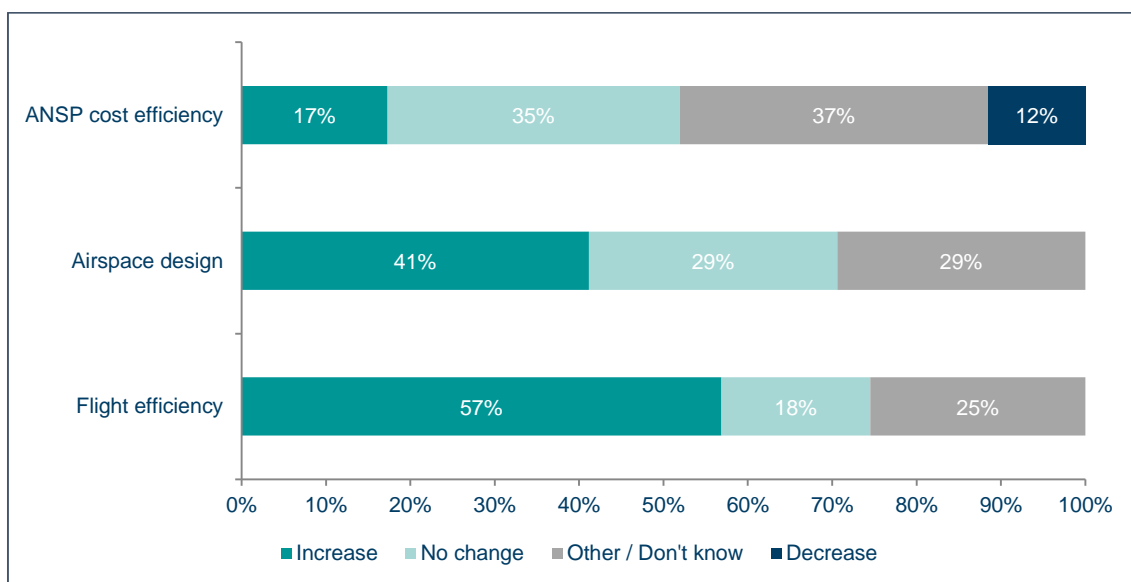
Factors identified as contributing to lower charges to airspace users were:

- RP 1 and RP2 performance targets and demands
- Cooperative initiatives of the individual FABs
- Resource efficiency measures

3.2.4.4 Single unit rate / common charging zone

Respondents were requested to indicate the expected impact of a single unit rate on flight efficiency, airspace design and ANSP cost efficiency, respectively. Overall respondents are most optimistic about the potential impacts in the area of flight efficiency, with a small majority (57%) expecting a common charging zone at FAB level, including a single unit rate, to have a positive impact on increasing flight efficiency, while just 18% expect no change to occur. Respondents are least optimistic regarding the potential impact in the area of ANSP cost efficiency, with only 17% expecting an increase. Moreover, ANSP cost efficiency is the only area where respondents expect a single unit rate / charging zone to have a negative impact, with 12% indicating 'Decrease ANSP cost efficiency'. Regarding airspace design, 41% expect an increase, while 29% expect no impact. Figure 52 shows the distribution of responses. Comments accompanying these responses are summarised below.

Figure 52 How would a common FAB-level charging zone (including single unit rate) affect the following areas? (N=52)



The distribution per stakeholder is rather balanced across the three areas. An issue is that the creation of FABs has not been accompanied by any technical modification of the route charges system. Concerning the advantages of the single unit rate at FAB level, one EU level respondent noted that the charging zones within a FAB would have to be merged first, which has not yet happened. This view was underpinned by the interviewed airspace users' representatives: it is a challenge that each state has a different unit rate

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

and because of that, operators may try and avoid airspace if there are large unit rate increases. An example of this is Germany, that increased its charge by 16% in 2015, which had a perverse effect on achieving environmental flight efficiency targets. Another interview with airspace users was more negative about the potential of common charging zones and single unit rates. That would not be supported in the near term, because it is not clear how cross-subsidisation can be avoided and how the internal costs of the FABs can be reduced. However, if it were to materialise, the unit rates should be reflective of the lowest costs in the FAB. In the survey was also stated that the single rate would not generate any tangible benefit on its own. Rather, the integration or merger of service providers should bring substantial benefits in terms of costs savings (e.g. economies of scale, elimination of duplicated effort, optimisation) and, consequently, in terms of impact on the cost base used by the charging mechanism. Finally, it was said that, depending on the level of integration or potential mergers of ANSPs within a FAB, a possible consequence may be the application of a single unit rate within this FAB. Additional comments were:

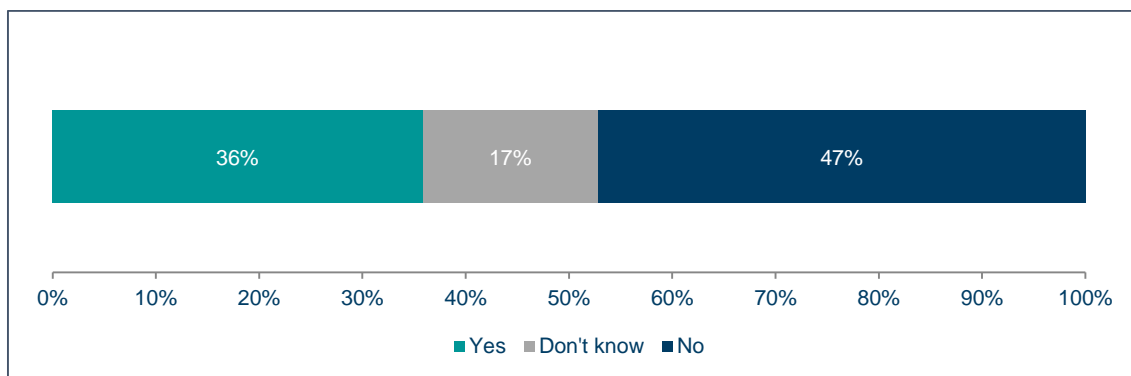
- A single unit rate should be applied at network level and not FAB level.
- A single rate would serve to the benefits of transparency with charges while failing to be cost reflective of specific FAB member services.

3.2.4.5 Investment policies

Under the Performance Regulation, Member States are required to report on actual capital expenditures investments carried out against the adopted performance plans starting in RP2. Some of these investments have been at FAB level.

Respondents were requested to indicate whether, based on their experience, FAB-level investments have been sufficiently coordinated. Overall, respondents offer a marginally positive view, with a little over a third (36% of respondents) indicating that coordination on investments at FAB level has been sufficient, however just under half (47% of respondents) disagree. Figure 53 shows the distribution of responses. Comments accompanying these responses are summarised below.

Figure 53 Is there sufficient coordination on investments at FAB level? (N=53)



**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The distribution per stakeholder group is again rather balanced, however with airspace users and the majority of trade associations indicating that investment at FAB level have not been sufficiently coordinated.

Examples of strong coordination structures and activities were provided:

According to NSA, ANSP and Military authority respondents from the same FAB, coordination on investments is ensured by the FAB's well-established and fully operational governing bodies and supporting expert committees (i.e. Governing Council, NSA Board and ANSP Board):

"The Governing Council provides oversight and approval of key FAB documentation (i.e. the DANUBE FAB Strategic Plan and Annual Plan, Safety Policy, Airspace Policy, Performance Plans, etc.). The NSA Board oversees the NSA supervisory activities. It is comprised of the heads of the NSAs of both Member States. Details of NSA cooperation are included in the NSA Agreement. The ANSP Board oversees implementation at ANSP level via the ANSP agreement. The Board is comprised of representatives from both ANSPs. Details of ANSP cooperation are included in the ANSP Agreement."

Additional examples of strong coordination structures and activities cited by different ANSPs were:

- The deployment programme indicates priority investments that can be coordinated on the FAB level, with regular information sharing activities on other investments;
- Common strategy, common business plan and ANSP plans are aligned with those;
- The FAB Business Plan gives a sufficient direction on FAB related activities. On the other hand, there's always room for improvement.
- COOPANS is the main system development.

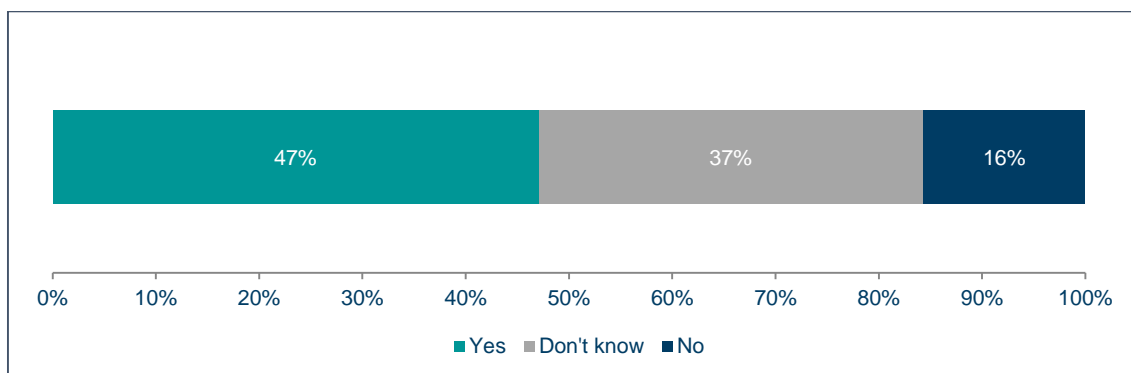
It is also mentioned that coordination depends very much on the FAB, or more specifically, on the ANSP and possible business opportunities. For example, an ANSP representative on behalf of one FAB stated that there are no common investments projects within the FAB, but rather all investment / business opportunities have been with ANSPs outside of the FAB. A workers' trade association further asserted that capex is the result of different needs and priorities. As such, FAB spending may not be appropriate, considering other industrial partnerships to which ANSPs may be a party.

Respondents were finally asked of their view concerning CEF funding. As shown in Figure 54, nearly half of respondents (47%) agree that CEF funding should give a strong priority to coordinated investment at FAB level. Just 16% disagree, with the remaining 37% indicating *'Don't know/No opinion'*.

In terms of the balance of views, ANSPs are strongly in favour of prioritising coordinated investment at FAB level, accounting for 65% of all positive responses. The remaining respondents are split between NSAs, Military authorities, Ministry and trade associations. On the other hand, NSAs are most represented in the category *'Don't know/No opinion'*, accounting for 42% of these responses, with the rest being split between the same categories as above, plus EU-level, ANSP, trade associations, and airspace users.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Figure 54 Should CEF funding give strong priority to coordinated investment at FAB level? (N=51)



3.2.5 Outcome of interviews

3.2.5.1 Airspace users

The airspace user representatives interviewed by the study team underscored that the existing FABs cannot be considered to meet the requirements of the SES legislation, especially as regards the expected optimisation of technical and human resources. Airspace users are also disappointed with the operational developments and benefits delivered by FABs.

The lack of political will is seen as a key impediment to FAB implementation. ANSPs and Member States have not implemented changes as they continue to stick to national approaches. For example, FAB performance are not joint plans but clearly done separately and added together at FAB level.

Some FABs are facing more pressure from the performance scheme, but the current economic regulation regime is not sufficient to enforce cost-efficiency improvements. The NSAs need to apply more pressure but they are too under-resourced to regulate the ANSP effectively. There is a need to reinforce the economic regulation regime and to apply stronger regulation at EU level.

Some efficiencies have emerged as a result of FABs: FRA, and also flight efficiency in reduced fuel burn from more direct routings. The interviewed airspace users expected to see more synergies.

According to airspace users, FABs do not have adequate processes for stakeholder consultation and user views are not properly taken into account in the FAB development. In addition, the lack of transparency of FABs is seen as a major issue; there is no reporting on the reasons explaining the limited progress.

Nevertheless, the airspace user representatives interviewed do not consider that the FAB concept should be abandoned for the time being. They see the problem with FABs arising not from a policy flaw, but from an inadequate implementation of regulatory requirements and a lack of enforcement.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

3.2.5.2 Trade unions

The interviewed trade union representatives conveyed that the social dialogue arrangements within FABs differ considerably depending on the FAB concerned. FABEC is reported to apply a good social dialogue model generating positive results. By contrast, a number of FABs either do not implement the FAB level social dialogue arrangements agreed at the outset of the FAB, or do not have any process at all for social dialogue. By and large, interviewees emphasised that staff involvement in FAB developments should be enhanced.

As regards views on FAB implementation in general, two of the interviewed trade union representatives considered the expectations set on FABs are perceived to be too high and unrealistic. The overall perception was that FABs have not been able to make a big difference so far and that changes could have also been achieved without them.

Trade union representatives expressed diverging views on the FAB concept in general. While they expressed scepticism about the possibility for FABs to deliver on high expectations in the short and medium term, the underlying idea of cross-border cooperation was seen as sound. One interviewee stressed that due to the difficult issues relating to national sovereignty and military aspects, FABs will need time to evolve towards the ideal vision. For this purpose, a pragmatic approach is required, which includes "letting the experts work without political pressure".

There was no strong support among trade union representatives to abandon the FAB concept altogether, but the need to enable other beneficial initiatives (such as ANSP industrial partnerships) to go ahead in parallel with FABs was highlighted.

3.2.5.3 Manufacturing industry

The aim of manufacturers is to provide the most advanced technology, implement SESAR Step 1, and incrementally deploy SESAR as quickly and widely as possible. There should be EU-wide solutions for technology.

The Manufacturing Industry sees the benefit of ANSPs grouping together to share development costs. Common specifications within FABs are a pre-requisite for joint procurement, which has been the practice for the new FDP system developments. There have been attempts to develop joint requirements for FAB level procurement. Changes in procurement practices in this respect may be forthcoming in the medium to long term. There could be cooperation among manufacturers and ANSPs on services, but to be conducted at the FAB level, rather than industrial partnerships, this would require common systems within FABs.

The industry is seeing more shared development and progress is accelerating within them. There are changes in ANSPs that rely on a common technology, but not at the FAB level. As of today no manufacturers have been awarded a contract at the FAB level. From a purely technology point of view, the FAB level is hence perceived as "absent" for the time being.

3.3 Key findings

3.3.1 Regulatory and institutional dimensions

3.3.1.1 FAB policy

- FABs were widely seen to have generated high administrative costs that are not fully offset by the operational and performance benefits, as a consequence of the lack of ambition to implement FABs and the absence of formalised shared accountability for FAB performance.
- Respondents considered that the initial establishment of FABs as political/state initiatives has not supported the delivery of FAB benefits.
- Respondents highlighted that a more performance and market based approach would be needed to drive change, and that the process should be operationally rather than politically driven.
- A frequently shared opinion was that the development of FABs should be built upon a “bottom-up” approach and partnerships. According to this view, a “top-down” approach forcing ANSPs to achieve reorganisation of airspace cannot be successful when entities find themselves to some extent in competition.
- Member States were seen by a large number of respondents and interviewed stakeholders as reluctant to enforce major changes in terms of FAB ANS provision. National sovereignty aspects and interests related to the control of national ANSPs were seen to limit the potential of FABs in terms of benefits to airspace users.

3.3.1.2 SES legal requirements vs. existing FABs

- Respondents considered that the current FABs are not consistent with the legal definition set out in the SES Framework Regulation (art. 2(25), EU Regulation 549/2004).
- From the respondents’ perspective, although FABs have adopted the legal instruments defining their formal establishment and functioning, there is a need for stronger political will to ensure changes in the organisation of ANS in FAB states. Airspace users underscored that the failure to implement FABs is not due to a flawed policy setting or to lack of regulatory clarity, but rather to inadequate implementation, a lack of political willingness and ambition.
- Respondents considered that existing FAB objectives and outcomes do not ensure appropriate FAB implementation. The broad regulatory direction given for FABs has, rather than leading to fundamental consolidation, led to FABs searching all possible areas of cooperation and pursuing diverse harmonisation projects which added value is not always demonstrated. A number of respondents stated that ANSPs should rather concentrate on specific business-driven projects which will bring tangible benefits.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

3.3.1.3 Legislative developments

- The respondents' opinion is that the SES legislation should enable flexible ANSP level cooperation. The SES 2+ proposal is mainly seen positively, as it supports the introduction of industrial partnerships, which would allow ANSPs to deliver technological step-change and performance improvements. However, regulatory changes as such were not seen as a silver bullet leading to enhanced FAB implementation.
- ANSPs expect to have more flexible approach to the FAB partnership, where the FAB is complemented by other initiatives defined by each state, as this may allow better mechanisms to deliver change outside of the FAB structure (competition/industrial partnerships/novel technologies etc.).

3.3.1.4 Institutional aspects

- From the respondents' perspective, ANSP level cooperation is seen as the most mature process within the FABs.
- The respondents' opinion is that institutional structures and governance are also a strong aspect of the FAB implementation. However, additional decision making layers introduced in some of the FABs were not seen to bring added value, and effective decision making within FABs remains a major issue according to several stakeholders.
- Airspace user representatives expressed the view that the FAB arrangements for stakeholder consultation are not adequate, and that user views are not properly taken into account in the FAB development.
- Based on the conducted survey and interviews, it appears that some FABs have not ensured adequate social dialogue.
- In addition to that, the survey results indicate that FABs have not overall ensured sufficient involvement of military stakeholders on FAB level.
- One of the FAB shortcomings raised by many respondents is the lack of optimisation of resource use both on ANSP and NSA level.

3.3.2 Technical and operational dimensions

- Respondents regarded FABs as having the highest potential in improved airspace configuration and management, and have made the most progress in this area. There was a difference in opinion as to whether the improvements are due to coordination from FABs or the Network Manager.
- Respondents also highlighted the continuing difficulties with cross border airspace optimisation due to military or other sovereignty concerns, although there was doubt from some as to whether the military really is the blocking factor. In regards to the flexible use of airspace, States and military respondents tend to view this as a national process, predating the SES.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- A general theme from respondents' comments was whether FAB projects could have been implemented without the FAB existing. I.e. is the FAB driving progress or has it become a grouping of national and regional projects that would have been done anyway.
- Airspace users do not feel they have been involved in any meaningful way in FAB developments, with little to no consultation or progress updates.
- FAB plans are generally seen as supporting performance improvements but criticisms were that they were either unrealistic or lacking ambition.
- FABs were not particularly seen as driving common technology or interoperability, with limiting factors seen mostly as financial or political.
- FABs were not seen as enhancing safety.

3.3.3 Economic and financial dimensions

- Regarding benefits to airspace users, respondents indicate that benefits have been higher in the area of flight efficiency, i.e. cost savings resulting from reduced fuel burn, compared to cost savings from reduced delays. Delays are said to be generated at the local level or caused by external factors, neither of which can be addressed by the FABs. At the same time, many FABs do not experience delays, therefore removing any potential impact.
- The main driver of benefits has been the implementation of cross-border airspace structures, in particular FRA and more direct routing. Many respondents contend that the FAB initiatives which contributed to the benefits that have materialised (i.e. from the implementation of FRA) would have been established regardless of the FABs regulation, however the FABs sped up the process of establishing the FRAs.
- The common charging zone has not been the focus of FABs, but rather FABs have focused on targeting improved service quality through the establishment of FRA.
- Costs have significantly outweighed benefits since the creation of FABs. At the same time, the majority of respondents offer a positive assessment of the future potential of the FABs, expecting that the initial investment will bring benefits going forward. The long-term potential for FABs to become the preferred vehicle to fulfil more challenging performance requirements will depend, however, on the ability of stakeholders to set such requirements in the future.

4. Benchmarking analysis

This chapter presents the results of the FAB benchmarking analysis, and highlights the identified best practices.

4.1 Benchmarking model

4.1.1 Objectives and principles

In accordance with the terms of reference of the study, the study team is tasked to appraise the progress made by FABs through a benchmarking analysis. Benchmarking is typically based on the principle of comparing and evaluating one or several entities against a comparator group of entities operating in the same field and regulatory environment.

In the context of this study, the purpose of the benchmarking analysis is to:

- appraise the maturity and effectiveness of FAB implementation;
- identify the FAB processes and success factors resulting in superior performance;
- highlight best practices.

The benchmarking aims to foster the implementation of FABs across the EU by helping to identify opportunities for improvements that could be implemented by FABs in the short and medium term.

The FAB benchmarking model is composed of 10 criteria against which each FAB is evaluated. The criteria, outlined in section 4.1.2 below, cover all the dimensions of FAB implementation: the institutional/regulatory dimension, the technical/operational dimension, and the economic/financial dimension.

These criteria were built upon those proposed by the Commission in the study's terms of reference. This includes some criteria agreed with Member States in the context of the Council discussions on SES II +. Hence, the working assumption given for the study was that the efficient use of technical and human resources in a functional airspace block could be achieved through, amongst other things, the following²⁴³:

- "joint training and training infrastructure of air navigation services personnel,
- synchronised life cycles of technical ATM systems,
- harmonised ATM systems and tools,
- rationalised capital expenditure which suitably addresses all developments needed for sustainable ATM in the long term,
- coordination of ANSPs' investment plans,
- establishment of joint control centres whenever beneficial,

²⁴³ Terms of reference for this study, to assess the organisational, operational and technical progress of FABs.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- common CNS infrastructure developments,
- cross-border service provision or cross-border delegation of ANS,
- coordinated AIS provision,
- convergence of supervisory structures involving NSAs, joint contingency arrangements.”

It is necessary to emphasise that our benchmarking analysis, like any similar exercise, is subject to caveats and limitations. These relate to the quality and comparability of data. For example, a possible comparability issue ensues from the fact that FABs have a varying number of participating countries – a FAB composed of two countries is not subject to the same constraints as a multi-State FAB. Similarly, FABs have very different operating environments in terms of airspace complexity, traffic flows etc.

The benchmarking model highlights the identified limitations in respect of comparability, but these have to be borne in mind when considering the benchmarking scores and results.

4.1.2 Criteria

The FAB benchmarking criteria were developed considering the applicable regulatory requirements, the policy expectations set on FABs, the review of FAB documentation and stakeholder views. Not all of the criteria are expected to be met to deliver an optimum FAB, as each FAB will have different circumstances and constraints. However, each FAB may be expected to address most of the criteria to some extent.

The benchmarking criteria are outlined below, with more detailed descriptions provided in the following subsections.

1. **FAB geographic and operational scale** – The FABs should be large enough to support economies of scale.
2. **The scope of FAB activities** – The broader the scope of activities, the greater the potential to deliver against the SES performance goals.
3. **FAB business planning and development** – The FAB business plan should demonstrate how the ambitions of the FAB will be achieved and updated annually.
4. **Optimised operations and consolidation** – The FABs should transition towards consolidated/integrated operations, including ATFCM, ASM.
5. **Technical harmonisation and rationalisation** – The FABs should apply an integrated approach to technical systems and the deployment of new technology.
6. **Network integration and support to network level operations** – The FABs should cooperate with the Network Manager, other FABs and third countries; with a view to maximising network benefits.
7. **FAB governance and customer engagement** – The decision making structures and processes at all FAB levels should enable the effective implementation of FAB objectives. FABs should demonstrate strong customer engagement and focus.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

8. **Management of the FAB social dimension** – The FABs should ensure a regular social dialogue regarding the FAB implementation.
9. **NSA level cooperation** – The NSA level cooperation and coordination within the FABs should ensure effective implementation of FAB objectives.
10. **Development of FAB common charging zone** – FABs should develop common charging zones that deliver operational and/or environmental improvements.

4.1.3 Assessment

4.1.3.1 Principles

The study has defined qualitative or semi-quantitative measurements for each criterion. FABs have been benchmarked against each other and a set of best practices developed from the study terms of reference. The study has assessed for each FAB to what extent the criteria have been met.

It should be emphasised that the assessment against best practices is based on the expert judgment of the study team against the information provided by FABs. This information is summarised in Chapter 2 and has been compiled from a wide variety of source information, including queries on project status made to FABs during the study.

There are differences in the benchmarking assessment method applied to different criteria, reflecting the nature of the criteria and the quality of the supporting information available. The overall assessment scale is presented in Table 12 contained in the sub-section 4.1.3.2 below. The specific characteristics related to the assessment of the operational and technical criteria are explained in section 4.1.3.3.

4.1.3.2 Assessment scale

The outcome of the benchmarking assessment for each criterion is presented in a standardised manner in accordance with the three-tier scale outlined in Table 12 below.

Each FAB gets a score on a scale from 1 to 3 points (visually shown in the form of circles) based on the result of the benchmarking analysis.

Accordingly, where notable inadequacies have been identified in respect of a specific criterion, the benchmarking outcome for the FAB results in one point²⁴⁴. Satisfactory implementation corresponds to two points, while the best-performing FABs (applying solutions identified as best practice in the domain concerned) get three points.

Furthermore, to facilitate the readability of the report, the benchmarking outcome for each criterion is shown on maps (produced with the Eurocontrol SAAM tool²⁴⁵) covering all FABs, through the colour coding specified in Table 12.

²⁴⁴ Although, as mentioned previously, there may be good reasons for a FAB not meeting the criteria and pursuing other avenues for performance improvement such as industrial partnerships.

²⁴⁵ The maps displaying the benchmarking results have been produced by the study team, using the EUROCONTROL System for air traffic Assignment and Analysis at a Macroscopic Level (SAAM), Copyright (C) EUROCONTROL 1995-2014. The permission for use was formally obtained from EUROCONTROL via the Network Manager.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Table 12 Three-tier scale (presentation of benchmarking results/scores)

Benchmarking assessment result	Score	Illustration colour on map
Notable shortcomings – high potential for improvement	●	Orange
Potential for improvement through the implementation of relevant best practices	●●	Yellow
Identified best practice – best-performing FAB(s) in the examined domain	●●●	Green

4.1.3.3 Specifics relating to operational and technical benchmarking criteria

As regards the benchmarking criteria related to the operational/technical projects and their planning, the study team have used a 5-point scale as outlined in Table 13. This is different to the approach to economic and regulatory criteria, based on a 3-point scale, but is required to differentiate better between the information on progress provided by FABs.

Table 13 Specific scale for benchmarking operational / technical criteria

Scale	Score
Clearly demonstrated in practice in the FAB	1
Substantially but not completely demonstrated	0.75
Some evidence of this being demonstrated	0.5
Some very limited evidence of this	0.25
No evidence of this being demonstrated	0

For the sake of consistency and comparability, the results of the benchmarking assessment for operational/technical criteria are also converted into scores corresponding to the standard three-tier scale outlined in Table 12 under the previous sub-section.

4.1.4 Best practices

The study has also identified a number of best practices that are linked to the criteria. These best practices have been drawn from several sources: actions that one or more FABs are already doing or plan to do (as highlighted above), the terms of reference for the study, consultation responses, and expert judgment of the study team.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

As with the criteria, the best practices are not all expected to be implemented for an optimal FAB, as a best practice for one FAB may not be feasible, sensible or cost effective for another. Some of the best practices have been exposed to ANSPs and NSAs at the FAB study workshop held on 29 November 2016. This enabled some informal validation and the set of presented best practices has not been altered for this report. However, it may be valuable to refine and use these best practices for future FAB assessment work; with the close involvement of FABs so that feasibility issues can be raised.

The best practices are described under each criterion in the remainder of this chapter. They have been used to benchmark FAB progress by comparing actions taken by FABs against the benchmarks under each criteria.

4.2 FAB geographic and operational scale

4.2.1 Definition of benchmarking criterion

The first benchmarking criterion addresses the geographic and operational scale of the FABs, where the FAB should be large enough to support economies of scale. FABs with larger geographic scope are likely to make more progress than smaller FABs in the long term, although this is subject to effective governance arrangements. Regulation 549/2004 states in article 2 (25): *'functional airspace block' means an airspace block based on operational requirements and established regardless of State boundaries, where the provision of air navigation services and related functions are performance-driven and optimised with a view to introducing, in each functional airspace block, enhanced cooperation among air navigation service providers or, where appropriate, an integrated provider*".

The referenced article refers to the fact that FABs should be established regardless of State boundaries. From the current FABs in place, it is known that for all FABs State boundaries have been taken fully into account, so from this perspective all FABs would score equally poorly on this aspect. However, if we would only look at this element, the aspect of operational scale would be disregarded. The FABs should be large enough to support economies of scale. In a two-state FAB this potential is generally smaller than in a multi-State FAB, but this is also dependent on for example the airspace volume. The article of Regulation 549 as quoted above, clearly references to enhanced cooperation with the aim to optimise performance. The benchmarking of operational and technical consolidation achievements of the FABs is carried out under criterion 7 and 8, while under criterion 4 aspects such as sector productivity improvements are addressed.

The benchmarking of operational and technical consolidation achievements of the FABs is carried out later in this section. Therefore, as a proxy for the potential to realise economies of scale we consider four elements:

- a. The total volume of airspace controlled, as a proxy for absolute size.
- b. The share of the FAB in the total EU ATM/CNS provision costs, as a proxy to indicate the potential contribution to improve EU ATM cost efficiency from economies of scale realised in the FAB. It should be noted that: (a) actual ATM /

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

CNS costs reductions might stem from non-FAB related measures taken by individual ANSPs; and (b) other factors are relevant such as terrain and legacy systems, which are discussed in section 4.7.

- c. Total airspace coherence suitable to accommodate traffic flows. This aspect aims to cover whether there is a relatively large or small common border of the constituent states and whether there are gaps in the controlled airspace that prevent effectively accommodating traffic flows by the FAB.
- d. Number of participating States. More states indicate greater potential for scale economies.

4.2.2 Relevant legal provisions

Regulation 549/2004, article 2 (25), as stated above.

4.2.3 Benchmarking

In the table below, the indicators for the three elements as addressed are presented. In the table the benchmarking 'score' represents a possible envelope for what might be achieved, before other factors are taken into account (terrain, legacy systems, political support etc.)

Table 14 Benchmarking table: FAB geographic scope and operational scale

	KM2 ²⁴⁶ controlled airspace (M)	% of EU ATM/CNS costs ²⁴⁷	Common border	Participating states	Score
Baltic FAB	0,4	3%	Small	2	●
BLUE MED FAB	1,7	12%	Large	4	●●●●
DANUBE FAB	0,4	3%	Small	2	●
DK-SE FAB	0,8	4%	Small	2	●
FAB CE	0,4	8%	Large	7	●●
FABEC	1,8	42%	Large	6	●●●●
NEFAB	1,3	4%	Small	4	●
South West FAB	2,9	12%	Medium	2	●●
UK-Ireland FAB	1,4	12%	Medium	2	●●
	11,0	100%			

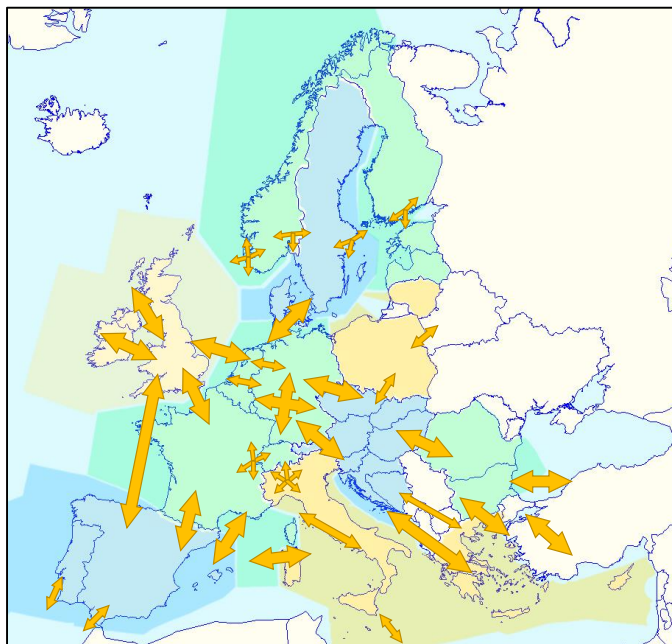
²⁴⁶ Source: ACE Benchmarking report 2011 (published in April 2013)

²⁴⁷ Source: ACE Benchmarking report 2014 (published in March 2016)

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Figure 55 provides further insight into the traffic flows between States; not shown are internal flows, which are quite substantial in many of the core European States. Several of the FABs have substantial traffic flows between the composite States (UK-IRL, FABEC, FABCE, BLUE MED, DANUBE) but others are at the periphery of the main traffic flows and have limited flows between them (SWFAB, BALTIC and NEFAB). The implication is that the latter group will have limited scope for FAB impact on airspace or route efficiency. For example, Spain has much greater

Figure 55 Traffic flows



interaction with France than Portugal, hence the rationale for the current SWFAB-FABEC cooperation. The importance of flows between the Western Balkan States and surrounding FABs (FABCE, DANUBE and BLUMED) can also be seen in the figure.

The Baltic FAB, constituting two States, is relatively small in terms of controlled airspace. Subsequently, the share of their costs in the total EU ATM/CNS provision costs is also small, which leaves limited opportunity for economies of scale. Finally, there is a short common border between the 2 states with Kaliningrad of the Russian Federation in between.

The BLUE MED FAB is a relatively large FAB, in terms of airspace controlled. The share of the BLUE MED FAB costs in total ATM/CNS costs is also significant, which provides in principle potential to realise economies of scale. Also there is a significant common border between two of the four the participating States.

The Danube FAB, with only 2 states participating, is relatively small in terms of controlled airspace. This means that also their potential to realise economies of scale in terms of ATM/CNS cost reduction is small. There is a relatively small common border between the states.

The Danish Swedish FAB has a below average controlled airspace area, and a small contribution to the total ATM/CNS cost base, which means that the potential to generate economies of scale is not so large. There is a relatively small common border but strong traffic flows between the States.

FAB CE is with seven participating states relatively small in terms of controlled airspace. The seven states take up an 8% share of the total EU ATM/CNS costs. There is also a relatively large common border between the states..

FABEC is a large FAB with a significant area of controlled airspace and taking up 42% of the total provision costs, indicating large potential for scale economies. The common

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

border of participating states is also relatively large and there are substantial and complex traffic flows within and between States.

NEFAB is in terms of area relatively larger, but in terms of provision costs relatively small. Whilst it constitutes four States it has a small common border, with the DK-SE FAB in the middle of it and limited traffic flows between States.

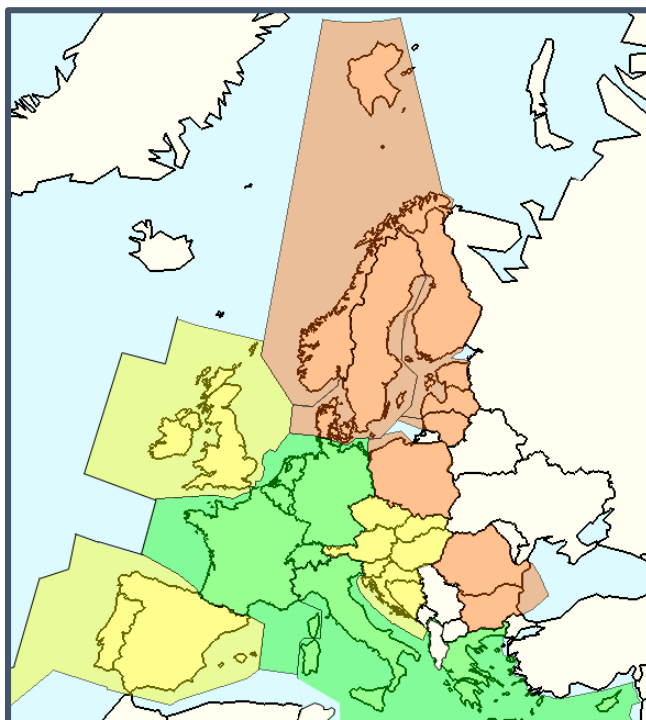
The SW FAB is also one of the larger FABs in terms of airspace controlled and with a significant share in the total ATM/CNS provision costs. There is a medium size common border between the 2 states but limited traffic flows between Spain and Portugal. Altogether this points to a low potential for scale economies.

Finally, the UK Ireland FAB is in terms of controlled airspace and contribution to ATM/CNS provision costs tending to the average. The 2 states have a medium size common border. Altogether there is a relatively medium potential of economies of scale.

4.2.4 Overview of results

The map below displays the overall results of the benchmarking analysis for the "FAB geographic and operational scale" criterion.

Figure 56 FAB geographic and operational scale - Overview of benchmarking results per FAB



4.2.5 Best practices

Under this criterion, the FABs have been scored on their potential to generate economies of scale due to their geographical and operational scale. This potential stems from different factors as we have discussed above. Large potential is indicated if there are multiple states in a FAB, with a relatively large share in the total ATM/CNS costs of the EU and a relatively large airspace controlled. As a result, the BLUEMED FAB and FABEC

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

score well in terms of potential. Under this criterion, we have not assessed to which extent this potential could be realised.

4.2.6 Recommendations

The premise of this criterion is that more efficiency can be gained through larger FABs, but there are complicating factors. Those FABs with limited traffic flows between States will not necessarily create much greater operational efficiency by grouping together, as there will remain limited flows between States. Traffic flows are dominated from the core area of Europe and between this and other regions, (North Atlantic and Middle East regions in particular). In this respect the most significant FAB is FABEC, but this also serves to limit the opportunities for surrounding FABs. This may be the optimum solution, so FABs with significant flows with FABEC need to focus on inter-FAB projects, which is being seen to be done with UK-IRL and SW FAB. A further factor is that ATM systems are now being seen to develop through industrial partnerships, for reasons that will be discussed in section 4.7.

Given these issues, our recommendation is for the Network Manager to look at possible options for FABs at the periphery of Europe, in terms of future network efficiency. We note that there was little enthusiasm from the Stakeholder Workshop²⁴⁸ to combine FABs, but such a study may at least inform this position and potential findings could be taken forward through inter-FAB cooperation.

4.3 Scope of FAB activities

4.3.1 Definition of benchmarking criterion

The study team views that the broader the scope of FAB activities, the greater the potential to deliver against the SES performance goals. Supporting this view, we note the following:

- Air traffic control is an end to end service - focusing on en route only addresses part of the total cost / service quality equation which starts at the departure from or arrival at the gate.
- TMA and En route services are typically delivered from a single Air Traffic Control Centre (ACC). Thus any rationalisation/harmonisation or any other change in en route service provision will also impact TMA.

The intended scope of activities in a functional airspace block is informed by the regulations. Regulations (EC) 549/2004 (the Framework Regulation) and 550/2004 (the Service Provision Regulation) set the general expectation that a FAB is defined for upper airspace and thus en route services, with no specific mention of TMA. Regulation (EC) 549/2004 defines 'functional airspace block' as being based on operational requirements regardless of State boundaries, performance-driven and effecting enhanced cooperation among ANSPs, even towards an integrated provider of ANS. Regulation 390/2013

²⁴⁸ Internal Stakeholder FAB workshop 29 November 2016.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

requires performance plans at FAB level, which further requires performance to be considered based on a gate-to-gate approach, including en route and terminal ANS.

From the materials examined in this study, some FABs include terminal or airport related projects. Where they do, these projects seem to be airport or route specific projects within the FAB rather than genuinely FAB wide projects, although this is consistent with the RP2 Performance scheme, which expands the capacity and cost efficiency targets to include approach and airport operations. There are also likely to be FAB synergies with ancillary services such as AIS and meteorological services. Hence the study team opinion is that the scope of FABs should be wide so as not to miss opportunities, even if such opportunities are best implemented through other vehicles such as industrial partnerships.

For the study we have defined the scope as:

- All airspace within the FAB
- Supporting infrastructure (ATM/CNS)
- Ancillary services such as AIS, MET, FIS etc.

Because the baseline scope is for en route ATS (upper airspace), the study's recommended best practice is the extension of the FAB scope to address other issues such as TMA, but only where the FAB is instrumental in improving operations. It is defined as projects to address all issues within the FAB beyond en route ATS which impact the overall performance of the FAB.

4.3.2 **Relevant legal provisions**

As outlined above, the scope of FAB activities is regulated by EU Regulation 549/2004 (article 2(25) setting out the FAB legal definition) and EU Regulation 550/2004 (article 9a spelling out the substantive criteria for FABs).

These regulations do not set out any limitations as regards the scope of FABs (in terms of geographic scope or services) but do not explicitly require FABs to cover services other than air traffic services which are subject to designation requirements²⁴⁹.

It is however necessary to note that article 9a(1) of EU Regulation 550/2004 requires Member States to "cooperate to the fullest extent possible with each other" in order to comply with FAB related obligations, which conveys that FABs should aim to maximise the scope of their cooperation whenever beneficial.

4.3.3 **Benchmarking**

The study team opinion is that FABs should not limit themselves to the upper airspace as there could be FAB-level synergies in lower / terminal airspace. To be more specific, the study team has attempted to benchmark against the following elements:

- All airspace within the FAB

²⁴⁹ We are referring here to article 8(5) of Regulation 550/2004 which stipulates that the Member States within FABs shall jointly designate the air traffic service providers operating within the covered airspace.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- Supporting infrastructure (ATM/CNS)
- Ancillary services such as AIS, MET, FIS etc.

The study has found that there are a few FAB-level projects that include either TMA airspace or CNS services. These are summarised below but it should be borne in mind that there has been no obligation on FABs to have a particular scope and that there are other ways of delivering enhancements including industrial partnerships and inter-FAB projects. Hence there is no 'score' for this benchmark.

Table 15 Appraisal of FAB scope

	All airspace including TMA	FAB level ATM/CNS	FAB level ancillary services
BALTIC		Planned by 2021	
BLUE MED			
DANUBE		SUR - 1 radar	
DK-SE		Radar data sharing	
FABCE			
FABEC	Several national or bilateral projects - no FAB service delivery	SUR - 4 radar	
NEFAB		Radar data sharing	MET
SW			
UK-IRL	TMA not included in scope but has been included in intra-FAB and inter-FAB projects.	Datalink	AIS/MET under investigation

4.3.4 Recommendations

In respect of performance planning, the gate-to-gate approach recognises the inter-relationship between ANS services in terms of impact on performance of the total system (particularly delay, cost efficiency and safety). To the extent that gate-to-gate problems may be addressed at the FAB level, such as extended arrivals management, it is recommended that FABs include all airspace, bringing TMA and aerodrome operations and infrastructure into their scope.

4.4 FAB business planning and development

4.4.1 Definition of benchmarking criterion

It is established best practice for any organisation to do its business planning on a strategic and annual basis and this is encapsulated for ANSPs in the Common Requirements Regulation (EC) 1035/2011. Whilst there is no explicit regulatory requirement for a FAB business plan, the study considers this a natural extension of

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

ANSPs' business plans. It is also likely to be difficult to have clarity over national plans and consistency between ANSP and FAB planning, without a FAB business plan.

Best practices defined by the study

The study has identified the following items to be regarded as best practices in the FAB business planning domain and which are used as parameters of the benchmarking analysis:

1. Strategic objective - Demonstrate a strategic objective, milestones and measurable targets to show progress towards meeting the strategic objectives over time.
2. Integrated plan - The FAB plan should be an integrated FAB plan, rather than a summation of individual ANSP plans. The best practice will demonstrate a single FAB focused plan referencing individual ANSP contributions and tracking of implementation. Individual ANSP business plans should reference, deliver and be built in the context of the FAB plan. Currently it appears the other way around. Other features of a FAB plan should be: defined deliverables with assumptions, risks and contingencies; timeframes and resources identified, responsibilities allocated; progress against the plan reported and subject to scrutiny at FAB level. It should be updated annually.
3. Performance objective - Show how SES performance and other strategic objectives are being delivered through short term targets that are measurable. These would include but not be confined to the Performance Scheme targets.
4. Productivity objectives - Show how the strategic and performance objectives will be supported through productivity actions which optimise use of resources across the range of FAB services and associated support functions.
5. Sector productivity - Demonstrate how sector productivity will be improved in the combined FAB airspace based on operational scenarios that leverage the FAB.
6. Includes financials – the plan includes full financials, including analysis of costs and revenues and assumptions.
7. Includes CBA - major investments and initiatives are supported with robust cost benefit analysis and consultation with airspace users, so that FAB level actions are only instigated where there is a positive case and user support.

4.4.2 Relevant legal provisions

As outlined above, there is no explicit legal obligation for FABs to develop and implement business plans. In the context of this study, FAB business plans are seen as a tool for ensuring effective overall FAB implementation in accordance with the FAB substantive requirements set out in article 9a of EU Regulation 550/2004.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

4.4.3 Benchmarking

Most FABs have some form of annual plan (and all have some form of Performance Plan prepared for RP2). Most plans are essentially a FAB project plan detailing a series of FAB projects rather than a business plan. These lack most of the features described as best practices, in spite of comprehensive business planning processes in some FABs (see FABEC in box 1 below). Comparing the material seen by the study team against the above best practices shows the following elements of best practice:

Table 16 FAB business planning and development: evidence per FAB

Best practices	BLUE		DANUBE	DK-SE	FABCE	FABEC	NEFAB	SWFAB	UK-IRL
	BALTIC	MED							
1. Strategic Objective		✓		✓			✓	✓	✓
2. Integrated Plan				✓		✓	✓	✓	✓
3. Performance Objective	✓		✓		✓	✓			
4. Productivity Objective									
5. Sector Productivity									
6. Includes Financing									
7. Includes CBA				✓		✓	✓		✓

I.e. most of the proposed best practices are missing from most FABs’ business plans. Nevertheless, at a stakeholder workshop²⁵⁰ there was general agreement on the best practices. This was discovered through an informal poll at the workshop, which asked how important were the proposed elements to successful FAB business planning. The results of this poll are shown in the following figure.

As an informal workshop poll we do not want to draw a strong significance from the distribution of responses. The low importance attached to sector productivity may reflect that FABs are not seen as drivers of sector productivity, which is also reflected in the operational benchmarking discussed later in this section. That general productivity was more widely recognised as important may reflect opportunities for the FAB to deliver other efficiencies.

²⁵⁰ Workshop for FAB Internal Stakeholders, 29 November 2016.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Figure 57 Internal Stakeholder views on important elements in business planning²⁵¹



Box 1 FABEC business planning

Whilst FABEC does not meet all of the proposed best practices, it has a comprehensive planning process, with the following elements: a 'Programme Plan' dated July 2016; FABEC ANSP Five-Year Work Plan 2015-2019; FABEC ANSP Strategic Agenda; FAB Performance Plan.

These plans are supported by well-defined project structures which include many elements of what may be found in a business plan. However, these plans are primarily project plans, albeit with a good level of maturity and detail. We consider them to be mature in that they assess the impact of projects on performance targets, have defined deliverables with timeframes and resources identified, risks assessed, responsibilities allocated and any FABEC costs budgeted. Any major investments are matters for individual States and CBAs are used to assess project impact as opposed to being part of business planning process.

A further aspect of the benchmarking is to judge how advanced FABs are with each best practice. To this end we have assessed the evidence available and scored each activity using the five-level assessment scale presented in section 4.1.3 in Table 13. Using this scale, the FAB progress against the suggested best practices are as in the following table. As previously noted, the scoring is the study team's judgement based on the information available. It should also be noted that an absence of a best practice does not imply that one is necessary, but serves as a check on whether the FAB should be looking at implementing a best practice.

Table 17 Comparison of FABs by scoring against business planning benchmarks

	BALTIC	BLUE MED	DANUBE	DK-SE	FABCE	FABEC	NEFAB	SWFAB	UK-IRL	Total
1. Strategic Objective				0.25			0.25	0.25	0.25	1.0
2. Integrated Plan				0.75		0.75	0.75	0.25	0.25	2.75
3. Performance Objective	0.50		0.50		0.50	0.50				2.0
4. Productivity Objectives										
5. Sector Productivity										
6. Includes Financing										
7. Includes CBA				0.50		0.50	0.50		0.50	2.0
Total	0.50		0.50	1.50	0.50	1.75	1.50	0.50	1.0	7.75

²⁵¹ 19 participants in the poll from an audience of ANSP and NSA representatives.

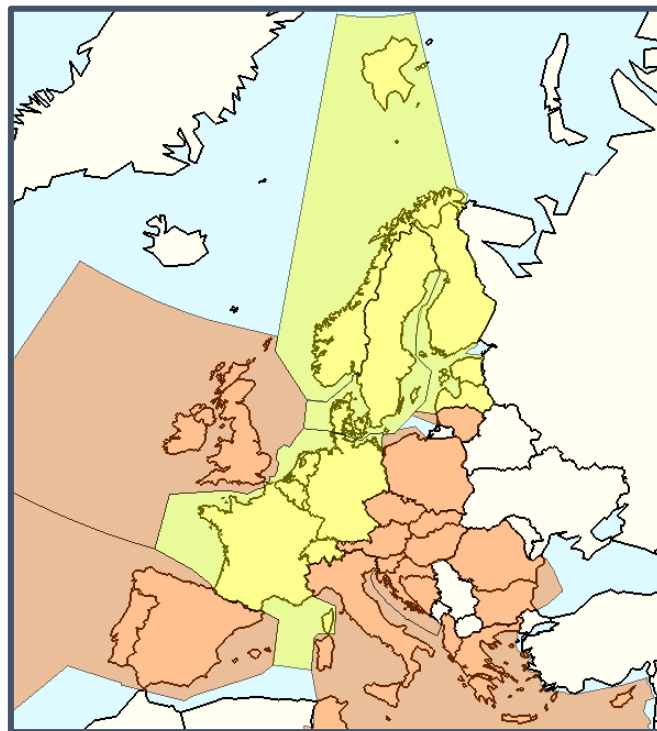
Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

4.4.4 Overview of results

To align the benchmarking with the other criteria, the table and map below display the overall results on a 3-point scale, where scores of <1.5 are regarded as having 'notable shortcomings', >1.5 as 'high potential for improvement' and > 3.5 as our threshold for 'best performing'.

FAB	Score
BALTIC	○
BLUE MED	○
DANUBE	○
DK-SE	○○
FABCE	○
FABEC	○○
NEFAB	○○
SW FAB	○
UK-IRL	○

Figure 58 FAB business planning and development - Overview of benchmarking results per FAB



4.4.5 Best practices

Of the identified best practices in section 4.4.1, those already implemented by FABs are:

1. Strategic Objective
2. Integrated Plan
3. Performance Objective
7. Includes CBA

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Whereas the following elements have not been included in FAB business plans:

4. Productivity Objective
5. Sector Productivity
6. Includes Financing

4.4.6 Recommendations

The majority of FAB plans are high level and conceptual as opposed to concrete business plans supported with a robust business case, detailed implementation plan, project financing etc. Without sufficient detail in its business planning it is not clear how the FAB can have confidence that the operational concepts defined will be delivered on. It would also appear to make it difficult for ANSP's individual business plans to incorporate the FAB dimension.

It is recommended that the FAB business plans should conform to all of the best practices, which could be realised through a FAB business plan template and guidance; although we expect that most ANSPs adequately meet these best practices for their own operations.

Improved FAB business plans would support better stakeholder consultation, providing stakeholders with a means to properly judge and influence FAB plans and progress on an annual basis. It would also facilitate the development and monitoring of FAB plans under the Performance Scheme. It is further recommended that FAB business plans are developed by the operational (ANSP) partners but in consultation with users, and approved by the States and the EC. These business plans could form the basis of FAB Performance Plans.

4.5 Optimised operations and consolidation

4.5.1 Definition of benchmarking criterion

The expectation on FABs set by the regulations and FAB plans themselves is predominantly an operational one, where an airspace block is "based on operational requirements and established regardless of State boundaries" (EC Reg 1070/2009). Regulation 550/2004 also requires air navigation services to be optimised so as to meet performance expectations. "Optimal performance" is not defined in the regulations but can be assumed to be performance which improves airspace efficiency, safety, cost effectiveness and environmental impact - consistently with the SES goals.

The study has identified the following elements as best practices, based on those provided by the EC in the study Terms of Reference:

1. Plans - FAB plans for individual operations include common FAB wide operational elements based on a common operational concept, airspace configuration and service delivery which is not constrained by national borders, integrated technology, share support services (training, MET, AIP) and procedures such as a single SMS and common contingency plan providing for full service continuity.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The plan should include clear targets with associated milestones. It should define the financial and people resources required to support the plan, as well as accountabilities and associated business financials.

2. ATM tools - are necessary to deliver optimised operations and support consolidation. These will primarily be the Pilot Common Projects and European ATM Master Plan (Level 3) initiatives. FABs should have a common and integrated approach to implementation of SESAR and European ATM Master Plan (Level 3), driven by delivery against a FAB operational concept (which in turn would be consistent with the European ATM Master Plan and the Network Development Plan).
3. ATFCM - optimisation of airspace efficiency and environmental impact requires optimisation of airspace design and management. The latter requires effective ATFCM coordinated with the Network Manager and neighbouring states. Effective FAB management of ATFCM and the relationship with the Network Manager may be expected to be organised based on a FAB-wide approach, as opposed to state by state.
4. FAB ASM - FAB-wide and /or cross border FUA and ASM, with extended FUA or Enhanced En route/TMA interfaces, are essential to optimisation of airspace efficiency.
5. Cross border sectorisation - FAB-wide sector configuration management i.e. sectors not constrained by State (FIR) boundaries.
6. Dynamic sectorisation - and dynamic [hour by hour] configuration of sectors to optimise service and costs regardless of state boundaries and the physical location of ATCOs.
7. Joint contingency - joint contingency arrangements with a view to reducing the cost of contingency provision and delivering full contingency, i.e. no or little degradation of service quality or availability and able to be sustained for weeks or months.
8. Optimise ACC infrastructure - rationalise the number of ACCs and supporting infrastructure and services.

4.5.2 Relevant legal provisions

Article 9a(2) of EU Regulation 550/2004 expressly requires FABs, inter alia, to:

- enable optimum use of airspace, taking into account air traffic flows;
- be justified by their overall added value, including optimal use of technical and human resources, on the basis of cost-benefit analyses.

In accordance with the FAB legal definition set out in article 2(25) of EU Regulation 549/2004, FABs are "based on operational requirements and established regardless of State boundaries". Furthermore, the provision of air navigation services and related functions within FABs is expected to be "performance-driven and optimised with a view

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

to introducing, in each functional airspace block, enhanced cooperation among air navigation service providers or, where appropriate, an integrated provider”.

4.5.3 Benchmarking

The following table shows projects that are implemented, under development and planned. The table distinguishes between projects that are being/have been implemented (I) and those that are under development (D) or planned (P). FABs have made progress in airspace design and ATM tools, but not in areas such as cross-border sectorisation and centre consolidation. This is less than may be have originally expected from the regulations, which required FABs to be defined without regard to State boundaries. Failure to view the combined FAB airspace as a single entity appears to remain a constraint to past and future progress.

Table 18 Optimised operations and consolidation: evidence per FAB

Best practices	BALTIC	BLUE MED	DANUBE	DK-SE	FABCE	FABEC	NEFAB	SWFAB	UK-IRL
1. Plans				P, I			I	P	D, I
2. ATM tools						I		I	I
3. ATFCM		D			P				I
4. FAB ASM	P, I	I	D, I	I	I	P, I	I	I	I
5. Cross Border Sectorisation	P		I		I		P		
6. Dynamic Sectorisation									D
7. Joint Contingency							P		
8. Optimise ACC infrastructure							P		D*

*UK-IRL has investigated optimisation of ACCs but no plans to take further.

Based on the evidence available, we have assessed how advanced FABs are, compared to other FABs, with each best practice. We have scored each activity using a five-level assessment scale presented in section 4.1.3 (Table 13) and reproduced below.

Scale	Score
Clearly demonstrated in practice in the FAB	1
Substantially but not completely demonstrated	0.75
Some evidence of this being demonstrated	0.5
Some very limited evidence of this	0.25
No evidence of this being demonstrated	0

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Table 19 Comparison of FABs by scoring against optimised operations benchmarks

	BALTIC	BLUE MED	DANUBE	DK-SE	FABCE	FABEC	NEFAB	SWFAB	UK-IRL	Total
1. Plans				0.75			0.50	0.50	0.50	2.25
2. ATM tools						0.75		0.25	0.75	1.75
3. ATFCM		0.25			0.50				1.0	1.75
4. FAB ASM	1.0	1.0	0.75	1.0	1.0	1.0	0.25	0.25	0.75	7.0
5. Cross Border Sectorisation	0.25		0.25		0.25		0.50			1.25
6. Dynamic Sectorisation									0.25	0.25
7. Joint Contingency							0.50			0.50
8. Optimise ACC infrastructure							0.50		0.25	0.75
Total	1.25	1.25	1	1.75	1.75	1.75	2.25	1	3.5	15.5

4.5.3.1 Detailed analysis

The following paragraphs consider the possible reasons behind the benchmarking results:

1. FAB plans

FAB’s operational plans tend to be a series of projects and there is limited evidence of harmonisation of investment planning for implementation of new operational concepts and technologies. Rather, this is pursued on a state by state basis. This will be in part due to the fact that operational planning and planning (and funding) of CAPEX is managed on a state basis. There is no comprehensive plan in any FAB for delivering on obligations under the PCP or European ATM Master Plan (Level 3) and there is no mechanism that successfully holds FABs accountable for their performance. I.e. stakeholder consultation and scrutiny tends to be undertaken on an ANSP basis rather than a FAB basis. Consequently, the FAB performance plans/targets are little more than amalgams of individual ANSP plans/targets. Together this means limited transparency and monitoring of FABs, limited accountability and no need for FAB plans. Accordingly those plans that do exist, with some exceptions, tend to be high level.

2. ATM tools

ATM tools, in the form of technical capability and operational procedures, provide the means to deliver optimised Air Traffic Services - as defined in the European ATM Master Plan. Given the close proximity of ANSPs in Europe, and the seamless nature of the service, the availability of ATM tools is contingent on all states having the same tools. The PCP and European ATM Master Plan (Level 3) are the mechanisms used to specify requirements and implementation schedules.

FAB structures do not appear to be adapted towards an integrated development vehicle, even where shared requirements have to be met for compliance at European level. ATM tools to improve traffic management throughout the FAB, such as extended arrival management, are mostly on a State or individual airport basis as opposed to a FAB basis. These appear to be predominantly locally driven projects, with some catalysed by SESAR. The exception has been Free Route Airspace (FRA), but even with this there are variations in the form and timing of FRA with a single FAB.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

3. ATFCM

Optimisation of airspace efficiency and reduction of environmental impact requires optimisation of airspace design and management.

ATFCM is coordinated with the Network Manager. At FAB level ATFCM is not currently regarded as adding value in terms of optimisation of airspace management given ATFCM requires a whole of network perspective and approach.

Effective FAB management of ATFCM and relationship with the Network Manager could be expected to be organised based on a FAB-wide approach, as opposed to state by state. This is how the Network Manager Regulation organises representation of states on the Network Management Board. The reality, however, is that most interaction with the Network Manager continues to be at individual ANSP level.

One of the key factors impacting airspace efficiency remains restricted airspace. Some intra-FAB initiatives have been implemented, for example in the Danube FAB. However, there continues to be substantial work to be done at a state-level to realise available efficiencies.

4. FAB ASM

Flexible Use of Airspace (FUA), optimised En route/TMA interfaces and adoption of FRA are key elements of Airspace Management (ASM) which can drive improved airspace efficiency across the European airspace network.

Progress with FUA at both state and FAB is constrained by the reluctant engagement of the military, who have other priorities to the FAB, and can be a significant impediment to progress.

TMA interfaces are issues primarily for major airports. TMAs do not feature strongly in FAB planning and could be regarded as out of scope. The issue is the location of the service means there is typically no operational interface with another ANSP, beyond the work of FABEC on flow between major hubs. Hence TMA is seen as a matter for an individual ANSP rather than a FAB. Thus, FABEC aside, the FAB is rarely used to address TMA ASM issues.

A major influence on routing has been the Free Route Airspace pilot common project (Commission Implementing Regulation 716/2014), which has not necessarily been FAB driven. In many cases the implementation has been on a bi-lateral basis. In some States this has been developed through the Borealis industrial partnership and in others FRA has been developed in States individually, which may not lead to a complete network optimisation. That FRA is not a FAB initiative is evidenced in almost all cases by States within the one FAB having different implementation timelines, airspace classifications etc.

5. Cross border sectorisation

Cross border sectorisation involves the formation of ATC sectors spanning and without regard to national borders, to optimise air traffic flow (primarily manage the en route / TMA interface for airports in close geographic proximity to national borders) or optimise

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

the organisation of ATC service delivery (for example creating a single combined sector in off peak hours rather than maintaining two sectors with one in each state). Cross border sectorisation is a pre-requisite for optimising sector configuration, routing and the cost-effective delivery of service.

The most obvious example of cross border sectors is the MUAC airspace. Beyond this, there has been some very limited cross border arrangements in place prior to FABs, although the motivation has been to remove the need for excessive coordination where routing is near the border.

The true value to be unlocked from cross border sectors is to open routing not otherwise available or to optimise the configuration of resources between ATC centres. The DANUBE FAB cross border area is small but does prove wider scale cross border sectorisation and operations are feasible. However, beyond this, cross border areas do not feature in FAB actions to date. Among the issues limiting ambition in this area are: the political issues of delegating control, social issues dealing with perceptions of loss of positions, military considerations, and lack of a strong incentive to take action to rationalise; as achieving cost efficiency targets appears to be possible without fundamental reform of the current service delivery model.

6. Dynamic sectorisation

Dynamic sectorisation is similar to cross border sectors, the difference being that sectors are established and dis-established based primarily on demand, but also factors such as staff availability, maintenance schedules, lowest cost of service delivery. Dynamic sectorisation does not feature in FAB initiatives beyond a Dynamic Sectorisation Operational Trial (DSOT) being undertaken by the UK/IRL FAB.

7. Joint contingency

Joint contingency, providing for full contingency (no derogation of service quality or availability and able to be sustained for weeks or months) is not in place as FABs lack the technical and operational capability to provide such a service. Thus whilst contingency features as a benefit of many FAB plans, it is not defined as full contingency and continues to be delivered on a State by State basis and on a restricted service basis. The development of the Virtual ACC concept may change this in future, although this may be more driven by common systems first and operational needs second.

8. Optimise ACC

Consolidation / optimisation of the number of ACCs, (buildings, technical and support infrastructure) in fewer, larger centres features in some FAB operational concepts but is not being actively pursued by any FAB.

Some argue that the cost benefit equation on consolidation has not been undertaken to establish the value of consolidation. However, within national borders, the consolidation that has occurred in Germany, UK and Ireland gives evidence of a positive business case. The business case will be more compelling where ACCs are managing comparatively low traffic volumes. Others point out consolidation of service provision requires harmonised

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

and even common systems, but the cost of replacing systems in the middle of the lifecycle would far outweigh any benefits.

4.5.3.2 **Factors constraining or enabling FAB operational progress**

From the consultations and more informal discussions during the study, the following factors that constrain or enable FAB operational progress have been identified:

- A potential loss of revenue in a state could slow or even block progress on route improvements. Route improvements coordinated by the network manager are at ACC level and lead to less concern about revenue impacts, potentially because the changes have effect downstream of an ACC's operating area and impact another state. By contrast, the FAB structure can lead to wider awareness, consultation and debate about the route benefits and revenue impacts, slowing or stalling route improvements. Allied to this, it is possible that the FAB decision making mechanisms are simply slow moving compared to ACC level projects, even those coordinated across multiple centres such as under Borealis.
- Revenue considerations may also be a reason for the limited progress on re-sectorisation around borders, as there are likely to be winners and losers in a re-designed airspace. Other factors at play are concerns about liability. Conversely, there may simply not be sufficient benefit to warrant such a re-sectorisation. Under the performance scheme, re-sectorisation may more likely be used to increase capacity with vertical sector splits, rather than applying wider changes for capacity and sector productivity reasons.
- Revenue considerations may also be a determinant of slow progress in FAB-level ATFCM. I.e. FABs may be reluctant to implement flow measures that transfer performance from one FAB partner to another. Network Manager Operations are a neutral party in this respect and may be the preferred arbiter of traffic routing decisions.
- Agreement is more easily reached on new concepts and related tools, such as those being developed under SESAR: XMAN, dynamic sectorisation. There are not necessarily winners and losers in such decision making and the implementation may not concern the whole FAB, reducing the number of parties involved.
- FABs also appear to make good progress when there is good civil-military coordination. UK-IRL and DANUBE FAB have made good progress in airspace management projects and this appears to be due to good relations and a common appreciation of benefits. In contrast, some FAB ASM progress has been blocked by reluctant engagement of the military, who may have other priorities to the FAB.
- There is no evidence of any business case to test FAB Operational Concepts including consolidation of centres, virtual centres or dynamic sectorisation. We note, however, that initial work on virtual centres is commencing in Switzerland, but not necessarily in the FABEC.
- These operational configurations which involve step change in how service is delivered are not being considered on any meaningful scale. There appears to be a

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

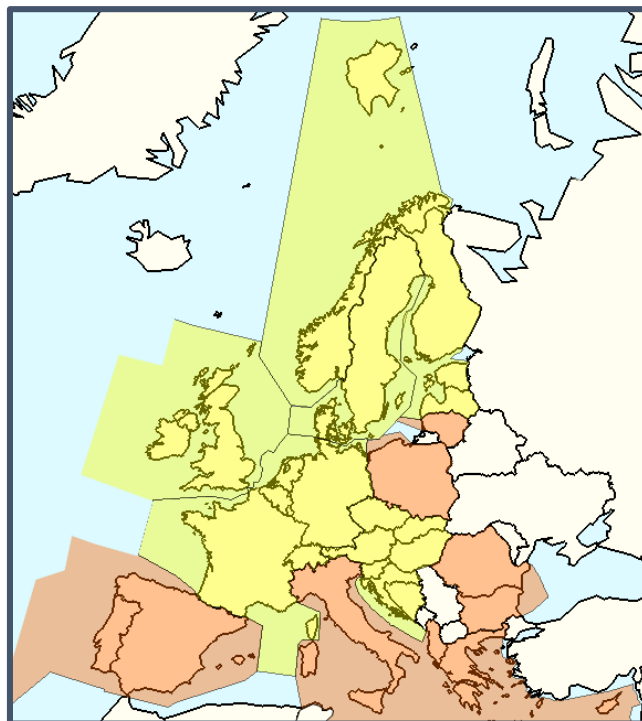
lack of political support that would see FABs consolidating operations into a fewer number of larger centres.

4.5.4 Overview of results

To align the benchmarking with the other criteria, the table and map below displays the overall results on a 3-point scale, where scores of <1.5 are regarded as having 'notable shortcomings', >1.5 as 'high potential for improvement' and > 4 as our threshold for 'best performing'.

FAB	Score
BALTIC	○
BLUE MED	○
DANUBE	○
DK-SE	○○
FABCE	○○
FABEC	○○
NEFAB	○○
SWFAB	○
UK-IRL	○○

Figure 59 Optimised operations and consolidation - Overview of benchmarking results per FAB



**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

4.5.5 **Best practices**

Of the identified best practices in section 4.5.1, those already implemented by FABs are:

1. Plans
2. ATM tools
3. ATFCM
4. FAB ASM
5. Cross Border Sectorisation

With the following mostly unaddressed:

6. Dynamic Sectorisation
7. Joint Contingency
8. Optimise ACC infrastructure

4.5.6 **Recommendations**

Our recommendations are as follows:

- The expectation for FABs to optimise operations should be focused on airspace and route development. Work in this area should also involve the input of the Network Manager to reduce any side effects caused by revenue considerations. Further work on common charging zones may reveal greater potential to improve both flight efficiency and traffic predictability, as well as finding ways around revenue disincentives. It is acknowledged that this is a complex area that requires further study.
- FABs should also seek opportunities to implement new SESAR concepts that improve terminal airspace flows, but this should not be limited to FABs and may be done on a bilateral basis within and between FABs.
- The longer term political goals of SES are unlikely to be achieved by airspace changes alone – they require fundamental changes in the configuration of operations to reduce the costs of service, which may only be achieved with strong political will at State-level. In the absence of such political will, alternative approaches to drive improved performance such as the industrial partnerships have emerged. These alliances need to be nurtured and facilitated so that FABs are not the sole path to rationalisation. FABs may play a role, but not as an end in themselves.

4.6 **Network integration and support to network level operations**

4.6.1 **Definition of benchmarking criterion**

This criterion is closely connected to the 'Optimised operations' criterion but focuses on the narrow point of FABs' interaction with the Network Manager, other FABs and third countries. In terms of airspace design, individual ANPS are already working effectively

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

with the Network Manager as evidenced in ARN Version-8²⁵², which included contributions from most FAB ACCs.

At a policy level the FAB represents its constituent ANSPs on the Network Management Board – thus it would be expected the FAB would be heavily involved in network issues. The implementation of FRA is defined under the Network Operating Plan and coordinated by the Network Manager. Thus, consistent with the Network Strategy Plan and Network Operations Plan, the FABs are expected to work with the Network Manager in implementing airspace and route design at a FAB and ANSP level. The Network Manager provides coordination as well as technical and operational support for local or sub-regional Free Route Airspace initiatives, which is used by ANSP to a greater or lesser extent.

This criterion also examines the co-operation between FABs (inter-FAB) and between FABs and other States (third countries). This criterion is important in that, for airspace projects such as FRA, the capacity to extend the concept into neighbouring states outside the EC area or to undertake projects with other FAB provides a potential to increase the operational benefits realised and obviate the limitations of those FAB which are bi-lateral arrangements.

Best practices defined by the study

The following elements have been identified as best practices and parameters for the benchmarking assessment:

1. Airspace improvements - FAB coordination with the Network Manager to implement the Network Operations Plan and the European Route Network Improvement Plan.
2. FAB level interface to Network Manager for ATFCM (sub-regional to regional ATFCM interface).
3. Inter-FAB cooperation arrangements in place.
4. Third country cooperation arrangements in place.

4.6.2 Relevant legal provisions

Article 9a(2)(c) requires FABs to “ensure consistency with the European route network” established through the network functions defined in the Airspace Regulation (art. 6, EU Regulation 550/2004).

Accordingly, Commission Regulation 677/2011 (Implementing Regulation on network functions) requires a strong interaction between the network functions and functional airspace blocks. Article 10(1) requires “...close cooperation and coordination between the functional airspace block and the Network Manager, such as in strategic planning level and tactical daily flow and capacity management”, whilst article 10(4) requires that

²⁵² Covering the period 2012-2014, this is the Air Traffic Services Route Network development plan, comprising a range of airspace improvement projects over a particular time as part of the European Route Network Improvement Plan.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

“Air navigation service providers cooperating in a functional airspace block shall ensure that consolidated views are formulated related to operational issues of the network functions”.

4.6.3 Benchmarking

The following table summarises the benchmarking under the network integration criterion:

Table 20 Network integration and support to network level operations: evidence per FAB

Best practices	BALTIC	BLUE MED	DANUBE	DK-SE	FABCE	FABEC	NEFAB	SW FAB	UK-IRL
1. Coordination with NM on airspace improvements	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. FAB level interface to NM for ATFCM									✓
3. Inter-FAB coordination		✓	✓	✓	✓	✓	✓	✓	✓
4. Coordination with 3rd countries		✓	✓				✓	✓	✓

A further aspect of the benchmarking is to judge how advanced FABs are with each best practice. To this end we have assessed the evidence available and scored each activity using the specific five-level assessment scale presented in section 4.1.3 (Table 13) reproduced below.

Scale	Score
Clearly demonstrated in practice in the FAB	1
Substantially but not completely demonstrated	0.75
Some evidence of this being demonstrated	0.5
Some very limited evidence of this	0.25
No evidence of this being demonstrated	0

Using this scale, the FAB progress against the suggested best practices are as in the following table. As previously noted, the scoring is the study team’s judgement based on the information available. It should also be noted that an absence of a best practice does not imply that one is necessary, but serves as a check on whether the FAB should be looking at implementing a best practice.

Table 21 Comparison of FABs by scoring against network integration benchmarks

	BALTIC	BLUE MED	DANUBE	DK-SE	FABCE	FABEC	NEFAB	SWFAB	UK-IRL	Total
1. Coordination with NM on airspace improvements	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	4.50
2. FAB level interface to NM for ATFCM									1.0	1.0
3. Inter-FAB coordination		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	8.0
4. Coordination with 3rd countries		1.0	1.0	NA		NA	1.0	1.0	0.50	4.50
Total	0.50	2.50	2.50	1.50	1.50	1.50	2.50	2.50	3.0	18.0

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The following paragraphs consider the possible reasons behind the benchmarking results:

Airspace

All ANSPs have been engaged with the Network Manager on either individual airspace projects and in particular on FRA. It is notable that 9 ANSPs, across several FABs have used the Borealis Alliance to provide a programme management input into FRA projects, coordinating ANSPs and liaising with the Network Manager. Borealis is a good example of the potential of industrial partnerships, which can work across multiple FABs.

There is clearly a need for FABs to work with the Network Manager across FAB or national boundaries; to effectively configure airspace and operational procedures to optimise performance at network level. FABs were conceived as a vehicle for regional coordination in addressing cross border sector and route design to improve network efficiency.

However, the reality appears to be that, at an operational level, the Network Manager is more likely to work with individual ACCs, as FABs do not often have a single point of contact and add additional process complexity. As already discussed in section 4.8, ASM and ATFCM projects may be delayed or even blocked by considerations of revenue redistribution among FAB partners. Hence the Network Manager's current working with ACCs appears to make more progress than FAB-driven efforts. The Network Manager also has the wider network picture, and should therefore be able to inform FABs on optimal outcomes.

FAB level interface to Network Manager

Only the UK-IRL FAB has consolidated its ATFCM. We understand that one of the constraints to FAB-wide ATFCM is that it has the potential to impact delay performance in other States, discouraging such cooperation.

Inter-FAB cooperation

In terms of inter-FAB arrangements, these take the form of participation in various forms of information sharing. They also take the form of joint participation on operational or technical projects where there is value in working together. An example of this is the task force between DSNA, ENAIRE and NAV Portugal, which is set to analyse long range direct routes through the airspace of Lisbon, Madrid and Brest ACC to best serve the Europe SW Axis.

The 'GateOne' cooperation agreement was established as a regional ANSP platform of Central and Eastern Europe with the aim to promote the efficiency of European ATM through an enhanced cooperation. It was signed by the 13 designated ANSPs of 3 existing FABs (Baltic FAB, DANUBE FAB and FAB CE) and 2 non-EU FIRs (Belgrade and Skopje). This was a response to the Letters of Formal Notice from the European Commission.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Third country cooperation arrangements

All FABs which share a common border with non-EU member states have some form of cooperation arrangement planned or in place for participation in FAB activities. These leverage existing operational arrangements / relationships which exist to manage transfers and other operational matters dealt with in Letters of Agreement. In terms of tangible benefits, most of the arrangements take the form of having an observer status or being consulted or involved on a project by project basis as appropriate. Some arrangements exist on a project by project basis for involvement of individual EU states in projects outside their FAB. For example, Hungary working with Danube FAB on FRA and Austria working with FABEC on Continuous Descent Approaches.

4.6.4 Overview of results

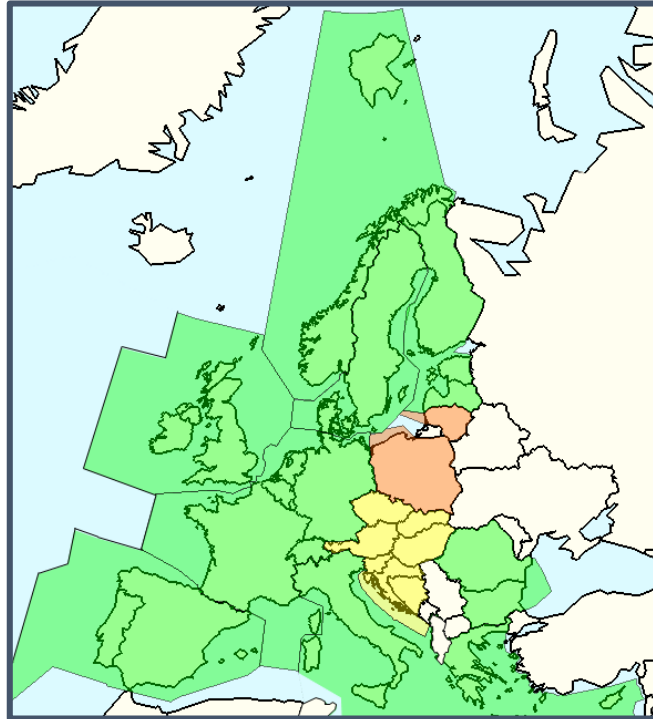
To align the benchmarking with the other criteria, the table and map below displays the overall results on a 3-point scale, where scores of <1 are regarded as having 'notable shortcomings', >1.5 as 'high potential for improvement' and >2 as our threshold for 'best performing'.

FAB	Score ²⁵³
BALTIC	●
BLUE MED	●●●
DANUBE	●●●
DK-SE	●●●
FABCE	●●
FABEC	●●●
NEFAB	●●●
SWFAB	●●●
UK-IRL	●●●

²⁵³ FABEC and DK-SE have been adjusted to ●●● as best practice 4 is not applicable.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

Figure 60 Network integration and support to network level operations - Overview of benchmarking results per FAB



4.6.5 **Best practices**

Of the identified best practices in section 4.6.1, those already implemented by FABs are:

1. Coordination with NM on airspace improvements
3. Inter-FAB coordination
4. Coordination with 3rd countries

With the following mostly unaddressed:

2. FAB level interface to NM for ATFCM

4.6.6 **Recommendations**

If FABs continue to focus on optimisation of airspace and route development, the nature and effectiveness of the interface with the Network Manager needs to be enhanced, becoming more operational and decisive. It is recommended this be examined to identify the current issues and improve working relationships.

Concerning relationships with third countries and other FABs, these should continue to be encouraged, so that FABs work with other States on projects to improve traffic flows.

4.7 Technical harmonisation and rationalisation

4.7.1 Definition of benchmarking criterion

There has been an expectation that FABs should apply an integrated approach to technical systems and the deployment of new technology. Initial FAB CBAs cited benefits in technical cooperation, from harmonising systems, joint procurement etc. The study has therefore defined the following 10 best practices based on those provided by the EC in the study Terms of Reference:

Best practices defined by the study

1. Harmonised systems - Defined as, e.g. common functionality, common HMI, capacity to seamlessly exchange data in appropriate format with other systems.
 - Harmonisation can be achieved at the system-to-system level where the industry and ANSPs are working together in industrial partnerships. Here the focus is on a system level, both hardware and application. As for example the COOPANS alliance (5 ANSPs), the iTEC alliance (5 ANSPs) and the Coflight/4-Flight alliance (3 ANSPs), and those ANSP alliances are closely integrated with the relevant technology providers: Thales, Indra and Thales/Selex ES (now Leonardo) respectively. If all ANSPs in the FAB initiative already use the same system platform then there are inherent interoperability benefits. If one or more ANSPs has to change their system to harmonise on a system level there will be substantial costs involved. Against this there are offsetting savings in procurement, systems modification, system acceptance testing, training etc.
 - Interoperability between different systems can also be achieved, regardless of system, at an operational level based on common operational procedures and systems functionalities – in particular the capacity to exchange data, an example being use of OLDI and FMTP for coordination and information sharing.

The benefits of a common system (as opposed to inter-operability) include:

- There are common specifications thus no requirement for a protracted and costly procurement process.
- There is incentive to minimise site specific customisation requirements which also drive costs.
- No need for individual Site Acceptance Testing.
- The single system provides the potential for full contingency which disparate HMI would otherwise compromise.
- Shared costs of development of new applications or compliance with regulatory requirements.
- For the smaller service provider, they can have a greater influence on the system development and design phase than they would otherwise have.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- There is potential to leverage the knowledge within the partnership group to have a better prediction in the systems further development.
 - Shared project management, training and other implementation costs
2. Synchronised life cycles - Synchronised life cycles of technical ATM system. In particular the FAB plans will include actions to harmonise investment cycles - to maximise procurement opportunities and create a common technology platform.

Synchronisation requires a level of cooperation between partners to:

- negotiate with the supplier over price and specification;
- a prioritising process for future system support and development;
- adapt systems which interface with the ATM system.

Unless the FAB partners elect to phase implementation with different ANSPs implementing at different times to eventually end up with a common system, synchronisation also requires bringing forward depreciation on the current system. It thus has a cost, although the cost may be recoverable as part of the determined unit costs.

3. Coordination for new technology deployment at FAB level - Actions to achieve coordination for the deployment of new technology are defined in the Network Plan, PCP or in European ATM Master Plan (Level 3). These are typically time bound, requiring ANSPs to implement defined technology elements, or more typically operational concepts which are supported by technology elements, by a set date. There is an opportunity for ANSPs in a FAB to coordinate the implementation to realise procurement benefits, share costs of procedures development and training etc., which is something that most FABs are indeed doing, at least in part.
4. Common CNS infrastructure - Joint planning, testing, certification and implementation of common CNS infrastructure developments.
5. Common ATM system infrastructure – A FAB level plan and implementation designed to reduce the range of systems and equipment in operation in the FAB to reduce life-time cost of ownership. This relates to ATM system functionality (e.g. conflict alert), includes HMI and the provision of support processes such as procedures and training, maintenance procedures and upgrade paths.
6. CNS support - Shared provision of joint services related to CNS including systems maintenance, calibration, type training and certification.
7. Shared ATSEP staff - Joint/sharing of ATSEP staff. This applies particularly to smaller states whose scale may be such that maintaining their capability is impractical or uneconomic.
8. Joint training – rationalising infrastructure [courseware, simulation, trainers, buildings] and personnel for training (ATCO, ATSEP) to remove the duplication in resource that currently exists.
9. Joint ancillary services - rationalising provision of joint services related to AIS and/or MET to remove the duplication that currently exists and realise economies of scale.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

10. Joint procurement - to realise potential buying power associated with a single procurement from a common vendor.

4.7.2 Relevant legal provisions

The legal provisions related to this criterion are found in article 9a(2) of EU Regulation 550/2004, which inter alia requires FABs to “be justified by their overall added value, including optimal use of technical and human resources, on the basis of cost-benefit analyses”.

4.7.3 Benchmarking

The following table summarises the benchmarking under the technical harmonisation and rationalisation criterion. The table distinguishes between projects that are being/have been implemented and those that are planned.

Table 22 Technical harmonisation and rationalisation: evidence of best practices per FAB

Best practices	BALTIC	BLUE MED	DANU BE	DK-SE	FAB CE	FABEC	NEFAB	SW FAB	UK-IRL
1.Harmonised Systems	I		P	I	I	I			I
2.Synchronised Life Cycles	I								
3. Coordination for new Technology Deployment	P	P	I	P		I			
4.Common CNS infrastructure	P		P, I	P	P	I		I	
5.Common ATM system infrastructure	P								
6.CNS support									
7.Shared ATSEP staff									
8.Joint Training				I	I	I			
9.Joint Ancillary Services							I		
10.Joint Procurement	P		P, I		I	I			

A further aspect of the benchmarking is to judge how advanced FABs are with each best practice. To this end we have assessed the evidence available and scored each activity

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

using the specific five-level assessment scale presented in section 4.1.3 (Table 13), noting that an absence of a best practice does not imply that one is necessary, but serves as a check on whether the FAB should be looking at implementing a best practice.

Table 23 Comparison of FABs by scoring against technical harmonisation benchmarks

	BALTIC	BLUE MED	DANUBE	DK-SE	FABCE	FABEC	NEFAB	SWFAB	UK-IRL	Total
1. Harmonised Systems	0.50		0.25	0.75	0.75	0.25			0.50	3.0
2. Synchronised Life Cycles	0.50									0.50
3. Coordination For New Technology Deployment	0.50	0.25	0.50	0.75		0.75				2.75
4. Common CNS infrastructure	0.50		1.0	0.50	0.50	0.50		1.0		4.0
5. Common ATM system infrastructure	0.50									0.50
6. CNS support										
7. Shared ATSEP staff										
8. Joint Training				1.0	0.50	0.25				1.75
9. Joint Ancillary Services							0.50			0.50
10. Joint Procurement	0.50		0.50		0.25	0.25				1.50
Total	2.50	0.25	1.75	3.0	1.75	1.75	0.50	1.0	0.50	13.0

The following paragraphs consider the possible reasons behind the benchmarking results:

1. Harmonised systems

Only Baltic FAB is actively working on a harmonised (common) ATM system capable of supporting interoperability on a system-to-system level. The focus is on a system level, both hardware and application.

There are other examples in the form of COOPANS alliance (5 ANSPs), the iTEC alliance (5ANSPs) and the Coflight/4-Flight alliance (3 ANSPs). The issue with these is that the partnerships are ANSP not FAB based. Thus any interoperability benefits, do not accrue to the FAB and they do not support standardisation of ATM in the FAB.

2. Synchronised life cycles

The lack of synchronised life cycles for the ATM system is a key reason offered for the FAB not harmonising ATM systems to create a common technology platform. Baltic FAB is the only FAB to realign lifecycles in order to adopt a common system.

Other FABs appear not to have addressed the possible costs and benefits. This possibly reflects the lack of ambition in the FAB operational concepts - if there is no intent to manage the airspace as a single entity there is no requirement for a common system and thus to synchronise lifecycles.

3. Coordination for new technology deployment

There are isolated projects identified in the study involving coordinated deployment at FAB level. Examples are:

- Baltic - AIXM 5.1 B2B data exchange

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- Danube – datalink
- DK-SE - COOPANS137, harmonised maintenance processes
- FABCE - cross-border network (X-bone)

However, many FABs report as FAB projects those that do not apply across the FAB and are thus ANSP not FAB initiatives.

Aside from Danube FAB and FABEC whose technical roadmap reflects priorities for deployment of SESAR and EATM Master Plan, FAB level coordination of technology deployment is limited. The requirements of the European ATM Master Plan, the Network Operations Plan, SESAR, the PCP and European ATM Master Plan (Level 3) – all of which require co-ordinated implementation – are not reflected in a parallel FAB plan in most instances. Rather implementation is managed at ANSP level.

4. Common CNS infrastructure

There have been a number of studies but implementation is limited.

- DANUBE FAB jointly plans its CNS infrastructure development and where possible conducts common procurement, which has already demonstrated savings in radar heads and AFTN.
- FABEC has decommissioned 4 radars and 10 are planned not to be replaced at their end-of-life as a result of a review of radar surveillance infrastructure.

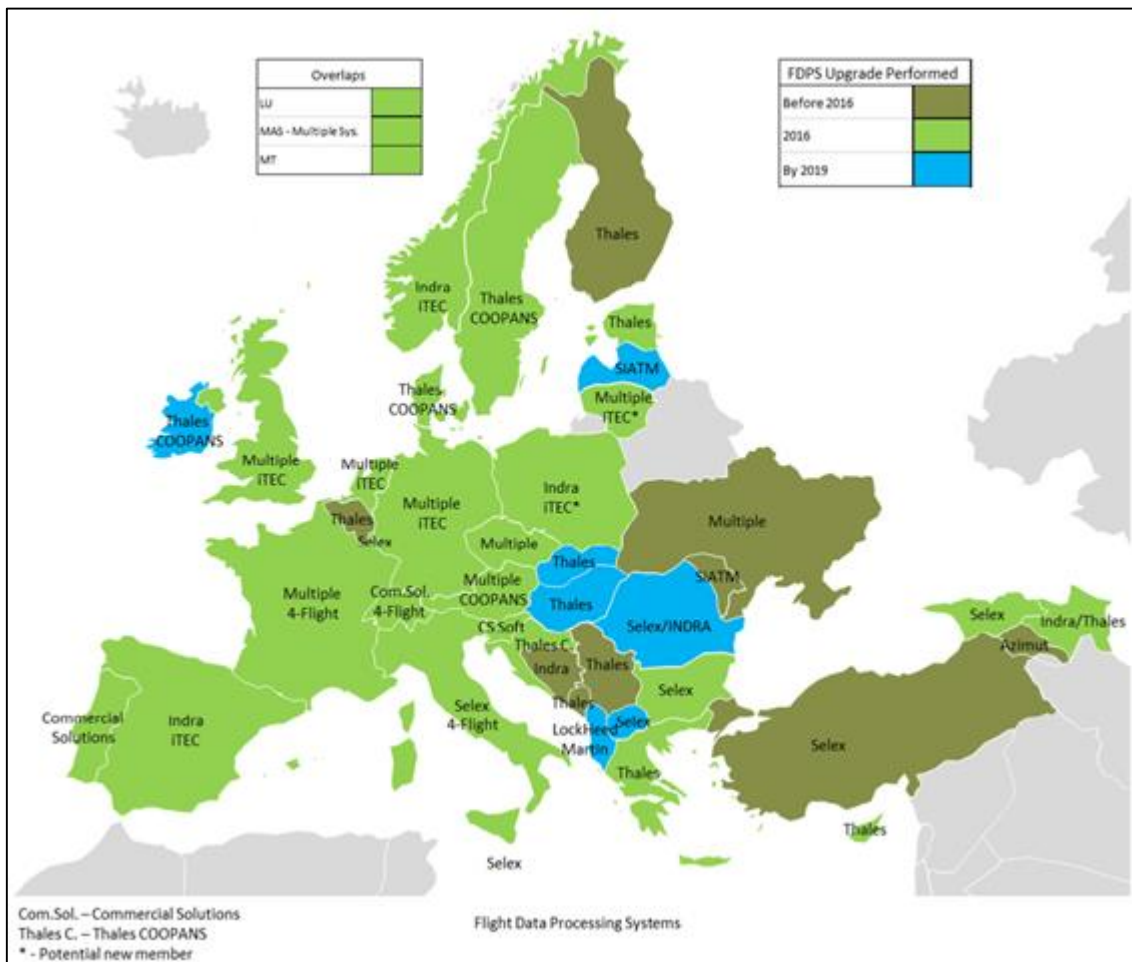
5. Common ATM system infrastructure

FABs are generally more likely to address systems through industrial partnerships, building on past investments rather than changing suppliers. Hence, aside from Baltic FAB, rather than a common ATM system infrastructure, FABs are planning common functionalities irrespective of systems. The figure below, taken from European ATM Master Plan (Level 3) 2015²⁵⁴, shows a difference in geographical spread between the FABs and the different industrial partnerships such as COOPANS and iTEC:

²⁵⁴ European Single Sky ImPlementation Plan, Edition 2015.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

Figure 61 ATM systems in use (Source: ESSIP 2015)



6. CNS support

We found no evidence of shared provision of joint services related to CNS including systems maintenance, calibration, type training and certification. ANSPs continue to maintain their own capability in this area. This is to be expected for larger ANSPs. For smaller ANSPs, aside from maintaining what must be underutilised resources, the options include outsourcing to third parties or vendors, including other ANSPs.

7. Shared ATSEP staff - Joint / sharing of ATSEP staff

We found no evidence of this occurring. This is to be expected for larger ANSP who have sufficient infrastructure to warrant a dedicated workforce. For smaller ANSPs, aside from maintaining what must be underutilised resources, the options include outsourcing to third parties or vendors.

8. Joint training

Most FABs have some plans around training, primarily in the form of sharing training course material and mutual recognition. However, individual ANSPs wish to maintain their own capability in terms of ATCO training. For ab-initio training, radar and specialist training (airspace or procedures design) external training is available on a commercial basis. Accordingly, there is a commercial and political dimension to co-operation.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

In terms of shared training resource:

- DK-SE – provides joint training for the DK-SE FAB through Entry Point North.
- FABCE – have a harmonized training of trainers concept in place and other FABs are planning similar 'light handed' cooperation.

9. Joint ancillary services

Aside from NEFAB, there are no other FAB initiatives for joint provision of support services in the form of AIS or MET beyond various studies. Each ANSP maintains its own capability (or procures services) independent of the FAB.

SAR is typically provided in conjunction with the state military, occurs irregularly and provides comparatively limited opportunity to unlock value.

10. Joint procurement

There is some joint procurement on a FAB basis. Notably:

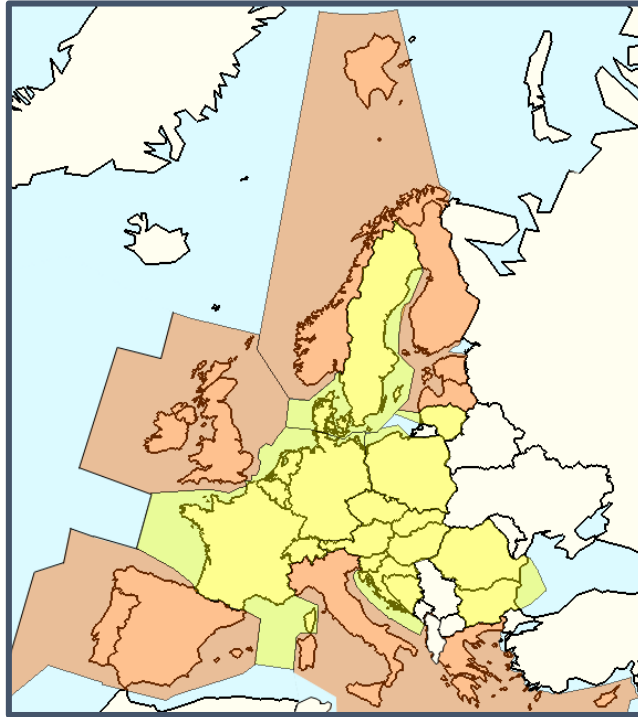
- BALTIC - Joint procurement of common FDPS [iTEC] is planned.
- DANUBE – Joint procurement of VCS system in 2015. They endeavoured to have joint air ground communication services procurement but the vendor advised the commercial arrangements would be the same whether a FAB or individual procurement.
- FABCE - upgrade of the cross-border telecommunications network (X-bone) hardware.

4.7.4 Overview of results

To align the benchmarking with the other criteria, the table and map below displays the overall results on a 3-point scale, where scores of <1.5 are regarded as having 'notable shortcomings', >1.5 as 'high potential for improvement' and > 5 as our threshold for 'best performing'.

FAB	Score
BALTIC	●●
BLUE MED	●
DANUBE	●●
DK-SE	●●
FABCE	●●
FABEC	●●
NEFAB	●
SWFAB	●
UK-IRL	●

Figure 62 Technical harmonisation and rationalisation - Overview of benchmarking results per FAB



4.7.5 Best practices

Of the identified best practices in section 4.7.1, those already implemented by FABs are:

1. Harmonised Systems
3. Coordination for new Technology Deployment
4. Common CNS infrastructure
8. Joint Training
9. Joint Ancillary Services
10. Joint Procurement

With the following mostly unaddressed:

2. Synchronised Life Cycles
5. Common ATM system infrastructure
6. CNS support
7. Shared ATSEP staff

4.7.6 Recommendations

Technically, rationalisation is feasible and economically there are practices that make sense to varying degrees in different FABs. A missing component may be the drive for rationalisation. The realisable benefits available from the application of best practice in this area also require a change in the existing model of ANSPs, which are currently self-sufficient in aspects such as training, systems maintenance and specifying and procuring

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

their own systems. The previous recommendations on business planning and scrutiny by airspace users should help to challenge FABs to address these areas. However, how FABs achieve technical harmonisation and rationalisation of infrastructure and support services is for the FAB to decide. This may include arrangements through industrial partnerships or the FAB partners.

If the early write-off of assets is an impediment to systems harmonisation and it is not provided for in terms of calculation of charges, specific provision could be made allowing for cost recovery, but this would require further study.

Consideration could also be given to FABs being engaged as agents for the coordination of technical (and operational) roadmaps for SESAR deployment leveraging their position as a regional entity responsible for planning and managing the implementation of new operational and technical concepts, consistent with the European ATM Master Plan, across a group of countries. However, it is also noted that industrial partnerships may be the more appropriate vehicle. The SESAR Deployment Manager is interacting with FABs on a limited basis and there may be an opportunity to increase this.

There are also some potential actions in respect of ATM system interoperability:

- A higher level of abstraction between different systems platforms can improve harmonisation. Examples are SESAR's SWIM, CDM and Airport-CDM, as well as a lower abstraction level through FMTP, OLDI and ASTERIX protocols that are already widely implemented. All of these will help open up more information exchange between the different actors in a loosely coupled manner to avoid monolithic system architecture. Here the industry has a vital role to play by supporting the ANSPs to design systems with an open information architecture with open and standardised interfaces that in a cost-effective, flexible and safe way support the interoperability of the information management.
- Common specifications will serve as a foundation for the NSA, for industry and the ANSPs during system development through to regulatory approval, deployment and commissioning. If the industry and the ANSPs can share the same common specification or set of common specifications and associated requirements, interoperability will be achieved, system costs will reduce, support costs will reduce (procedures and training in particular), and time to deployment will be reduced.

4.8 FAB governance and customer engagement

4.8.1 Definition of benchmarking criterion

In the context of this study, FAB governance is understood to comprise the arrangements, structures and processes ensuring the successful implementation of the FAB. This includes:

- the institutional structures and processes at all levels of FAB activity (State, NSA and ANSP level);
- the administrative and support functions essential for the effective coordination and management of FAB activities;

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- stakeholder consultation and customer engagement;
- FAB-level social dialogue.

FAB governance is from our perspective an enabler of a FAB's success and instrumental for the timely delivery of benefits to stakeholders. By contrast, inadequate or dysfunctional governance arrangements would in our view inevitably lead to the failed implementation of FAB objectives.

Drawing on the abovementioned observations, the benchmarking criterion on "FAB governance and customer engagement" delves into the following aspects of FABs:

- Governance arrangements: How is the FAB governance organised, structured and facilitated?
- Customer engagement: The FAB procedures in place for consulting airspace users, and the engagement of airspace users in the development of FAB activities. We also include as part of this component the overall transparency of FAB activities, and the communication of relevant, up-to-date information.

The effective management of the FAB social dimension, including appropriate social dialogue arrangements, is also an important part of the FAB governance. This element is examined separately under section 4.9.

4.8.2 Relevant legal provisions

The SES legal provisions related to the "FAB governance and customer engagement" benchmarking criterion are the following:

- Annex Part I, Commission Regulation 176/2011: each FAB is required to be founded on legal instruments defining the mutual agreement between Member States, the arrangements between the NSAs within the FAB, the arrangements between ANSPs within the FAB, and the arrangements between competent civil and military authorities. These elements underpin the governance structure of each FAB.
- Article 10, EU Regulation 549/2004: Member States are required to establish consultation mechanisms for the appropriate involvement of stakeholders (including airspace users) in the implementation of the single European sky. FABs being an essential part of the SES legislation, their implementation falls within the scope of the abovementioned article.

4.8.3 Benchmarking

As specified above, this benchmarking criterion is built around two components: the FAB governance arrangements (analysed in section 4.8.3.1) and customer engagement (analysed in section 4.8.3.2).

4.8.3.1 Governance arrangements

Each FAB needs a sound institutional structure, with clearly allocated responsibilities and interfaces between the various decision-making levels (State, NSA and ANSP).

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

This sub-section presents the benchmarking analysis of the governance arrangements in place in the various FABs. We examine which actors are responsible for FAB high-level governance in the various FABs and to what extent the observed governance structures and processes are consistent with the SES legal provisions and enable effective FAB implementation.

Our approach to the benchmarking of FAB governance is based on a qualitative evaluation of the structures and processes by which the FABs are governed and managed. In accordance with the general assessment scale outlined in section 4.1.3, the benchmarking scores for the FAB governance should be understood as follows:

- One point (●) indicates that the FAB’s governance was not found to be fully consistent with the applicable regulatory principles. These FABs should take swift action to address the findings, also with a view to ensuring compliance with SES regulatory requirements.
- FABs scoring two points (●●) have a governance model deemed to be compliant with the regulatory requirements, but which efficiency should be improved through the implementation of appropriate best practices.
- FABs scoring three points (●●●) have well-functioning governance frameworks and are implementing one or several solutions identified by the study team as best practices.

As an introduction to the benchmarking analysis, Table 24 below provides a comparative overview of the high-level decision-making responsibilities within the FABs. As a general observation, it should be noted that the decision-making in all FABs is primarily based on the consensus principle.

Table 24 FAB high-level decision making

FAB	High-level decision making body	Members (decision-makers)
BALTIC	BALTIC FAB Council	Ministries of Transport, Ministries of Defence, NSAs, ANSPs
	BALTIC FAB Board	Same as above
BLUE MED	BLUE MED Governing Board	High-level civil (Ministry/CAA) and military representatives
DANUBE	DANUBE FAB Governing Council	Ministries of Transport, Ministries of Defence, NSAs, ANSPs
DK-SE FAB	FAB Board	Transport Authorities (CAAs/NSAs)
FAB CE	FAB CE Council	Ministries of Transport, Ministries of Defence
FABEC	FABEC Council	Ministries of Transport, Ministries of Defence

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

FAB	High-level decision making body	Members (decision-makers)
NEFAB	NEFAB Council	Ministries of Transport, Ministries of Defence
SW FAB	SW FAB Council	Spain: DGAC (MoT), MIL authority (MoD) Portugal: CAA, Military Aviation Authority
UK-IRL FAB	FAB Supervisory Committee	NSAs
	FAB Management Board (FMB)	ANSPs, MIL, customer representatives

Table 24 shows that the high-level governance in all FABs is ensured through a “Council” or “Board” which is entrusted with the overall responsibility for the implementation of the FAB, pursuant to the FAB State-level Agreement. However, there are differences between the FABs as regards the allocation of decision-making responsibilities to the various actors. We will get back to this point in the detailed analysis.

Table 25 below presents the qualitative analysis and benchmarking of FAB governance arrangements.

Table 25 FAB governance arrangements - appraisal per FAB

FAB	FAB governance arrangements	Score
BALTIC	<p>The BALTIC FAB governance framework regroups all the key activities of the FAB under a single structure, which covers all the levels of FAB activity (State, ANSP, NSA). Accordingly, the FAB Council and FAB Board include representatives from Ministries (both Transport and Defence), ANSPs and NSAs. The same principle applies to the FAB committees, with the exception of the NSA Coordination Committee which only includes NSA representatives.</p> <p>From an external perspective, it is not evident to what extent the need for two high-level governance bodies (the FAB Council and FAB Board) is justified in the current, consolidated FAB set-up.</p> <p>Whilst the applied governance structure undoubtedly ensures the effective involvement of both State and ANSP level actors, the ANSP participation as decision-maker in the BALTIC FAB Council and Board appears problematic in the light of the principle of separation (at least functional) between service provision and oversight functions, which is a key principle of SES²⁵⁵. For example, the Baltic FAB Board (including ANSP</p>	0

²⁵⁵ Article 4, EU Regulation 549/2004.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

FAB	FAB governance arrangements	Score
	members) is responsible for approving the FAB performance plan which sets out the performance targets applicable to the ANSPs.	
BLUE MED	<p>The BLUE MED Governing Board, representing States provides the high-level governance of the FAB. Under the Governing Board, three Committees (ANSP, NSA, CIV-MIL) are responsible for developing FAB activities. ANSP-level responsibilities are further allocated to working groups.</p> <p>In terms of structures, the BLUE MED FAB governance is on a sound basis. However, it was not possible for the study team to ascertain to what extent the NSA level governance structures of the BLUE MED FAB are actually operational, as no response was received to the study questionnaire regarding NSA activities.</p>	●●
DANUBE	<p>The DANUBE FAB governance structure is composed of the DANUBE FAB Council (comprising State, NSA, MIL, and ANSP representatives), the Airspace Policy Body, the NSA Board and the ANSP Board. The ANSP Board is assisted by the Strategy and Planning Standing Committee and supported by the Administrative Cell.</p> <p>The ANSP participation as decision-maker in the DANUBE FAB Council appears problematic in the light of the principle of separation (at least functional) between service provision and oversight functions, which is a key principle of SES. For example, the DANUBE FAB Council (including ANSP members) is responsible for approving the FAB performance plan sets out the performance targets applicable to the ANSPs.</p>	●
DK-SE FAB	<p>In the DK-SE FAB, the FAB high-level governance has been delegated by State governments to the CAAs/NSAs. The ANSP pillar of the FAB is managed through the NUAC company. The NSAs have set up five dedicated working groups (incl. for civil-military cooperation aspects).</p> <p>By and large, the DK-SE FAB governance model reflects a vision of the FAB as a technical rather than political construct, and hence governance appears to be operationally driven.</p>	●●●
FAB CE	<p>The FAB CE governance framework is clearly divided between State structures and ANSP structures. The FAB CE Council is the high-level governing body at State (Ministry) level, whilst the ANSP CEO Committee is responsible for ensuring and overseeing the implementation of ANSP level actions.</p> <p>Both the State and ANSP level have dedicated committees and working groups. ANSP level activities are supported by FAB CE Aviation Services Ltd, which is a joint legal entity established</p>	●●●

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

FAB	FAB governance arrangements	Score
	<p>by the FAB CE ANSPs. This contributes positively to the overall governance and management of the FAB.</p> <p>In terms of decision-making principles, the FAB CE legal arrangements foresee the possibility for the FAB CE Council to adopt “measures” by a simple majority of votes in cases where consensus cannot be reached. The measures concerned are related to the “implementation, further development and operation of FAB CE” (including as regards the harmonisation of materials, the adoption of the FAB Performance Plan). These measures need to be in line with the decisions of the FAB CE Council concerning the strategic level principles, objectives and policy (which need to be adopted by unanimity).</p> <p>The abovementioned model is viewed positively by the study team as a means to ensure that the FAB is able to make progress in respect of essential implementation actions.</p>	
FABEC	<p>FABEC has clearly distinct State and ANSP level institutional structures, with their own committees and support functions. The FABEC Council (highest State-level body) and the ANSP Strategic Board (highest decision-making body at ANSP level) also hold joint meetings in the framework of the Air Navigation Services Consultative Board.</p> <p>The FABEC governance structure has the highest level of complexity of all FABs, and comprises multiple levels and layers of activity. This may be due to the high number of participating States and ANSPs, as well as to the FAB’s complex operational environment.</p>	●●
NEFAB	<p>NEFAB has a lean governance structure, with the NEFAB Council as high-level governing body representing the State-level authorities (Ministries of Transport and Defence). The NEFAB Council is supported by three State-level Committees (Finance and Performance Committee, NSA Committee and Civil-Military Committee).</p> <p>ANSP level activities are managed through the NEFAB ANS Programme, governed by the CEO Board and the Management Board. The link and coordination with State-level activities is guaranteed through the ANS Consultative Board.</p> <p>The ANSP side activities are managed on a project basis with the support of the Programme Management Office – there are no permanent committees/bodies apart from the Management Board.</p>	●●
SW FAB	<p>The SW FAB is governed by the FAB Council which comprises the high-level State aviation authorities. The FAB has a clear institutional structure divided into the ANSP and NSA level</p>	●●

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

FAB	FAB governance arrangements	Score
	activities, and managed through a limited number of committees. All the FAB bodies (including the NSA Supervisory Committee and the ANSP Operational Board) have a dual civil-military character. The Standing Secretariat is responsible for supporting the FAB Council activities.	
UK-IRL FAB	The UK-Ireland FAB has a light governance structure with strong links between the ANSP and NSA level activities. State-level governance responsibilities are delegated to the CAAs/NSAs who cooperate through the FAB Supervisory Committee and report to their respective ministries. The ANSP level governing body (FAB Management Board) has a prominent role and provides the strategic directions for the FAB. Military stakeholders and airspace user representatives take part in the FAB Board and working groups. The UK-Ireland FAB is the only FAB with a direct airspace user involvement in the FAB governance.	●●●

The following general conclusions can be drawn based on the benchmarking of FAB governance arrangements:

- The consensus-based decision-making model applied by FABs has apparent and well-known downsides. For example, decisions may be delayed due to the time needed for reaching consensus, and adopted decisions may reflect the “lowest common denominator” and thus lack ambition. Furthermore, this may potentially even result in the inability of the FAB to make progress on key aspects of the cooperation. For example, a FAB level project may not be endorsed if it does not generate individual benefits to each FAB member, even if the overall added value of the project for the FAB and the ANS network is clearly demonstrated.
- The consensus-based decision-making model is enshrined in the legal instruments of each FAB. In the case of 2-State FABs, other options (i.e. majority-based decision-making) are difficult to implement. Nonetheless, there should be a possibility for governing structures within multi-State FABs to adopt decisions based on a simple majority of votes in cases where consensus cannot be reached. This possibility should apply at least in matters related to the implementation of FAB strategic plans and objectives, which have been already approved by the FAB high-level governing body or bodies. This solution is already applied by FAB CE, as outlined in the table above.
- Furthermore, FAB implementation should not prevent smaller groups of States or ANSPs within multi-State FABs to establish enhanced cooperation arrangements, even if the project or activity concerned is not supported by all FAB members.
- Our analysis shows that FAB governance arrangements have been designed as a reflection of the State, NSA and ANSP dimensions of the FAB concept. Accordingly, in most FABs the ANSP level institutional structure is clearly separated from the State/NSA level structures, with coordination and consultation

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

mechanisms in place between the two dimensions. Nonetheless, each FAB has its specific institutional features, and governance arrangements have been tailored based on the FAB priorities, the number of countries involved, and the division of roles and responsibilities.

- The FABs with the highest number of participating States (i.e. FABEC and FAB CE) have more complex and granular institutional structures (with more committees, working groups etc.) than the two-state and four-state FABs. This is assumed to be due to the higher number of entities and persons involved in the FAB activities.
- Most of the FABs have vested their high-level decision-making and governance responsibilities with Ministry-level authorities. In the case of three FABs (FAB CE, FABEC, NEFAB), only Ministry-level authorities are formally empowered to make decisions on FAB high-level governance matters.
- By contrast, within the DK-SE FAB, the FAB high-level governance has been delegated to the CAAs/NSAs. Within the UK-Ireland FAB, State-level governance responsibilities are also delegated to the CAAs/NSAs, but the FAB Management Board (which is chaired by ANSPs and includes MIL and customer representatives) has the leading role in defining the FAB strategy. In the case of the SW FAB, one Member State is represented in the FAB Council by Ministry-level representatives whereas the other Member State has delegated the responsibility to the regulatory authorities.
- Two FABs (BALTIC, DANUBE) have a mixed system where the Ministries, NSAs and ANSPs all take part in the high-level governing body as decision-makers. This gives rise to possible concerns in the light of the SES requirement setting out the separation (functional, at least) between the service provision and oversight functions. Therefore, it is advisable that ANSPs have an observer status in the FAB high-level decision making body in charge of approving the FAB performance plan.
- All the FABs, with the exception of the DK-SE FAB, have included military stakeholders (Ministries of Defence or relevant military authorities) as decision-makers in the high level FAB governance structures. The DK-SE FAB addresses the civil-military dimension of the FAB by including MIL stakeholders as observers in the FAB Board and through a CIV-MIL working group set up under the auspices of the FAB Board. Dedicated civil-military committees within FABs are also found within the BLUE MED FAB, FAB CE, and NEFAB. The SW FAB structures, both at ANSP and NSA level, include both civil and military entities.
- The UK-Ireland FAB has directly involved customer representatives (airspace users) in their governance structure. As highlighted by the UK-Ireland FAB at the final workshop of the FAB study, this arrangement is seen as beneficial by all the involved actors. The experience shows that the FAB development is facilitated by the customer inclusion and input into the process.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- Administrative and technical support functions were observed to be important enablers for successful FAB governance. The responsibility for this usually lies with the ANSPs who have established “management offices” or “administrative cells”, supporting the management of ANSP level activities of the FAB.
- NSA activities are mainly not within the scope of the FAB administrative support arrangements. The exception to this is FABEC which has a specific administrative and technical support structure also for State-level activities (the FABEC States Bureau).

4.8.3.2 Customer engagement

Customer engagement is an integral part of FAB governance. FABs ought to involve airspace users in the FAB development and consult them on the implementation.

The prerequisite for customer engagement is the provision of relevant and comprehensive information on the conducted FAB activities and achieved results. This first component of customer engagement is examined in Table 26 below, through a qualitative benchmarking assessment. The related benchmarking scores should be interpreted as follows, in accordance with the general approach presented in section 4.1.3:

- The lowest score, one point (●), means that the FAB website does not contain comprehensive information on the FAB status and the FAB does not publish annual reports or news updates. The FABs concerned should enhance the transparency of their activities and their communication towards stakeholders.
- Two points (●●) are given to FABs which communicate regularly towards stakeholders through their website, but do not publish annual reports, updated deliverables or comprehensive updates on the progress made in the FAB implementation. Hence, there is potential for better transparency and communication.
- Three points (●●●) indicate that the FAB has a good level of transparency of activities and communicates actively towards stakeholders. In addition, the FAB publishes an annual activity report and other up-to-date FAB deliverables.

Table 26 Transparency and communication - appraisal per FAB

FAB	Transparency and communication	Score
BALTIC	<p>The study team is aware that the BALTIC FAB has produced progress reports on the implementation of its activities, but these documents are not published online.</p> <p>The FAB website provides a general introduction of the FAB background, governance and components. The number of published deliverables is limited and the available documents relate mostly to the FAB establishment period. There are no recent news updates on the FAB activities.</p>	●

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

FAB	Transparency and communication	Score
BLUE MED	<p>No FAB annual report produced (only performance monitoring report). However, BLUE MED is producing on an annual basis a 'BLUE MED Flight Efficiency Plan' (FEP) which is providing all the related data to the ATM Stakeholders.</p> <p>The BLUE MED FAB website provides a comprehensive overview of the FAB structure and key activities. News updates and newsletters are regularly posted on the website. However, there is only a very limited number of FAB deliverables (legal and technical documentation) published on the website. More updated documents could be made available online.</p>	○○
DANUBE	<p>The DANUBE FAB produces and publishes an annual report regarding each calendar year.</p> <p>The DANUBE FAB website includes a number of sections, outlining the FAB institutional and operational features, strategic objectives and key activities. All the key FAB documentation (including updated versions) is available on the website. Furthermore, the website offers regular news updates on the FAB developments.</p>	○○○
DK-SE FAB	<p>NUAC annual reports are not available online.</p> <p>The NUAC HB website summarises the key information relating to the service provision arrangements in the FAB context, but there are no FAB documents or news updates published on the site. General information on the FAB activities can also be found on the websites of the national ANSPs and CAAs.</p>	○
FAB CE	<p>FAB CE does not publish annual activity reports.</p> <p>FAB CE has a webpage summarising the key information relating to the service provision arrangements in the FAB context. Basic documents concerning the FAB governance arrangements are published. The website provides regular news updates.</p>	○○
FABEC	<p>The FABEC website provides a comprehensive overview of the FAB background, objectives and activities. Regular news updates are published. Some basic FAB documents (incl. the RP2 FAB Performance Plan) are published on the website – however, some other key deliverables such as the FAB Implementation Plan or annual reports are not published.</p>	○○
NEFAB	<p>The NEFAB website provides a wide range of information and updates on the status and activities of the FAB. The website also supports live communication through features such as highlights of the latest news items, archives, an extensive section on Free Route Airspace, a subscription tool, and links with social networks. All the key NEFAB documents and deliverables (incl. updated versions) are published on the website.</p>	○○○

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

FAB	Transparency and communication	Score
SW FAB	The SW FAB website provides a comprehensive view of the FAB activities. All the key FAB materials are published on the website, including agreements, terms of reference of FAB bodies, annual reports, FAB plans etc. The documentation on the website is up-to-date. FAB developments are regularly highlighted through news releases.	●●●
UK-IRL FAB	The UK-Ireland FAB has not recently published annual reports on the FAB implementation (the latest available report covers calendar year 2012). The UK-Ireland FAB website provides comprehensive information on the key FAB projects and developments, the FAB objectives and essential facts. The website includes advanced features such as a video presentation of the FAB concept and of the UK-Ireland FAB activities. A number of FAB documents are published on the website, including the FAB Implementation Plan update dated December 2014.	●●

As a second component, we have assessed in Table 27 below the mechanisms and activities implemented by FABs as regards the consultation and involvement of airspace users.

The related benchmarking results should be read as follows:

- FABs who do not regularly consult airspace users on FAB implementation are awarded one point (●). The FABs concerned should ensure that they set up a regular customer engagement process, which should comprise at least an annual consultation meeting and any other solutions deemed appropriate. The consultation should allow airspace users to express their views on the whole scope of FAB implementation, and should not be limited to performance scheme implementation.
- FABs with a regular consultation process of airspace users get two points (●●).
- A three points score (●●●) is awarded to FABs having a regular consultation process and enabling the participation of airspace users in the FAB governance structure, thus allowing users to shape FAB priorities and initiatives.

Table 27 Consultation and involvement of airspace users - appraisal per FAB

FAB	Consultation and involvement of airspace users	Score
BALTIC	Annual stakeholder consultation meeting once per year on the FAB implementation, with airspace users and trade unions.	●●
BLUE MED	The first BLUE MED Customer Care meeting was held in April 2016 at Rome Fiumicino Airport.	●●

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

FAB	Consultation and involvement of airspace users	Score
	Dedicated email address with the aim of improving communications between Airspace Users and the BLUE MED FAB.	
DANUBE	No specific consultation mechanism on FAB implementation (only regarding performance scheme aspects).	○
DK-SE FAB	The DK-SE FAB has a formalised consultation mechanism of airspace users on FAB related aspects. The consultation takes place once a year.	○○
FAB CE	No specific consultation mechanism on FAB implementation (only regarding performance scheme aspects).	○
FABEC	FABEC has a formalised mechanism for the involvement and consultation of airspace users and which includes three levels of interaction. A Customer survey is conducted every two years and followed by an Action Plan.	○○○
NEFAB	Airspace users are invited to annual consultation meetings. A dedicated area for airspace users has been developed on the NEFAB website in order to summarise and distribute all the relevant information for airspace users, and to communicate on the outcome of consultations.	○○
SW FAB	Stakeholders Consultation Forum (SCF): the first session was held in 2015 and attended by representatives of the Commission, the Network Manager, associations of airlines, staff, pilots and controllers from both States as well as SW FAB civil and military expert members from SAC and OB. Decisions regarding the increased involvement of airspace users (AUs) and professional staff associations in the operational project development were agreed in order to improve the next SCFs.	○○
UK-IRL FAB	Customer representatives are an integral part of the FAB governance structure and take part in the FAB groups. This includes airspace user representation in the FAB Management Board (FMB).	○○○

The following overall conclusions can be drawn on customer engagement within the FABs:

- The level of transparency of activities varies significantly between the FABs.
- Whilst each FAB has a dedicated website, there are wide differences in the comprehensiveness and quality of the provided information. In some cases, the published information and deliverables only relate to the FAB establishment phase and very few updates are provided on the FAB progress.
- As regards the FAB documentation available online, we observe that only three FABs (DANUBE, NEFAB, SW FAB) systematically publish annual activity reports and implementation plans. Most FABs (BLUE MED, DANUBE, FABEC, FAB CE,

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

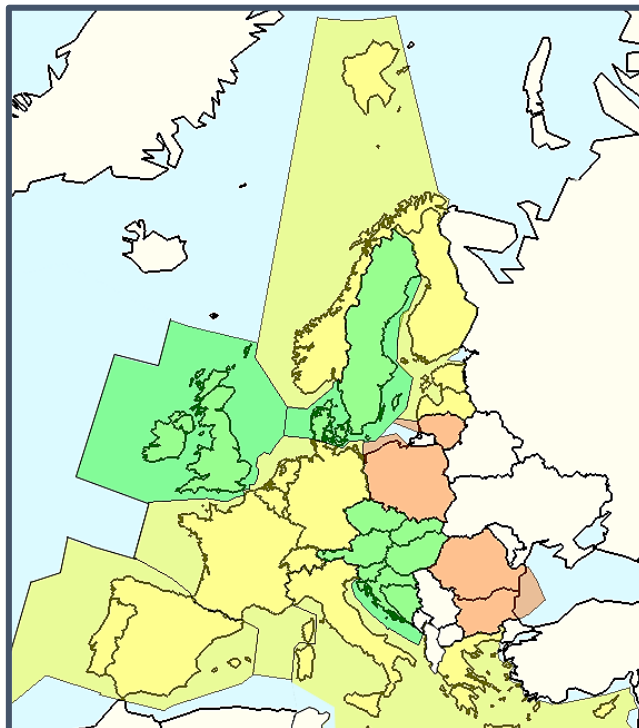
NEFAB, SW FAB, UK-IRL FAB) regularly issue online news updates and summaries.

- All FABs carry out stakeholder consultation in relation to FAB performance planning and monitoring, in accordance with Implementing Regulations 390/2013 and 391/2013. However, effective customer engagement requires a more proactive approach and FABs should not rely on minimum stakeholder consultation requirements alone.
- Accordingly, seven FABs (BALTIC FAB, BLUE MED FAB, DK-SE FAB, FABEC, NEFAB, SW FAB, UK-IRL FAB) have established regular, formalised mechanisms for the purpose of regularly engaging airspace users on the FAB development and implementation. Many FABs have organised annual consultation meetings since the FAB establishment, whilst others have applied this approach more recently.
- In the case of the UK-Ireland FAB, airspace user representatives participate in the FAB governance structure and thus contribute directly to the FAB development.
- Two FABs (DANUBE, FAB CE) have no formalised, regular customer engagement mechanisms in place for the purpose of consulting airspace users on the FAB implementation.

4.8.4 Overview of results

The maps below display the overall results of the benchmarking analysis for the “governance and customer engagement” criterion.

Figure 63 FAB governance arrangements - Overview of benchmarking results per FAB



Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

Figure 64 Transparency and communication - Overview of benchmarking results per FAB

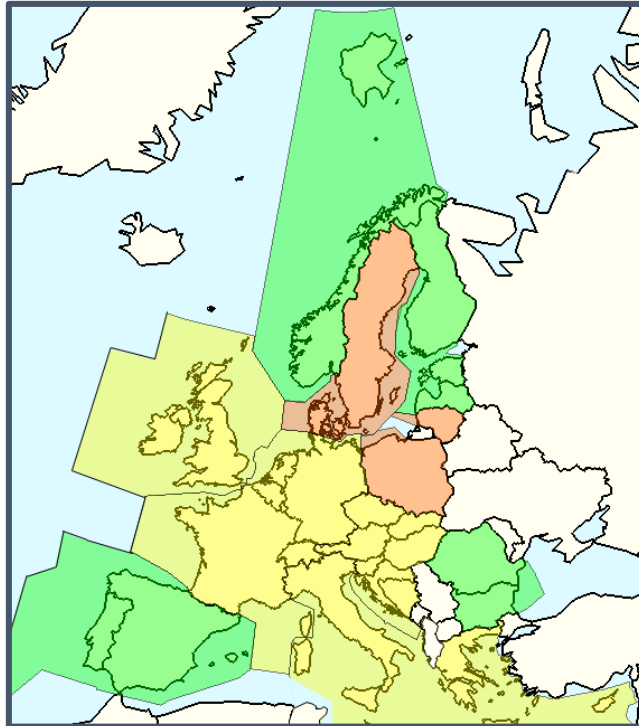
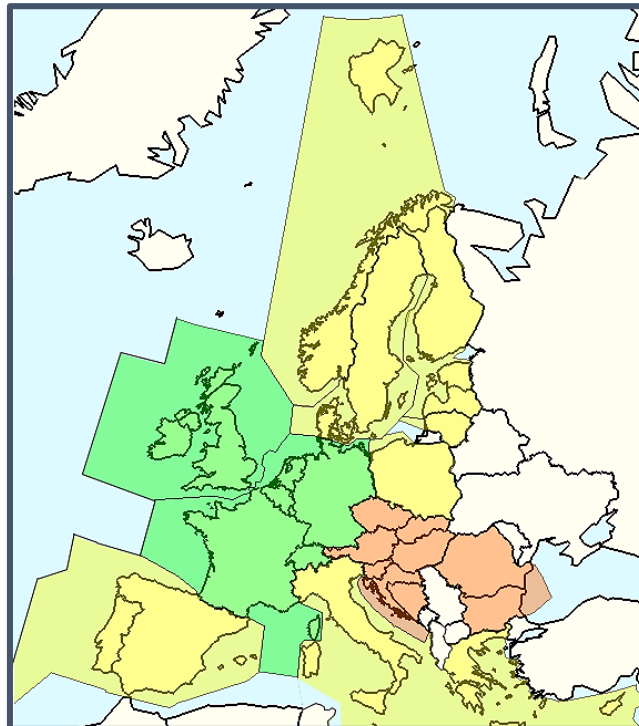


Figure 65 Consultation and involvement of airspace users - Overview of benchmarking results per FAB



4.8.5 Best practices

The identified best practices (already implemented by FABs) relating to FAB governance and customer engagement are summarised in the table below:

Table 28 Identified best practices - governance and customer engagement

<i>Component</i>	<i>Best practices</i>
Governance arrangements	<ul style="list-style-type: none"> • Involvement of MIL users in FAB governance • Common FAB legal entity supporting FAB governance and management • FAB governance delegated to the CAAs/NSAs, which are given the mandate to develop the FAB activities from the perspective of technical and operational requirements • (In multi-State FABs:) Possibility to adopt implementing measures by a simple majority of votes when consensus cannot be reached
Customer engagement	<ul style="list-style-type: none"> • Availability of FAB information and documentation online, e.g. publication of the up-to-date FAB implementation plans and annual reports • Regular stakeholder consultation meetings, supported by the timely provision of relevant information • Involvement of airspace users in FAB governance structures and working groups

4.8.6 Recommendations

We recommend the following guiding principles for developing FAB governance and customer engagement:

- **Efficient management:** FAB structures and governance processes should be simplified as far as possible. Superfluous or duplicative structures should be discontinued. An efficient project management approach, with clearly allocated responsibilities, should be applied to all FAB implementation activities and administrative burdens minimised. The establishment of a joint legal entity with FAB management responsibilities is recommended, as this allows a coordinated, harmonised approach supporting both FAB governance and implementation.
- **Efficient decision-making:** There should be a possibility for governing structures within multi-State FABs to adopt decisions based on a simple majority of votes in cases where consensus cannot be reached. This possibility should apply at least in matters related to the implementation of FAB strategic plans and objectives which have been already approved by the FAB high-level governing body or bodies.
- **Flexibility:** The governance arrangements within the multi-State FABs should allow smaller groups of States or ANSPs to implement enhanced cooperation,

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

even if the project or activity is not supported by all FAB members. The same flexibility is also needed in respect of inter-FAB industrial partnerships.

- Clear vision: Each FAB should ensure that there is a shared vision on the strategic goals allowing the FAB to succeed. It is the role of the FAB high-level governing body to provide the needed strategic direction and to follow up on its realisation. The current FAB strategies and objectives remain in many cases ambiguous, as pointed out by stakeholders consulted in the framework of this study. Each FAB should therefore establish and regularly update a business plan which will guide FAB entities in successfully implementing the joint activities.
- Focus on technical progress: FABs are seen by many observers as political projects rather than as technical and operational initiatives. Our stakeholder survey confirmed that political considerations (reflecting differing national priorities and interests relating to State-owned ANSPs) affect FAB governance and in some cases weight significantly on the progress of FABs. FABs should recalibrate their governance on the delivery of key technical and operational benefits. A possible solution is the delegation of power by the State-level to the competent regulatory authorities (CAAs/NSAs), with a clear, well-defined mandate to develop the FAB activities from the perspective of technical and operational requirements. This model has been successfully implemented by the DK-SE FAB and similar arrangements are in place within the UK-Ireland FAB.
- Involvement of military stakeholders: Military stakeholders include military authorities (Ministry of Defence, air force, military NSAs) and the military providers of ATM/ANS. The close involvement of military stakeholders in the FAB governance structures is essential in order to ensure that the requirements of military users are duly addressed. However, our stakeholder survey highlighted that the current involvement of military stakeholders in the FAB activities needs to be further enhanced. FABs should, in coordination with their military stakeholders, identify appropriate solutions to strengthen the existing arrangements.
- Openness and consultation: FABs should ensure that their activities are transparent and that relevant information on the FAB plans and results is made available online. In addition, each FAB should have a regular mechanism for the purpose of consulting stakeholders, and FAB governing bodies should make sure that the established consultation mechanisms operate effectively in practice.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- Customer involvement in FAB governance: The participation of airspace users in the FAB governance structures is already a reality in the UK-Ireland FAB: this allows airspace users to contribute to the FAB deliverables and thus supports the FAB in applying relevant solutions. In our view, all FABs should aim to involve relevant airspace users in their governance structures in order to support FAB progress.

4.9 Effective management of the FAB social dimension

4.9.1 Definition of benchmarking criterion

As highlighted in the FAB Guidance Material published by the EC, "*social partners in a FAB should establish and use a formalised social dialogue at national and FAB level for communication and consultation on FAB issues*". However, whilst establishing social dialogue is an obligation, it is acknowledged that there are various ways in which to implemented this in a FAB context.²⁵⁶

In the context of this study, the "effective management of the FAB social dimension" comprises the setup of social dialogue mechanisms on the FAB level, and the effective implementation of the established mechanisms. The aim of the benchmarking analysis is hence to assess both the formal mechanisms and processes for social partner consultation and the quality of the social dialogue (regularity of dialogue, scope of discussed matters, staff representative influence on decision making on FAB level etc.).

4.9.2 Relevant legal provisions

The SES legal provisions related to the "effective management of the FAB social dimension" benchmarking criterion are the following:

- Article 10, EU Regulation 549/2004: Member States are required to establish consultation mechanisms for the appropriate involvement of stakeholders (including professional staff representative bodies) in the implementation of the single European sky. FABs being an essential part of the SES legislation, their implementation falls within the scope of the abovementioned article.

4.9.3 Benchmarking

The assessment of the FAB social dimension aims to determine whether the FABs have foreseen adequate social dialogue arrangements and whether these arrangements are effectively implemented.

Based on the observed status within FABs, two possible scores apply on the three tier scale defined for the benchmarking assessment:

²⁵⁶ Guidance Material for the Establishment and Modification of FABs, edition 2.0, section 7.4.13. Available online:
http://www.skybrary.aero/index.php/Archive:7.4.13_Social_factors_and_related_changes

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- One point (●): FABs who have no formal arrangements for FAB level social dialogue or who have not implemented in practice the arrangements foreseen in their FAB legal instruments;
- Three points (●●●): FABs having a formal agreement on the FAB social dialogue dimension and are properly implementing the agreed arrangements, enabling the coordination between the representatives of management and employees.

The table below presents the benchmarking analysis per FAB in respect of this benchmarking criterion.

Table 29 FAB level social dialogue mechanisms - appraisal per FAB

FAB	FAB level social dialogue	Score
BALTIC	<p>Social dialogue is included in the BALTIC FAB ANSP Agreement which stipulates that the CEOs of the ANSPs shall be responsible for “<i>coordinating common ANSPs positions with respect to the matters of social dialogue activities and external communication</i>”.</p> <p>Trade unions are invited to the annual FAB consultation meetings while ad-hoc meetings may be convened on the request of either the social partners or ANSPs.</p> <p>The existing framework does not constitute a FAB level mechanism for social dialogue but only includes the participation of trade unions in general consultation meetings.</p>	●
BLUE MED	<p>For BLUE MED, the Joint Declaration and ToRs signed by the FABs and the International Staff and Professional Associations in October 2011 represent the framework for setting up the Social Dialogue. This framework exists but there is no concrete evidence that this mechanism is implemented in practice.</p>	●
DANUBE	<p>In the DANUBE FAB, the Social Consultation Forum has been established as a mechanism for managing the social dialogue dimension. The SCF is a permanent body, which convenes representatives of management, trade unions and professional associations of both ANSPs with the objective of ensuring the social dialogue in the context of the DANUBE FAB.</p> <p>The SCF meetings take place twice per year and ad hoc meetings may be convened out of cycle, on request of either the social partners or ANSPs. There is also an option for written consultations. The outcome of the SCF activities are used as an input to the FAB ANS Board.</p> <p>The eleventh DANUBE FAB Social Consultation Forum (SCF) was held in Poiana Brasov, Romania on 26th of May 2016, where the social dialogue within the FAB was promoted and attention was given to the social issues arising from DANUBE FAB’s implementation. Thus, the study team concludes that a regular social dialogue process is implemented within the DANUBE FAB.</p>	●●●

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

FAB	FAB level social dialogue	Score
DK-SE FAB	<p>The NUAC company constitutes the focal point for DK-SE FAB social dialogue mechanism. The CEO of NUAC manages the social dialogue meetings on a quarterly basis. The regular list of meeting attendees includes the NUAC CEO, the NUAC HR Executive and trade union representatives from LFV (Sweden) and NAVIAIR (Denmark). The social dialogue meetings contain discussion and views on the strategic developments within the FAB, looking at the challenges and developments ahead and for sharing of information between participants on specific local issues experienced at national level.</p> <p>Through the NUAC FAB social dialogue mechanism, only FAB-specific issues are raised while NAVIAIR and LFV keep discussing the national social issues on local level.</p>	○○○
FAB CE	<p>The social dialogue within the FAB CE is established by virtue of the FAB CE Social Dialogue Charter (and amending Protocol). The signatories of this charter are the FAB CE CEO Committee (CEOC), Danube ATCU, FAB CE Unions Alliance and FAB CE Alpe Adria Alliance.</p> <p>The Charter defines the FAB CE developments and issues considered as directly affecting the employees (e.g. Education, Training and Licensing, Work Organisation, Safety and Just Culture, Mobility of ANS staff, etc.). The Social Consultation Forum is held at least twice a year and is co-chaired by the CEOC and one representative of staff. If necessary, each party may ask for an ad-hoc meeting. The FAB CE ANSPs have established a dedicated social dialogue focal point (appointed for one year), supported by a social dialogue coordinating team which includes representatives from all ANSPs.</p> <p>The evidence of effective implementation are the meetings undertaken in 2015 and 2016 under the umbrella of the Social Consultation Forum.</p>	○○○
FABEC	<p>FABEC has a three-layer approach towards implementing the effective management of the social dimension. The FABEC approach is underpinned by a Social Dialogue Manager with the overall responsibility for ensuring the FAB level social dialogue implementation within FABEC.</p> <p>On the first level of social dialogue within FABEC, there is a Social Dialogue Committee (SDC) which meets at least two times per year. The SDC provides the high level, formal framework for the discussion on ongoing FABEC developments. The second layer includes meetings between ANSP experts, the relevant Chair of the standing committees and social partners. The second layer meetings are held on an ad hoc basis to address specific matters or areas topics raised by either the ANSPs or the social partners. Third layer meetings are held on ad-hoc basis in case of issues and concerns raised in the first and second layer meetings, requiring further discussion and</p>	○○○

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

FAB	FAB level social dialogue	Score
	<p>comprehension. These meetings aim to strengthen, enhance and develop the social dialogue process.</p> <p>FABEC considers that “efficient and structured social dialogue is a key contributor to the successful implementation and operation” of the FAB. FABEC social dialogue activities are complementary to the existing national procedures: each ANSP also conducts regular social dialogue processes with their relevant staff representatives at national level, in parallel with FABEC level activities.</p> <p>The effective social dialogue implementation is visible through the number of regular consultation meeting covering different staff related topics. The latest social consultation meeting was held in September 2016.</p>	
NEFAB	<p>The NEFAB Programme is not directly communicating with the ANSPs’ personnel, trade unions or other staff representatives. The responsibility for communication with the personnel and trade union representatives is vested with the individual ANSPs. The NEFAB Programme has supported the ANSPs by developing presentation material on the NEFAB Programme.</p>	○
SW FAB	<p>Based on the gathered evidence there is no social dialogue mechanism being effectively implemented on FAB level.</p>	○
UK-IRL FAB	<p>Social Dialogue meetings are foreseen under FAB governance. This would consist in a bi-annual Social Dialogue meeting opportunity under the FMB as well as separate social dialogue initiatives within each ANSP.</p> <p>Based on the gathered information it appears that the FAB level social dialogue mechanism has not been implemented in practice.</p>	○

Considering the observations above, we summarise below our key conclusions regarding FAB effective implementation of the social dialogue mechanisms:

- There was no evidence for more than half of the existing FABs that there is any activity related to the implementation of the social dialogue aspect within the FAB.
- Most of the FABs have defined a formal setup of the social dialogue mechanism, through either the FAB ANSP Agreements or Terms of Reference of a specific Social Dialogue Forum/Committee.
- The level of social dialogue implementation activities varies significantly between the FABs. It can be observed that only four FABs were confirmed to effectively implement social dialogue processes on the FAB level (DK-SE FAB, FABEC, FAB CE, and DANUBE).
- In those FABs where effective social dialogue has been identified, the approach towards defining the social dialogue varies in terms of established mechanisms.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

There is “no common one approach fits all” concerning the social dialogue framework in FABs.

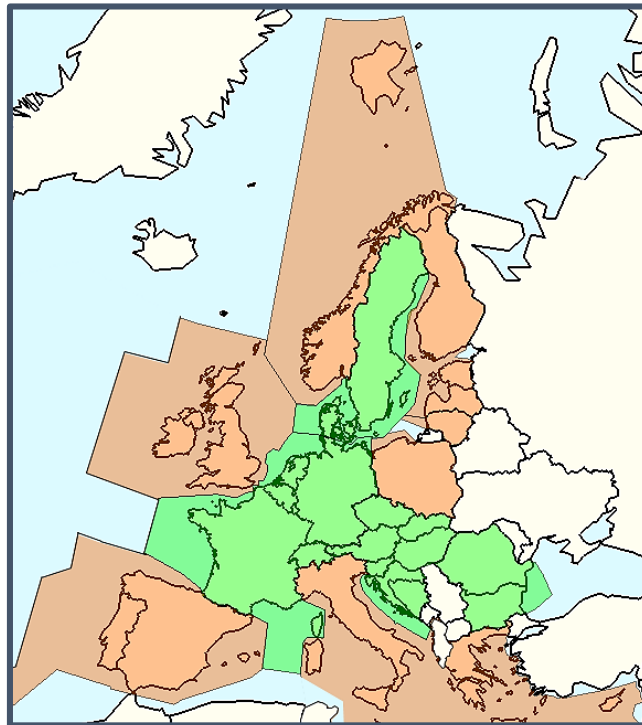
- The approach with a three-layered structure and Social Dialogue Manager enables appropriate dialogue at all levels (both management and expert levels), and ensures both “top-down” and “bottom up” approach and synergies in the implementation of the effective social dialogue.
- The approach built upon a Social Dialogue Charter defines the platform for consultation process, and defines a framework for the exchange of timely and comprehensive information and views between all parties.
- FABs which have effectively implemented a social dialogue mechanism have ensured that the staff opinion is being heard on the management level, by ensuring their presence on the consultation forums/meetings.
- Even though there are formalised FAB social dialogue mechanisms established in some of the FABs, the national level social dialogue is still regarded by all involved parties as much more significant. FAB level social dialogue is always complementary to the national level processes.
- As identified during the FAB Workshop held in Brussels and through the interviews with the stakeholders, the main benefits of applying social dialogue on a FAB level are the exchange of experience and cooperation, and ensuring that decision making is more transparent and that the voice of all social partners in the FAB is being heard.

4.9.4 Overview of results

The map below displays the overall results of the benchmarking analysis for the “Effective management of the social dimension” criterion.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

Figure 66 Effective management of the social dimension - Overview of benchmarking results per FAB



4.9.5 Best practices

The identified best practices (already implemented by FABs) relating to FAB social dialogue mechanisms are summarised in the table below:

Table 30 Identified best practices - social dialogue

Component	Best practices
Effective FAB level social dialogue	<ul style="list-style-type: none"> • Structured social dialogue with Social Dialogue Manager responsible for managing the FAB level social dialogue activities • FAB Social Dialogue Charter signed by all the FAB ANSPs and staff representative bodies (including national TUs and multi-State TU alliances) • Consultation Forum meetings at least twice a year • Focus on issues affecting directly the employees

4.9.6 Recommendations

- Each FAB should ensure the appropriate consultation of employee representatives on key FAB social issues. There are various possible formal arrangements relating to the implementation of the FAB level social dialogue. The regular, effective implementation of agreed formal arrangements is essential.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- For the FABs that have not defined or implemented any social dialogue mechanism, an option could be to investigate ongoing social dialogue mechanisms already put in place in identified FABs and adopt relevant best practices.
- The willingness for the implementation of the social dialogue on FAB level can be achieved if all the social partners understand the benefits of such arrangement and cooperation. All social partners should actively participate within the framework of the social consultation mechanisms on FAB level. The appropriate involvement of employee representatives in FAB level decision making should be ensured, and in accordance with generally accepted social dialogue principles, consultative arrangements should provide for involvement at such a stage that influence on the decision-making process is secured²⁵⁷.
- The social dialogue consultation mechanism and decision making process should be adjusted to accommodate the needs of specific FAB projects. The social partners' views and inputs should be identified based on a bottom-up approach in respect of FAB-specific projects that may affect the social dimension of a FAB.

4.10 NSA level cooperation

4.10.1 Definition of benchmarking criterion

In the context of this study, the NSA level cooperation is regarded as the effective implementation of arrangements between FAB NSAs for the purpose of beneficial mutual exchange of information, knowledge and experience, and with the aim of achieving greater harmonisation of NSA processes. Optimising NSA resources on FAB level, including the NSA procedures, processes and expertise, facilitates a more efficient and effective implementation of the NSA tasks.

The NSA level cooperation is considered both as an enabler for achieving the outcome of the FABs but also as an implementing factor, as the NSAs have to conduct specific FAB related tasks, deriving from the SES regulatory framework. The cooperation between NSAs is in our view an important factor, which fosters and facilitates FAB operational implementation.

NSA cooperation as FAB enabler cannot be measured in terms of specific FAB outcomes. In respect of evaluating NSA cooperation as a FAB implementing factor, it is important to identify the NSA activities which bring the most significant benefits on FAB level. Thus, our benchmarking criterion concerning "FAB NSA level cooperation" delves into the following components:

- Cooperation in terms of supervision of the application of the SES legislation;
- Harmonisation and sharing of resources;
- Effective and efficient process for FAB Performance scheme implementation.

²⁵⁷ ATCEUC-CANSO-ETF: Guidelines for Consultation arrangements for Functional Airspace Blocks
21st June 2012

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

4.10.2 Relevant legal provisions

The SES legal provisions related to the "NSA level cooperation" benchmarking criterion are summarised below:

- Article 2(3), EU Regulation 550/2004: the Member States are required to *"conclude an agreement on the supervision...with regard to the air navigation service providers providing services relating to those blocks"*.
- Article 4(2), Commission Regulation 1034/2011: the NSA cooperation agreement concluded in the FAB context has to identify and allocate the responsibilities for safety oversight so as to ensure that:
 - *"(a) specific points of responsibility exist to implement each provision of this Regulation;*
 - *(b) Member States have visibility of the safety oversight mechanisms and their results;*
 - *(c) relevant information exchange is ensured between the overseeing authorities and the certifying authority"*.
- Article 4, Commission Implementing Regulation 390/2013: NSAs are responsible for the development of FAB performance plans as well for the oversight and monitoring of these plans.

4.10.3 Benchmarking

4.10.3.1 NSA cooperation arrangements in terms of the oversight of SES implementation

Our benchmarking assessment for this criterion starts with the assessment of FAB NSA cooperation agreements and their effective implementation in terms of supervision of the application of SES legislation.

In each FAB, there is an NSA cooperation agreement generally covering the following NSA working arrangements: principles and areas of FAB level NSA cooperation, designation and certification of ANSPs, set up of FAB NSA level structures with related committees/working groups and their roles, harmonisation of national rules and procedures, detailed definition of supervisory and performance related tasks, definition of processes and procedures for exchange of information. All the FAB NSA Agreements are aligned with the SES regulatory requirements, which allow a high level of flexibility as to the working arrangements applied between NSAs.

Concerning the oversight and certification arrangements, the general approach in most of the FABs is that the Member State/NSA is responsible for the certification of its territorial ANSP(s). This is not in case within the DK-SE FAB as they have established the joint provider NUAC HB, and the joint certification is performed by both NSAs (although the certificate is formally granted and overseen by the Swedish NSA). Initial joint certification and recertification in DK-SE FAB includes the coordination, planning and conduct of audits for all the NUAC activities. In other FABs it is the territorial NSA who is

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

handling the ANSP certification process, and the information about the certification and designation is shared through the relevant FAB NSA structures.

The NSAs have to ensure a framework for appropriate supervision of the ANSPs within the FAB and organise proper inspections and surveys to verify compliance with the SES requirements, including human resources assessment.

As there is no common ATS provider except within the DK-SE FAB, the supervision arrangements covering the FAB related activities are mainly based on the principle that the territorial NSA takes the lead in performing the audit of its ANSPs, whereas the other NSAs may participate as observer. The observer status is due to the fact that national rules and procedures do not recognise the possibility that an NSA Inspector from another State/NSA can officially sign a report or finding in the name of that State/NSA.

The process and procedure for setting up a joint audit is described in all the FAB NSA agreements. The exchange of NSA annual audit plans, audit schedules, audit reports is usually performed on a Working Group level or through the NSA FAB Council/Committee.

The benchmarking results for this sub-criterion are reflected through the standard scoring scale of the study and should be read as follows:

- FABs who have a formal agreement on the supervision and safety oversight arrangements but have not achieved any concrete results in the implementation of the possible options are awarded one point (●).
- FABs who have a formal agreement on the supervision and safety oversight arrangements and are conducting national audits with the possibility of sharing the safety oversight results with other FAB member states get two points (●●).
- A three points score (●●●) is awarded to FABs having a formal agreement on the supervision and safety oversight arrangements and which are conducting joint oversight activities and sharing audit results.

The table below provides the FAB-specific appraisal concerning this sub-criterion.

Table 31 NSA cooperation arrangements in terms of the oversight of SES implementation - appraisal per FAB

FAB	NSA cooperation in terms of SES oversight	Score
BALTIC	The BALTIC FAB NSA Agreement covers the procedures and conditions for NSA cooperation. It foresees harmonised procedures for reporting, exchange and dissemination of safety-related information. The territorial NSA is responsible for ANS certification and oversight, with the possibility for each NSA to take part as observer in the other NSA's audit activities as necessary. The finding classification is being harmonised and procedures on the ongoing oversight is being exchanged.	●●

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

FAB	NSA cooperation in terms of SES oversight	Score
BLUE MED	<i>According to the NSA Agreement, each NSA has the responsibility for the oversight of the ANSPs that it has certified. There was no additional data provided that could validate the further NSA FAB developments within this benchmark criterion.</i>	●
DANUBE	The DANUBE FAB NSA Memorandum of Understanding covers the cooperation arrangements in terms of supervision activities and processes related to ATM/ANS provided to general air traffic. In the context of DANUBE FAB, the oversight is conducted by the territorial NSA with the possible participation of the other NSA as observer. Certification and designation is a national process and remains under the responsibility of the territorial NSA.	●●
DK-SE FAB	<p>The DK-SE FAB NSA Agreement covers the principles of the oversight of the DK-SE FAB, oversight of NUAC HB (en route ANSP in DK-SE FAB) and the rights and obligations of the NSAs in terms of satisfying the regulatory requirements.</p> <p>The NSAs have conducted joint certification and oversight of the common service provider, NUAC HB, including coordination, planning and conduct of audits. Formally speaking, NUAC HG was certified by the Swedish CAA as its HQ are located in Sweden. In the process of the Initial certification and recertification of NUAC HB, both NSAs were participating with the same rights and powers. Both NSAs (coordinating through the FAB Safety Oversight Group) are conducting oversight activities of common service provider NUAC HB, common Training organisation (EPN) and cross border services.</p> <p>On national level, the territorial NSA may invite inspectors from the other NSA to participate under the observer status.</p>	●●●
FAB CE	<p>The FAB CE NSA Agreement aims at achieving the harmonisation of national rules, defining the NSA procedures and conditions under FAB Agreement and establishing harmonised procedures for reporting, exchange and dissemination of safety related information.</p> <p>In FAB CE, each NSA is responsible for the certification and designation of its territorial ANSP. Each NSA has a right to request participation as an observer in the common inspection programme.</p>	●●
FABEC	The Memorandum of Cooperation (MoC) between FABEC NSAs defines the key principles and areas regarding NSA cooperation within FABEC and the main platform for NSA cooperation is the NSA Committee (NSAC). The certification and oversight of service providers is conducted by the individual NSA of the Member State concerned.	●●●

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

FAB	NSA cooperation in terms of SES oversight	Score
	FABEC has created a market where NSAs can ask or offer audit expertise for a specific audit at national level. There is a FABEC audit coordinator and national audit coordinators. Until now there has been only one FABEC wide audit (of a training organisation in charge of the FABEC basic initial training).	
NEFAB	The NEFAB NSA Agreement sets out the principles and provisions governing the NSA cooperation between NEFAB NSAs. Currently there is no common certification process established, as in most of the other FABs, and certification of ANSPs remains the responsibility of each NSA. NSAs can participate as observers but the certifying NSA has the right of conducting an audit of its certified ANSP. NEFAB has created a procedure for common audit.	○○
SW FAB	The SW FAB NSA Agreement sets out the principles and provision governing the NSA cooperation between SW NSAs. The SW FAB Cooperation is being developed under the umbrella of the Supervisory Authorities Committee. Joint inspections are carried out in SW FAB whereas one or more members of the “non-certifying” NSA’s staff are appointed and are part of the oversight team as observer(s). Joint inspections are routinely carried out by the civil NSAs. Audit cooperation between the main NSAs in 2016 included 3 inspections. The plan is to have at least two Joint SW FAB inspections annually. Cooperation also includes the sharing of audit schedule, audit plans and audit results.	○○○
UK-IRL FAB	<p>The Memorandum of Cooperation (MoC) between UK-Ireland FAB NSAs defines the key principles and areas regarding NSA cooperation within UK-Ireland FAB and the main platform for NSA cooperation is the FAB Supervisory Committee.</p> <p>There are two levels of oversight. One level is on FAB level concerning the changes to the operation of the FAB where NSAs together review the submitted changes to the operation of the FAB, and prepare a common view on the specific FAB issue. Another level is where each territorial NSA is performing audits of its ANSPs with the possibility of having inspectors from another NSA taking part as observers. There is a process of sharing audit schedule and possible findings. The one NSA can adjust its audit plan according to the issues raised by the other NSA during its audit process. Both NSAs have mature and aligned oversight philosophy and processes (e.g. performance based oversight approach).</p>	○○○

4.10.3.2 NSA harmonisation of activities and sharing of resources

In terms of harmonisation of the NSA manuals, the principle applied by some of the FABs (FABEC, UK-Ireland, DANUBE, SW FAB) is that the procedures covering the NSA activities relating to FAB dimension are being harmonised through a set of common FAB

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

procedures/common guidance document rather through the development of a comprehensive, common NSA Manual. The harmonisation of procedures is mainly being developed on the NSA Committee level and in the framework of the specific NSA Working Groups.

The harmonisation of NSA inspector qualifications and training on FAB level is being performed in a manner where each territorial NSA in a FAB is responsible for the development of an "in-house" inspector qualification and training framework, whereas the other NSA(s) within that FAB recognises the acquired qualifications and competencies.

The sharing of resources in some of the FABs is performed through a "pool of NSA experts" or through the work of specific Working Groups, while one FAB has a specific mechanism for audit coordination ensuring the efficient allocation of experts on the selected aspects of the NSA FAB activities.

The scoring of FABs for this sub-criterion is based on the observed level of harmonisation and resource sharing between the FAB NSAs, i.e.:

- One point (●) corresponds to a low level of harmonisation and resource sharing, which entails that substantial efforts are needed to further enhance cooperation;
- Two points (●●) points to a moderate level of progress and entails that the NSAs should take further steps to achieve the full potential of cooperation;
- Three points (●●●) indicate that NSAs have made good progress in respect of harmonisation and resource sharing. The NSAs concerned should ensure that the good level of cooperation is maintained and that new opportunities for harmonisation and resource sharing are exploited in the course of FAB development.

The table below presents the FAB-specific analysis regarding the harmonisation of activities and the sharing of resources at NSA level.

Table 32 NSA harmonisation of activities and sharing of resources - appraisal per FAB

FAB	NSA harmonisation of activities and sharing of resources	Score
BALTIC	<p>There is no harmonisation of the NSA manuals for the time being, but this activity is planned.</p> <p>Concerning the sharing of resources, the BALTIC FAB reports that it has established a pool of NSA experts. Each NSA is entitled to make use of the expertise of any listed expert to support its supervisory activities, in a manner consistent with its national rules.</p>	●●
BLUE MED	<p>Due to the lack of validated data sources, data concerning the harmonisation of manuals, inspector qualifications and training as well as the sharing of resources could not be analysed.</p>	●

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

FAB	NSA harmonisation of activities and sharing of resources	Score
DANUBE	<p>Currently, there is no FAB NSA handbook. An NSA procedure expert group exists. Its main task is the harmonisation of procedures by the two NSAs. There is a common plan for each year regarding the harmonisation of activities.</p> <p>NSA pool of experts is not established but the NSA Inspectors are being used as observers on joint audits and there is a possibility for secondment of experts between NSAs. The harmonisation of inspector training and qualification requirements is being considered.</p>	○
DK-SE FAB	<p>There is no common NSA manual as historically the NSAs are sharing resources, knowledge and experience and other relevant documentation. The FAB Board can make ad hoc decisions on the sharing of resources and expertise based on identified actual needs within each NSA. The harmonisation of inspector training requirements is being performed through the attendance of EUROCONTROL IANS courses. Each NSA recognises the competencies of experts coming from other NSA.</p>	○○○
FAB CE	<p>The exchange of information is performed through the NSA CC and through the Working Groups. The harmonisation of the NSA Handbooks is underway. An assessment of human resources was performed on FAB CE level.</p>	○○
FABEC	<p>FABEC has developed a methodology through which it identifies common oversight activities rather harmonises the national manuals. However, it has to be noted that national NSA manuals and procedures have to be in line with the common FABEC procedures. There is a "Manual" for the Common Activities of the FABEC NSAs, which sets out methodologies and procedures facilitating and harmonising the NSA work at FABEC level. The harmonisation of NSA inspector qualifications/training requirements specific for the execution of audits is defined in the FABEC common manual.</p>	○○○
NEFAB	<p>Even though each NSA has its own national manual, NEFAB has created a common NSA Handbook. In terms of harmonisation of the NSA Inspectors qualifications and training, basic principles are being established, but the principle is that each NSA is responsible for the qualifications and competency of their own personnel. The common reference for training harmonisation are EUROCONTROL IANS courses. The sharing of resources is being actively explored through the activities of different working groups.</p>	○○○
SW FAB	<p>NSA manuals and procedures are being harmonised through the work of the Harmonisation Working Group. The objective is to have a common NSA Handbook within the SW FAB. The SW FAB currently has Procedures for Safety Oversight of ANSPs and MET SPs and a Procedure for the joint review of</p>	○○

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

FAB	NSA harmonisation of activities and sharing of resources	Score
	<p>changes related to FAB SW. These will be incorporated in the new SW FAB NSA Handbook.</p> <p>Each NSA currently has its own training framework for inspectors, but a common training framework is being considered and related work is ongoing. Resource sharing is being performed on all levels of NSA cooperation in the context of four standing working groups of the SAC and in the SAC itself).</p>	
UK-IRL FAB	<p>As regards the harmonisation of NSA manuals at FAB level, there is a FAB NSA Harmonisation Working Group which develops and documents FAB NSA cooperation processes ("UK/Ireland FAB NSA Cooperation Process"). This covers the NSA aspect of FAB operational processes that are driven by ANSPs. Further developments of the UK-Ireland FAB NSA Cooperation Process are driven through the close relationship of the FSC (NSAs) and FAB Management Board (ANSPs). Each NSA is responsible for ensuring that the qualifications of its inspectors match the SES and EASA requirements.</p>	●●●

4.10.3.3 NSA processes for performance scheme implementation

The FAB level processes for implementing the SES performance scheme are similar in most of the FABs. The FABs have set up Working Groups and/or procedures for the development and monitoring of the FAB performance plans.

The development of performance plans in all of the FABs starts at the national level where all the NSAs collect the relevant data and develop reference values for the KPIs and PIs. The joint development of the FAB Performance plan consists mainly of the aggregation of the national efforts through the work of a specific "Performance Working Group" or a set of meetings of another relevant NSA body. All the FAB Performance plans are subject to the approval of high level FAB governance structures.

Our benchmarking assessment regarding NSA processes for the SES performance scheme implementation is based on expert judgment, reflecting the information available to the study team and the observed efforts of FAB NSAs to apply a joint approach to FAB performance planning.

The FABs which developed performance plans mainly based on individual NSA contributions aggregated at FAB level are awarded two points (●●). Three points (●●●) are awarded to FABs which NSAs defined and applied joint working arrangements and processes to FAB performance planning. A one-point score (●) for this sub-criterion reflects either a FAB performance planning process inconsistent with regulatory principles, or the unavailability of information on the applied arrangements.

The following table provides the FAB-specific appraisal regarding this sub-criterion.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Table 33 NSA processes for performance scheme implementation - appraisal per FAB

FAB	Process for FAB level performance scheme implementation	Score
BALTIC	<p>The Baltic FAB Performance Plan is developed by the Lithuanian and Polish NSAs. The joint performance plan development and performance monitoring and target achievement is the responsibility of the Baltic FAB Strategic, Economic and Performance Committee (SEPC).</p> <p>The FAB Performance Plan is approved by the BALTIC FAB Board. As the FAB Board includes the ANSPs as formal decision makers, this is not in line with the requirement to ensure impartial SES performance scheme implementation.</p>	○
BLUE MED	Due to the lack of validated data sources, data concerning the NSA level process for the implementation of the performance scheme could not be analysed.	○
DANUBE	<p>The Performance Plan development, as a first step, is done at local/national level where each NSA inserts the data pertaining to their respective State. The aggregation of data is then done by the FAB Focal point within the Romanian NSA. As an amendment to the FAB Performance Plan, the DANUBE FAB has been requested to develop a common FAB level incentive scheme in order to replace the currently proposed national schemes.</p> <p>The FAB Performance Plan is approved by the DANUBE FAB Governing Council. As the FAB Council includes the ANSPs as formal decision makers, this is not in line with the requirement to ensure impartial SES performance scheme implementation.</p>	○
DK-SE FAB	Tasks relating to the DK-SE FAB Performance Plan are carried out by the FAB "Performance/Charging Working Group". The FAB Performance plan part concerning the cost-efficiency KPA was developed on national level and then merged on FAB level, while all other relevant parts were developed under the "umbrella" of the Performance/Charging Group.	○○○
FAB CE	The FAB Performance plan is developed as an aggregation of the national efforts and values. The aggregation of national data is being performed on the PRWG level and signed by the NSA/CAA or Ministry level and sent by the FAB Performance Body to the Commission.	○○
FABEC	With regard to the FAB performance planning and monitoring tasks, the NSAC is responsible for the safety performance aspects, whilst the Financial and Performance Committee is managing the other key performance areas and the overall FABEC coordination on performance. Furthermore, the NSAC has established a dedicated task force liaising with ANSP-level structures concerning the performance scheme domain.	○○○
NEFAB	The RP2 FAB Performance Plan was developed jointly under the coordination of NSA Finland (Trafi). However, the ANSP	○○○

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

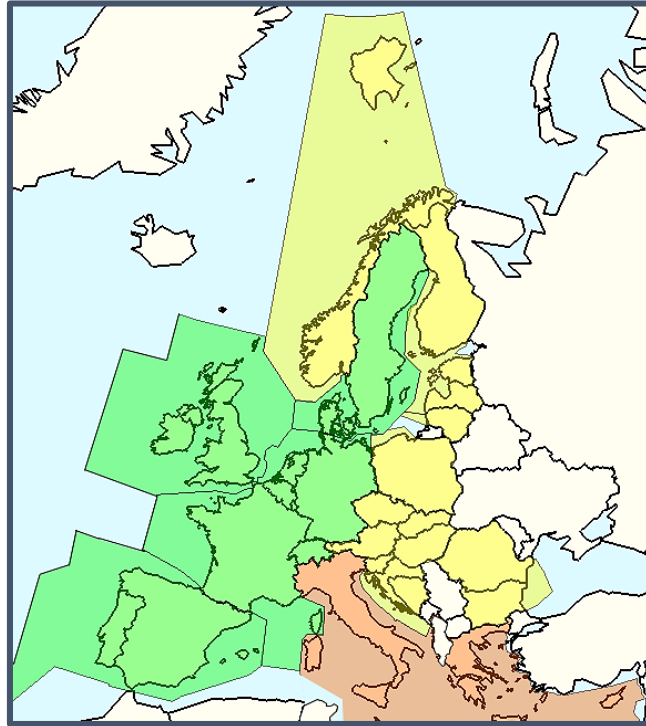
FAB	Process for FAB level performance scheme implementation	Score
	investments as such are approved by each individual NSA (there is no joint review or approval of ANSP investments).	
SW FAB	The Performance plan development is managed by the Performance Working Group (PER WG) in accordance with its Terms of Reference. The preparation of target values still very much takes place at national level. The compiling of the SW FAB PP at FAB level starts within the Performance WG, which produces a draft to be endorsed by the SAC. The final adoption takes place at the SW FAB Council level. The PER WG does not deal with the approval of ANSP investments within the FAB.	●●
UK-IRL FAB	<p>In the UK- Ireland FAB, there is a Working Group which ensures interaction between the ANSP and NSAs to guide the development of the FAB Performance Plan and monitor its outcome and outturn.</p> <p>The development of the FAB Performance plan starts at national level where the States initially define the SES KPI targets. On the FAB level, each State brings its own draft performance plan and then after a few meetings and iterations both plans are compiled into one FAB Performance plan. The completion of the FAB Performance Plan is however more than an administrative exercise of merging the national plans: there are also adjustments made to the plan through the FAB level process.</p>	●●

4.10.4 Overview of results

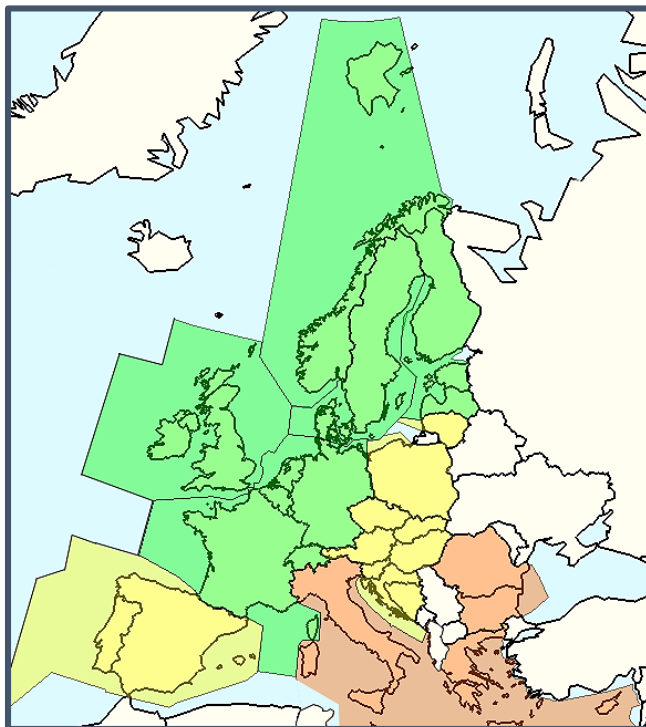
The maps below display the overall results of the benchmarking analysis for the “NSA cooperation” criterion.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

**Figure 67 NSA cooperation in terms of supervision of the application of the SES legislation -
Overview of benchmarking results per FAB**

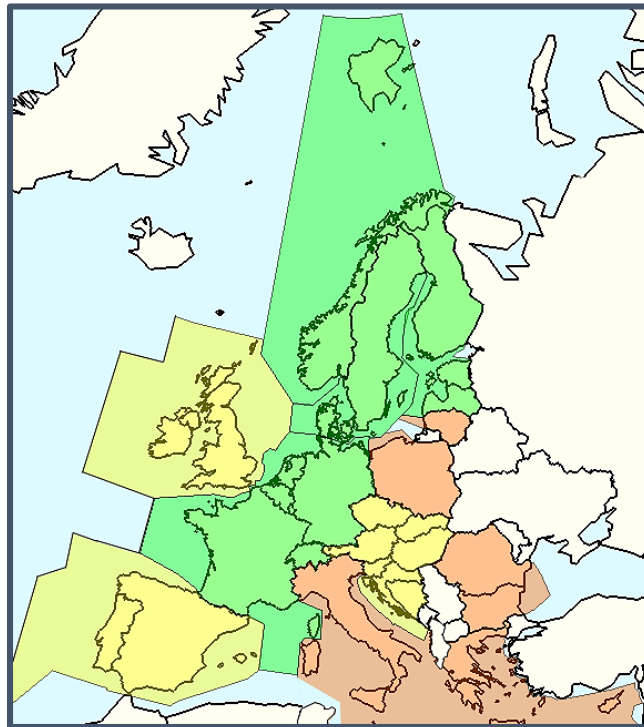


**Figure 68 NSA harmonisation of activities and sharing of resources- Overview of
benchmarking results per FAB**



**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

Figure 69 NSA processes for FAB level Performance scheme implementation- Overview of benchmarking results per FAB



4.10.5 Best practices

The identified best practices (already implemented by FABs) relating to FAB NSA cooperation and coordination are summarised in the table below:

Table 34 Identified best practices - NSA cooperation

<i>Component</i>	<i>Best practices</i>
NSA cooperation arrangements and their effective implementation in terms of supervision of SES	<ul style="list-style-type: none"> • Joint oversight performed by NSA experts with the same level of responsibility and accountability • Common Audit coordinator ensuring the expertise needed for a specific supervisory activity • Exchange of audit schedules, audit plans and findings and audit reports
Harmonisation of activities and sharing of resources	<ul style="list-style-type: none"> • Creation of a common NSA Manual or set of common FAB procedures/common guidance document • Harmonisation of procedures and processes is performed through Working group levels – bottom-up – by identifying the needs for harmonisation • Sharing of resources used for supervisory tasks through the “pool of experts” mechanism or through Audit Coordinator on a FAB level

<i>Component</i>	<i>Best practices</i>
Process for FAB Performance scheme implementation	<ul style="list-style-type: none"> FAB Performance plan sections/targets relating to FAB values being jointly developed on the FAB level, based on a truly FAB level approach agreed by NSAs

4.10.6 Recommendations

- All of the FABs have foreseen the option of joint NSA oversight activities within their FAB NSA Agreement. Joint oversight though common FAB-specific audits should be encouraged in order to promote a harmonised approach and foster the exchange of knowledge and experience. It has to be acknowledged that the participation of another NSA in the oversight of territorial/certifying NSA might be limited to the observer status, due to the national legal limitations.
- The existing national NSA procedures linked with FAB related matters should be shared among all NSAs in order to achieve greater level of transparency and to drive the harmonisation of NSA procedures and processes at FAB level. The harmonisation of NSA FAB related procedures and processes depends on the FAB approach. The bottom-up approach (through the existing Working Groups) could be considered for identifying FAB specific processes to be harmonised on FAB level. All the relevant documentation could be stored through a common web tool in order to ensure availability and traceability.
- In most of the FABs, the NSAs recognise the competencies of the experts coming from another NSA within their FAB. The harmonisation of the qualifications and training requirements in some of the FABs is achieved through documents listing the number and the topics of the courses that each inspector should attend in order to be recognised as a qualified and competent expert. This process is linked with the establishment of the NSA pools of experts. In order to ensure a harmonised approach on a FAB level, NSAs should consider identifying the relevant inspector training requirements (a list of courses needed per specific NSA domain) and qualifications (other additional competences). This would be a living document that could be updated on FAB level, depending on the new FAB NSA activities identified.
- Concerning the sharing of resources, FABs should try to focus on the development of the NSA pool of expert mechanisms, through the existing cooperation arrangements. The NSA pool of experts is one of the most valuable tools for ensuring a harmonised approach for the NSA FAB related tasks. In order to ensure the implementation of the NSA pool of experts, the supporting procedures and processes have to be harmonised at FAB level.
- Performance plan development is regulated through the SES regulatory framework. Even though all the targets except for the cost-efficiency KPI are expected to be defined on a FAB level, FAB Performance plan development is mainly based on a working phase at national level and then merging national inputs into one document on FAB level. FABs should consider strengthening the FAB level processes for performance planning, i.e. by agreeing on more ambitious NSA working

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

arrangements focusing on the development of the Performance plan on FAB level. The process for FAB performance planning should not be based on the sole aggregation of values and contributions produced at national level.

4.11 Development of FAB common charging zone

4.11.1 Definition of benchmarking criterion

This criterion is to assess whether FABs have developed common charging zones that deliver operational and/or environmental improvements. Article 5(4) of IR 391/2013 (The Charging regulation) states that "where charging zones extend across the airspace of more than one Member State, the Member States concerned shall ensure consistency and uniformity in the application of this Regulation to the airspace concerned." However, there is no formal requirement to develop common charging zones in the relevant Regulations.

In a recent study commissioned by DG MOVE, it was found that indicatively the benefits from introducing a common charging zone at FAB level to improve flight efficiency could amount to € 70-140 million per annum for the entire SES area in terms of reduced fuel burn, plus additionally the benefits from reduced CO₂ emissions²⁵⁸. Potential benefits are primarily identified in those FABs that have the largest differences in unit rates. The same study also describes extensively the disadvantages in terms of financial implications for individual ANSPs as a result of traffic shifts. There is also a significant complexity and many hurdles to overcome to implement common charging zones at FAB level, such as the differences in cost bases, currencies applied, number of States involved per FAB etc. All these barriers are recognised by the study team. However, if FABs should contribute to improve performance of EU ATM in the SES area, the introduction of a common charging zone at FAB level is likely to support the achievement of horizontal flight efficiency targets in those FABs with a wide spread in the unit rates. This is the rationale for including this criterion in the set of benchmarks.

4.11.2 Relevant legal provisions

The establishment of common charging zones in the FAB context is at the discretion of Member States: this is an option enabled by the SES Charging Regulation (391/2013), but it does not constitute a legal obligation.

Article 5(4) of Commission Implementing Regulation 391/2013 states that "where charging zones extend across the airspace of more than one Member State, the Member States concerned shall ensure consistency and uniformity in the application of this Regulation to the airspace concerned."

²⁵⁸ SDG, Policy options for the modulation of charges in the Single European Sky | Final report, April 2015.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

4.11.3 Benchmarking

As described in chapter 2, none of the FABs has introduced to date a common charging zone. As a result, each of the FABs received the lowest score on this criterion. In our consultations, close to all FABs expressed that they do not see sufficient benefits for a common charging zone when compared to the costs and disadvantages to set this up. The exception in this is FAB CE that indicated that there is a strong will to continue the feasibility assessment of this initiative in 2017.

Although none of the FABs established a common charging zone, one could analyse whether the current differences between unit rates in the different charging zones of a FAB are small or large. Small differences in unit rates would be similar to a common charging zone. This is presented in the table below. For each state in a FAB the en-route determined unit rate is presented (2015 value). In the last column we have included the difference between the highest and lowest rate in a FAB.

Table 35 Dispersion of unit rates within FABs

FAB	State	En-route unit rate²⁵⁹	Dispersion
Baltic FAB	Lithuania	44,99	11,77 %
	Poland	33,22	
BLUE MED FAB	Cyprus	33,66	54,29 %
	Greece	36,11	
	Italy	80,17	
	Malta	25,88	
DANUBE FAB	Bulgaria	22,68	13,50 %
	Romania	36,18	
DK-SE FAB	Denmark	61,93	2,97 %
	Sweden	58,96	
FAB CE	Austria	73,72	38,40 %
	Croatia	47,85	
	Czech Republic	43,07	
	Hungary	35,32	
	Slovakia	52,63	
	Slovenia	65,47	

²⁵⁹ CRCO, <http://www.eurocontrol.int/sites/default/files/content/documents/route-charges/unit-rates-and-tariffs/ur-2016-12.pdf>

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

FAB	State	En-route unit rate²⁵⁹	Dispersion
FABEC	Belgium-Luxembourg	65,50	38,83 %
	France	67,63	
	Germany	82,68	
	Netherlands	67,09	
	Switzerland	105,92	
NEFAB	Estonia	30,69	28,92 %
	Finland	56,32	
	Latvia	27,40	
	Norway	42,13	
South West FAB	Portugal Continental	39,99	31,79 %
	Spain Canarias	58,45	
	Spain Continental	71,78	
UK-Ireland FAB	Ireland	29,76	54,41 %
	United Kingdom	84,17	

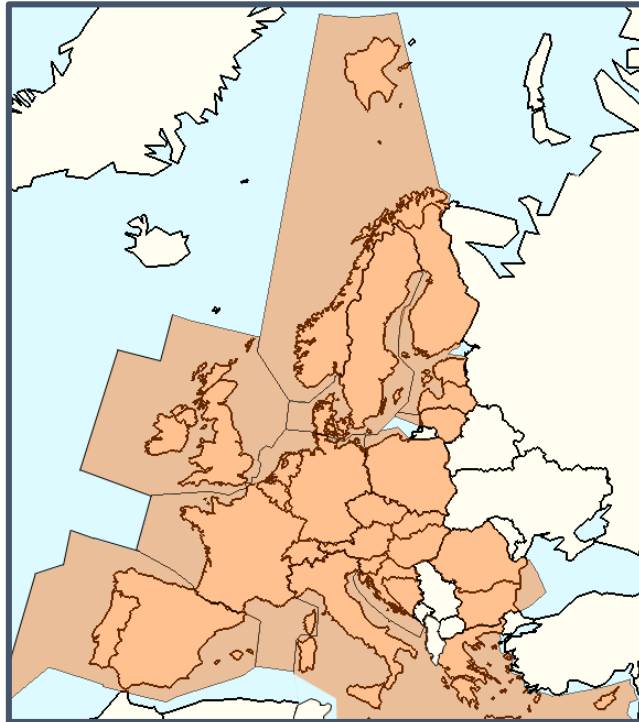
From the table it becomes clear that only for two FABs, DK-SE and Danube, the difference in en-route unit rate between the State with the highest rate and with the lowest rate are relatively small. For all others, the unit rate dispersion is significant and far from one common charging rate.

4.11.4 Overview of results

The map below displays the overall results of the benchmarking analysis for the "development of FAB charging zone" criterion.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

Figure 70 Development of FAB charging zone – Overview of benchmarking results per FAB



4.11.5 Best practices

There are no existing best practices (already implemented by FABs) implemented in respect of this benchmarking criterion.

4.11.6 Recommendations

In the SDG study the potential of a common charging zone has been sketched. Such a principle could result in significant overall annual benefits in terms of reduced fuel burn and CO₂ emissions. At the same time, the barriers to implement such common charging zones are also large. From our consultations it seems that many FABs stopped studying the concept after the publication of the SDG report, being scared off by the complexity and potential impact on individual ANSPs. However, the concept could also be seen as a driver towards further integrated service provision. It is therefore recommended that further *integrated* research is carried out, including the costs and benefits of the concept for the SES area as a whole, for individual FABs and the impacts of a common charging zone on each of the four KPAs in the performance scheme.

4.12 FABs' contribution to SES policy areas

4.12.1 Introduction

The study terms of reference required the FABs' contribution to the following SES policy areas to be evaluated as part of the study:

- network development, including optimised airspace organisation and use;

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- improved performance, including interoperability requirements;
- implementation of the SESAR Deployment Programme;
- more-optimised air navigation services in SES.

These aspects are linked to the SES regulations and our benchmarking analysis as outlined in the following table:

Component²⁶⁰	Relevant legal provisions	Related benchmarking criteria
Network development, including optimised airspace organisation and use	Art. 2(25), EU Regulation 549/2004 Art. 9a(2)(b),(c),(e) and (f), EU Regulation 550/2004 Commission Regulation 677/2011	Network integration and support to network level operations FAB geographic and operational scale Optimised operations and consolidation
Improved performance, including interoperability requirements More optimised air navigation services in SES	Art. 2(25), EU Regulation 549/2004 Art. 9a(2)(b) and (d), EU Regulation 550/2004 Commission Implementing Regulation 390/2013 Commission Implementing Regulation 391/2013	Optimised operations and consolidation Technical harmonisation and rationalisation FAB geographic and operational scale Scope of FAB activities FAB business planning and development ²⁶¹ Development of FAB common charging zone ²⁶²
Implementation of the SESAR Deployment Programme	Commission Implementing Regulation 409/2013 ²⁶³ Commission Implementing Regulation 716/2014 ²⁶⁴	Technical harmonisation and rationalisation

In the following sub-sections, we summarise the findings from the benchmarking analysis in respect of these four areas.

²⁶⁰ SES policy components identified in the study's Terms of Reference as essential aspects for FABs. For the sake of clarity, the components relating to "improved performance" and "more optimised air navigation services" are combined in the table.

²⁶¹ Not an explicit legal requirement, but considered by the study team as a necessary tool for ensuring effective overall FAB implementation.

²⁶² Option for Member States, enabled by Commission Implementing Regulation 391/2013.

²⁶³ Commission Regulation 409/2013 does not contain FAB related legal obligations. Article 9(3) of this regulation allows the participation of operational stakeholders in the deployment manager "through FAB structures", whilst recital nr 21 (only interpretative legal value) stipulates that "As far as possible, synergies shall be sought between SESAR deployment and Functional Airspace Blocks (FABs)".

²⁶⁴ Commission Regulation 716/2014 does not contain FAB related legal obligations.

4.12.2 **Network development, including optimised airspace organisation and use**

Commission Regulation (EU) No 677/2011 establishes the Network Manager function and provides the basis for cooperation and coordination between the Network Manager, Member States and FAB. The State interface is at an operational or tactical level. At a strategic or policy level, the State interface is through the FAB. Member States are also required to formulate consolidated views at FAB level, including as regards to operational issues. The Regulation requires the Network Manager to maintain a Network Strategy Plan and Network Operations Plan which details how FABs will work with the Network Manager in implementing airspace and route design at a FAB and ANSP level. The Network Manager provides coordination as well as technical and operational support for the implementation of these plans.

Consistently with the Regulation, the FABs maintain representation at Network Management Board level. FABs, through their constituent states, also support the implementation of the Network Strategy and Operations Plans. Thus, from a compliance perspective, FABs are meeting the requirements of the Regulation. There are also FAB initiatives targeting cross-border optimisation undertaken. Whilst FAB reports cover initiatives to improve capacity and efficiency, these tend to be initiatives of individual members, rather than at the FAB level.

At a FAB level the most notable network achievement is in respect of implementation of direct routes and various stages of Free Route Airspace (FRA), planned and implemented through the European Route Network Improvement Plan (ERNIP) and the Network Operations Plan (following the Strategic Objectives and Targets set in the Network Strategic Plan and in the Network Manager Performance Plan and the mandate provided under Regulation 716/2014). However, for effective free route airspace, the military dimension remains an impediment, which is why Free Route Airspace is coupled with A-FUA in Regulation 716/2014. There is limited evidence of significant progress on A-FUA (section 3.2.3.2), which suffers from constraints due to sovereignty and the limited effect of regulations on the military, which are matters that are beyond the FAB to resolve.

From the survey 33% of respondents believe FABs do not actively engage with the Network Manager on all aspects of their planning, implementation and performance (section 3.2.1.5). The survey also shows that only 31% of respondents believe that fragmentation has been reduced by FABs (section 3.2.3.1). The benchmarking analysis criterion 4, see 4.3.6) also indicates only a limited score for all FABs on the best practice 'Coordination with NM on airspace improvements'.

The reality is that decision-making on airspace issues remains at state level not FAB level, with states not devolving decisions impacting their airspace to the FAB. The state level (and more specifically the ANSP level) is where the operational interface exists, thus the Network Manager and individual ANSPs will have a direct relationship to avoid the process complexity associated with working through the FAB. Hence, in terms of network performance, more progress is made through state initiatives rather than FAB-driven efforts.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

4.12.3 Improved performance, including interoperability requirements

FABs are seen as a key element in achieving the Single European Sky objectives of improving the overall efficiency of air navigation services across the key performance areas of safety, environment, capacity and cost-efficiency, in line with the Performance Framework of the European Air Traffic Management (ATM) Master Plan.

In terms of the specific requirements of Commission Regulation (EU) No 390/2013, all FABs produced performance plans for RP2. There is however no clear evidence that these plans are other than a simple aggregation of individual member state plans and reporting is likewise a consolidation of individual state outcomes as opposed to being delivered by a FAB. The reality is that none of the KPAs are directly managed by FABs and the FAB influence on these is minimal at best. As such, as a mechanism for contribution to improving performance, the FAB performance plans do not appear to be effective.

In Reference Period 1 (RP1), performance in all 4 KPAs measurably improved, although in the context of lower traffic levels than planned in the National Performance Plans. However, the targets were not fully met. Concerning each KPA in turn:

- Safety - There were no targets set for RP1. For RP2 severity classification and safety culture targets are in place. There is limited evidence of a FAB approach evident in the safety dimension, possibly reflecting that these safety process outcomes can only be delivered on a State by State basis, with safety culture being dependent on national laws. Accordingly our analysis shows that the FAB contribution to improved safety performance is largely in the form of exchange of information and best practice, with some FABs aligning safety manuals. Stakeholders also confirmed this in our survey (see section 3.2.3.6.), where more than 70% of the respondents answered that safety levels have remained the same on our question to what extent FABs have affected current safety levels.
- Capacity - The European level capacity KPI target - ATFM delay - was not achieved due to a handful of states not meeting their national targets. Investment in capacity is very much a trade-off against cost-efficiency, thus something that is determined at state rather than FAB level. ATM capacity constraints are localised and limited to a small number of states. Whilst there are some examples of neighbouring states who may or may not be in a common FAB assisting with capacity issues, for example Ukraine airspace closure, the FAB contribution to capacity appears limited. As with safety, the FAB has very little ability to influence this performance measure. The benchmarking analysis in section 4.4. also reveals that even in their planning approach, the FAB plans are high level and conceptual and address only to a limited extent the best practices that would impact capacity.
- Environment - measured through horizontal enroute flight efficiency, this indicator improved during RP1 but not enough to meet the EU level target. The degree of control of ANSPs over this target is limited as routings are subject to airline flight planning and ATFM flight extensions, which may be beyond the control of the individual ANSPs. FABs' influence on this measure will be limited to the environmental

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

benefits flowing from the Direct Routing / FRA implementations, but as we have indicated in section 4.5.3, many FRA projects are not FAB initiatives.

- Cost efficiency - Cost-efficiency within the Single European Sky area has improved over RP1 in real terms, despite the actual level of the en route unit costs at Union level being higher than SSC targets throughout RP1. A significant factor impacting achievement of cost efficiency was the deferment of capital expenditure, over which FABs have no control. Additionally, the benchmarking analysis in section 4.7.3 indicates that only a relatively limited number of best practices in terms of technical harmonisation and rationalisation, which would result in cost reductions, have been implemented by the FABs.

Overall, whilst FABs comply with the legal requirements of Commission Regulation (EU) No 390/2013, their contribution to performance is limited and has not been a determinant of success or failure in achieving the SES targets.

4.12.4 Implementation of the SESAR Deployment Programme

Commission Implementing Regulation (EU) No 409/2013 sets out requirements for the definition and governance of Common Projects to deliver the essential ATM functionalities in the ATM Master Plan. Commission Implementing Regulation (EU) 716/2014 makes binding the implementation of the first six ATM functionalities, constituting the first Common Project, referred to as the 'Pilot Common Project' (PCP). The objective of the common project is to deploy in a timely, coordinated and synchronised way, ATM functionalities that are required to deliver the operational changes identified in the European ATM Master Plan.

The FABs have no role in SESAR and the PCP and Regulation No 716/2014 makes no reference to FABs. Regulation No 409/2013 makes two references to FABs: "*As far as possible, synergies shall be sought between SESAR deployment and Functional Airspace Blocks (FABs)*" and "*Operational stakeholders may participate in the deployment manager through FAB structures.*" Deployment of SESAR is managed by the SESAR Deployment Manager (SDM). There are no FABs in the SESAR Deployment Manager but 'Alliances' dominated by the larger ANSPs. FABs are not provided a role in SESAR and the PCP, and accordingly appear not to have contributed anything.

Looking beyond the PCP, FABs have made a very limited contribution in respect of interoperability. Examples of standardisation or at least inter-operable systems driven on a FAB basis are infrequent, with system planning and development continuing to be undertaken on a state basis. The various alliances and industrial partnerships are led by ANSPs towards systems harmonisation, rather than FABs.

4.12.5 More-optimised air navigation services in SES

The FABs provide a structure for helping states and ANSPs in identifying and applying operational improvements through co-operation with other neighbouring states. However, the FABs were founded on the more ambitious concept of seamless management of a block of airspace that extends beyond a single state, without regard

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

to national borders, to achieve the benefits that such an approach would unlock. Whilst the institutional arrangements are in place, these have not, with a few exceptions, translated into the integrated management of the combined FAB airspace as a single entity. Hence the achievements of FABs are substantially limited to ad hoc projects to optimise air navigation services, many of which could have been undertaken regardless of the FAB. Most of the projects have focused on airspace organisation and management, with limited focus on optimisation of the delivery of the service. Thus there has been no rationalisation of capacity or infrastructure based on utilisation of the FAB structure. At best the FAB may be a catalyst for change, but do not appear to be a vehicle for more optimised ANS.

5. Conclusions and recommendations

This chapter sets out the overall conclusions of the study as well as recommendations addressed to the European Commission, FABs and/or Member States.

5.1 Conclusions

5.1.1 General conclusions

1. The SES II package (adopted in 2009) provided a strong impetus to FAB implementation. The related expectations were high: FABs were seen as instrumental for defragmenting the European airspace and generating tangible performance improvements through economies of scale. FABs were envisioned as airspace blocks based on operational requirements and unhindered by State boundaries, which would drive the integration of service provision and the rationalisation of the European ANS industry.
2. Based on the reviewed evidence and the conducted benchmarking analysis, we conclude that FABs have not met the high level policy objectives set by the SES legislation, despite the substantial efforts undertaken for their implementation. There is a widely shared opinion, reflected in the results of our stakeholder survey, that the FABs have not overall reached the set policy expectations. The most critical views were expressed by airspace users, who voiced their strong disappointment with the results of FABs and as regards FAB customer engagement.
3. The implementation of FABs appears to have revolved too much around the aim of ensuring formal, minimal regulatory compliance, whilst efficiency gains have been held back by political, legal and technical impediments. Hence, FABs have not overall generated the benefits foreseen before their implementation. Progress has been particularly slow as regards the rationalisation of services and resource optimisation.
4. In terms of operational cooperation, several FABs have made progress on the implementation of Free Route Airspace. This was identified as the most valuable benefit and achievement of FABs to date by many consulted stakeholders. However, it is our view that this PCP initiative, coordinated by the Network Manager as part of the ERNIP, would probably have progressed irrespective of FAB structures. This is evidenced by lack of alignment of implementation date within some FABs.
5. By and large, there is no strong support among stakeholders to abandon the FAB concept. As our stakeholder survey indicated, the FABs – in their current setting – are not perceived to match the FAB concept defined in the SES legislation. Stakeholders are pointing out a lack of political willingness to move forward and, as a result, major delays and shortcomings in the implementation of FAB initiatives.
6. A large number of stakeholders emphasised that FABs should not be regarded as an end in themselves, but rather as one tool amongst others in improving ANS performance. In parallel with FABs, ANSPs have made progress under the performance scheme and have developed industrial partnerships based on a bottom-up approach.

5.1.2 Conclusions – regulatory and institutional dimensions

7. The decision-making in all FABs is underpinned by the consensus principle. This incontestably entails challenges, in particular for multi-State FABs. For example, a FAB level project may not be endorsed if it does not generate distinct benefits to each FAB member, even if the overall added value of the project for the FAB and the ANS network is clearly demonstrated.
8. The institutional structures in place across the various FABs are largely similar and reflect the State, NSA and ANSP levels of the FAB concept. However, each FAB has its specific institutional characteristics reflecting the FAB focus areas and priorities, the number of countries involved as well as the allocation of responsibilities between the various actors. The multi-State FABs with a higher number of participating States have more complex institutional structures (with more committees, working groups etc.) than the 2-State FABs.
9. One identified key distinction is the role assigned for the CAAs/NSAs in the FAB high-level governance. In the case of two FABs, the CAAs/NSAs have been mandated to act on behalf of their respective Member States within the FAB governance structures. This delegation of power has allowed the CAAs/NSAs to effectively develop the FAB activities from the perspective of technical and operational requirements, in accordance with the mandate given by the States.
10. By contrast, many other FABs have vested their high-level decision-making and governance responsibilities with Ministry-level authorities. This entails that the NSA-level may be involved in the activities of the FAB high-level decision-making body, but with limited influence on decision-making (as member in a larger State delegation) or with observer status only.
11. In most FABs, the ANSP level governance structure is clearly separated from the State and NSA level structures, with appropriate coordination and consultation mechanisms in place between the two dimensions.
12. The typical situation is that the ANSP can also participate as observer in the FAB high-level decision making body. However, in the case of two FABs, we observe that the ANSPs are actually full members of the high-level governing body and take part in the decision-making, which gives rise to possible concerns in the light of the requirement to guarantee the separation (functional, at least) between the service provision and oversight functions.
13. There is a consensus that the close involvement of military stakeholders in the FAB governance structures is essential in order to enable the successful development of FAB activities. However, the conducted stakeholder survey highlighted that the current engagement of military users in the FAB activities needs to be further enhanced, in particular to remove constraints around the flexible use airspace.
14. FABs are finding that the FAB administrative and technical support functions are important enablers for the successful governance and implementation of FABs. The responsibility for this usually lies with the ANSPs who have established “management offices” or “administrative cells”. In one FAB, the established joint provider has its

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

own staff focused on the management of FAB level activities, whilst another FAB is managing its programme activities through a joint legal entity.

15. NSA cooperation was found to be making progress within all the FABs, especially as regards the harmonisation of the NSA procedures and the exchange of information and knowledge (including as regards audit processes and schedules). However, there is still room for improvement and NSAs within many FABs are planning to develop their cooperation further.
16. There are considerable differences between FABs as regards the transparency of FAB activities and in the communication of FABs towards stakeholders. Whilst each FAB has a dedicated website, there are wide differences in the comprehensiveness and quality of the provided information. Only three FABs were found to systematically publish annual activity reports and implementation plans.
17. The airspace user representatives consulted in the framework of this study were not satisfied with the current level of customer engagement within the FABs. Most of the FABs have established an annual consultation mechanism of airspace users in respect of the FAB implementation, but only one FAB has enabled the direct involvement of airspace user representatives in its governance structures.
18. In the majority of FABs, there is a formal setup for FAB level social dialogue. However, in many FABs, social dialogue has been inadequate in practice, as the established mechanisms have been dormant. Only four FABs were found to have a well-functioning, regular social dialogue at FAB level. The added value of an effective FAB level social dialogue was confirmed to the study team by the social partners. However, the FAB level social dialogue is always complementary to the national level social dialogue.

5.1.3 Conclusions – technical and operational dimensions

19. From an operational perspective, there are limitations for FABs that are either small (typically 2-State) or are on the periphery of EU airspace and hence have less traffic to influence through an operational partnership. Furthermore, those FABs with limited traffic flows between States will not necessarily create much greater operational efficiency by grouping together, as there will still remain limited flows between States.
20. The scope of FABs has been examined and may be limiting in respect of excluding TMA and related services and infrastructure. However, it is also the case that FABs who have excluded TMA have cited TMA-related projects in their achievements. This leads the study to conclude that the FABs should simplify their scope by stating that it includes all ANS and related infrastructure and services.
21. The majority of FAB plans are high level and conceptual as opposed to concrete business plans. Without sufficient detail in its business planning it is not clear how the FAB can have confidence that the operational concepts defined will be delivered on. It would also appear to make it difficult for ANSP's individual business plans to incorporate the FAB dimension. Improved FAB business plans would support better

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

stakeholder consultation, providing stakeholders with a means to properly judge and influence FAB plans and progress on an annual basis.

22. FABs are claiming as FAB initiatives developments such as FRA, which is required by the ERNIP (as responsibility for coordination of FRA falls on the Network Manager) and the Pilot Common Project Reg (EU) 716/2014. DCT and FRA are one of the six functionalities mandated by the SESAR Joint Undertaking. However, these are not essentially FAB initiatives as they should have happened anyway, assuming compliance with the regulation and support of ERNIP and European ATM Master Plan (Level 3). It is for this reason that the study has not given in section 2 a long list of projects.
23. In general the FAB plans are more statements of aspiration and articulate short term project goals; they are not a comprehensive road map to a defined point to deliver against the SES targets. Furthermore, the end state is not well articulated.
24. In many instances, the FABs seem to be superseded by Industrial Partnerships, particularly the smaller FABs. Stakeholders have specifically highlighted the results achieved within the BOREALIS and COOPANS alliances. The potential is for these partnerships to address funding and skills limitations in smaller States. Thus these partnerships may become more important than FABs in driving at least technological progress. There is also an issue of FABs having no role in SESAR, leading to the downgrading of influence of FABs; the future role of FABs in the context of the industrial partnerships needs to be further evaluated.
25. The Performance Scheme implementation at FAB level has not led to a truly FAB-level approach: FAB targets are an aggregation of national targets with either no or very limited FAB synergies.
26. Aside from the technology issue, the focus of FABs is almost exclusively on airspace optimisation. There is very little evidence, if any, of FABs driving the attainment of the SES targets, particularly user charges. Hence FABs are not driving a step changing in efficiency and thus costs, even in services such as ATCO training, AIS and MET. So concepts of dynamic sectorisation and consolidation of ACC and removal of duplicated infrastructure and support resources do not currently appear to be part of the equation (aside from UK-IRL where the NOTA existed prior to the FAB anyway).

5.1.4 Conclusions – economic and financial dimensions

27. FAB targets and reporting under the Performance Scheme are based on blending the constituent ANSP performance plans. FABs do not operate or have any form of FAB-wide financial planning or accountability.
28. FABs don't have real business plans. The FAB is seen as an umbrella for some states to undertake projects together – it is not seen to have an economic or financial dimension. Thus the FAB contributions to the SES cost effectiveness targets are a product of project outcomes and individual state initiatives, rather than any financial plan of the FAB.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

29. Economic aspects for each FAB have been assessed on a broad scale. The magnitude of costs and benefits of each of the FABs and their proportionality remain unclear. This is due to several factors:
- It is challenging to quantify the costs and benefits, as they have not been reported uniformly (if at all);
 - The extent to which planned projects have been implemented is not always clear;
 - The administrative costs of FABs remain unclear;
 - It is questionable whether benefits FAB projects can truly be attributed to the creation and/or the development of FABs. These benefits may have been generated also in the absence of FABs.
30. With these caveats in mind, it is likely that projects have been implemented faster, since the FAB framework forced FABs to undertake action. The FABs have identified that benefits have materialised as a result of FABs. Combining the CBAs and ANSP responses to the FAB survey shows that more benefits have been achieved for flight efficiency than for delays. This echoes the response to the stakeholder survey.
31. Only a few FABs have reported on ANSP costs savings in the CBAs; rather they have reported on benefits for users. Most of the CBA have not been updated since they were first produced to meet regulatory requirements in 2012. They are thus not current and not living documents used in managing the FAB.
32. Most projected benefits have not been realized yet in full, due to delays in the implementation of projects.
33. Resource efficiency does not seem to have been the key target for FABs. Instead the focus has been on the implementation of projects that would benefit users and are required under European ATM Master Plan (Level 3) or to support SESAR.
34. FRA seems to have been a key source of achieved benefits. However, the FRA improvements also could probably have been realized without FABs.
35. FABs seem reluctant to move towards a single FAB level charging zone. This corroborates that FABs focus on service quality rather than cost efficiency.

5.2 FABs' contribution to SES policy areas

The study has also evaluated the FABs' contribution to the following specific SES components and related legal requirements (section 4.12). The key findings are outlined below.

5.2.1 Network development, including optimised airspace organisation and use

Our evaluation is that FABs are technically meeting the requirements of Commission Regulation (EU) 677/2011. However, the reality is that decision-making on airspace issues remains at state level not FAB level, with states not devolving decisions impacting their airspace to the FAB. Hence, in terms of network performance, more progress is made through state initiatives rather than FAB-driven efforts.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

5.2.2 **Improved performance, including interoperability requirements**

Overall, whilst FABs formally comply with the legal requirements of Commission Regulation (EU) No 390/2013, their contribution to performance is limited and has not been a determinant of success or failure in achieving the SES targets.

5.2.3 **Implementation of the SESAR Deployment Programme**

FABs are not provided a role in SESAR and the PCP, and accordingly appear not to have contributed anything. Looking beyond the PCP, FABs have made a very limited contribution in respect of interoperability. The various alliances and industrial partnerships are led by ANSPs towards systems harmonisation, rather than FABs.

5.2.4 **More-optimised air navigation services in SES**

The achievements of FABs are substantially limited to ad hoc projects to optimise air navigation services, many of which could have been undertaken regardless of the FAB. Most of the projects have focused on airspace organisation and management, with limited focus on optimisation of the delivery of the service. At best the FABs may be a catalyst for change, but do not appear to be a vehicle for more optimised ANS.

5.3 **Recommendations**

5.3.1 **Summary**

The study recommendations aim to provide a narrower focus to FAB policy, positioning FABs as a means to an end and complementary to other actions such as industrial partnerships. Whilst we propose that the expectation on FABs should be lowered, there are additional recommendations, including regulatory changes, that should make FABs more cost effective. We recommend that performance should be addressed through the performance scheme, with FABs contributing where cost beneficial only. Network development should continue to be managed by the Network Manager, working with FABs as much as possible, but not where FABs may introduce delay or suboptimal outcomes due to revenue concerns. This said, FABs are the best vehicle for airspace development where national/military interests are a barrier to progress in optimising the delivery of air navigation services. The study does not make any recommendations in respect of SESAR deployment, as industrial partnerships may be a more effective approach. This does not preclude FABs and the SESAR Deployment Manager working towards delivery per FAB, and there may be advantages to this where concepts are best deployed regionally.

The study recommendations are described in detail below, organised according to those addressed to the European Commission ("EU-level recommendations") and those addressed to FABs (which comprise both general and FAB-specific recommendations).

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The table below outlines the classification of the study recommendations.

Table 36 Classification of recommendations

Addressees	Nature
European Commission FABs/Member States	Strategic (STR)
	Regulatory (REG)
	Institutional (INST)
	Operational (OPS)
	Technical/Technological (TEC)
	Economic (ECO)
	Social (SOC)

5.3.2 EU-level recommendations

5.3.2.1 Recommendation No. 1: Reset the expectations of FABs (STR)

The longer term political goals of SES require fundamental changes in the configuration of operations to reduce the costs of service, which may only be achieved with strong political will at State-level. In the absence of such political will, industrial partnerships have emerged in parallel with FABs and have provided an alternative solution to drive performance.

In these circumstances, FABs should not be seen as the sole path to rationalisation or as an end in themselves. FABs should be refocused on operational and technical cooperation that is cost-beneficial, and the governance structures and administrative overheads of FABs should be in proportion to the likely benefits. In respect of airspace design and route development, work in this area should also involve the input of the Network Manager to reduce any side effects caused by revenue considerations of FAB partners.

With a resetting of expectations, the likely outcome is that FABs become refocused on airspace and operational partnerships, where they may increase their impact on flight efficiency, building on the progress made in Free Route Airspace improvements. Retaining a focused but light FAB governance will be important to help unblock constraints set by military considerations, so the full engagement of the military in FAB governance is critical.

Whilst resetting the expectation on FABs, the EC should place an even stronger focus on the performance scheme framework, treating FABs as one vehicle among others to bolster performance. Robust economic regulation will be essential to drive cost-efficiency gains, which have so far not materialised through synergies at FAB level and in respect of which industrial partnership may constitute a more effective driver.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

The preparatory phase of RP3 of the SES performance scheme constitutes a good opportunity to set the updated policy objectives and priorities regarding FABs, following the consultation of all relevant stakeholders.

5.3.2.2 Recommendation No. 2: Strengthen FAB business planning and transparency to foster progress (OPS/ECO/REG)

In resetting the expectations, FABs should move away from loose visions and become more concrete. In our view, revitalising FAB implementation requires more serious joint business planning, greater transparency and stronger accountability within FABs, as well as proper scrutiny by airspace users. Improved FAB business plans would give a better understanding of how a FAB will contribute to improved performance and help stakeholders to influence the types of FAB projects and their priorities.

The EC should hence pursue the following measures, including through regulatory changes as appropriate:

- Each FAB should be required to produce and regularly update a joint business plan, setting out the overall vision, strategy, deliverables and milestones of the FAB. The FAB business plans should be linked with the FAB Performance Plans, and subject to stakeholder consultation and EC review. Principles for FAB business planning have been outlined in section 4.4 of the present report.
- FABs should be required to report each year on the progress made in the implementation of their business plans. This should be done through the development and publication of annual reports, including a review with users. This could be associated with a regular progress monitoring process of FABs at EU level.

5.3.2.3 Recommendation No. 3: Encourage industrial partnerships (STR)

The performance framework may be credited for ANSPs' development of industrial partnerships. These tend to have light governance in pursuit of specific goals, and focus on well-defined projects. Industrial partnerships should therefore be encouraged, with assistance given by the Network Manager in spotting network opportunities for collaboration (e.g. rationalisation of CNS and other ancillary infrastructure and services). However, new partnerships should not become talking-shops, they should have a strict implementation focus.

In the framework of the SES II+ initiative, the European Commission has proposed to amend the substantive FAB legal provisions (art. 9a, EU Reg. 550/2004) so as to enable more flexibility within FAB structures and foster industrial partnerships. This course of action is supported by the conclusions of our study, and should be pursued by the European Commission.

5.3.2.4 Recommendation No. 4: Encourage inter-FAB cooperation (STR)

At the stakeholder workshop there was a reluctance by FAB stakeholders to consider a reconfiguration or amalgamation of FABs. It is understandable that the years spent developing the FAB governance structures would make ANSPs reluctant to change. However, our recommendation is for the Network Manager to look at related possible

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

options for FABs at the periphery of Europe, in terms of future network efficiency. In spite of the lack of enthusiasm to combine FABs, such a study should at least inform on network opportunities and the findings could be taken forward through inter-FAB cooperation.

Further, by definition the 2-state FABs have limited potential to address airspace issues based on traffic flows. For the 2-state FABs there is arguably nothing achieved as a FAB that could not have been achieved through the normal process of bilateral arrangements between the ANSPs - as happened prior to FABs. Thus the FAB provides a structure, but the structure does not facilitate a regional approach, as 2-states do not make a region. Thus, whilst it adds complexity to decision making, the 2-state FABs need to extend their scope to be effective in meeting the original intent of FAB of driving a regional approach.

5.3.2.5 **Recommendation No. 5: Promote pan-European extension of FABs (STR)**

The SES policy encapsulates a pan-European dimension which is closely linked with the EU enlargement process, the European Common Aviation Area (ECAA) Agreement²⁶⁵, and other comprehensive aviation agreements between the EU and Third Countries. The SES Framework Regulation expressly refers to the integration of EU partner countries in FABs²⁶⁶.

The Commission has supported the objective of extending FABs to the ECAA countries located in the South-East Europe region.²⁶⁷ Our study supports this approach, including in the light of operational considerations. The significance of this part of the European airspace is that it is located in the axis of the major traffic flows in Europe, i.e. the so-called South-East traffic flow. The recent events and the various airspace blockages (e.g. Eastern Ukraine, Syria, Libya), have significantly changed the traffic patterns in South-Eastern Europe and have a high influence on the network situation in Europe.

5.3.3 **FAB-level recommendations**

5.3.3.1 **General recommendations**

1. FABs should clarify their strategic priorities, and focus on maximising operational benefits to stakeholders. It is the role of the high-level governing body in each FAB to provide the needed strategic direction and to follow up on its realisation. (STR)

²⁶⁵ The European Common Aviation Area (ECAA) Agreement signed in 2006 is a commitment by all ECAA Partners to align their aviation legislation with the EU acquis and thus to become part of the EU aviation market. ECAA Partner countries comprise Albania, Bosnia and Herzegovina, the FYR of Macedonia, Kosovo*, Montenegro, and Serbia.

²⁶⁶ In accordance with article 7 of EU Regulation 549/2004 which stipulates: "*The Community and its Member States shall aim at and support the extension of the single European sky to countries which are not members of the European Union. To that end, they shall endeavour, either in the framework of agreements concluded with neighbouring third countries or in the context of agreements on functional airspace blocks, to extend the application of this Regulation, and of the measures referred to in Article 3, to those countries.*"

²⁶⁷ It should be noted that one ECAA country, Bosnia and Herzegovina, already takes part in a FAB (as member of FAB CE).

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

2. There are FAB-level synergies that remain untapped and, in the short to medium term, FABs should implement relevant best practices with a view to making the most of available opportunities. (STR)
3. The longer term political goals of SES are unlikely to be achieved by airspace changes alone – they require fundamental changes in the configuration of operations to reduce the costs of service, which may only be achieved with strong political will at State-level. In the absence of such political will, alternative approaches to drive improved performance such as the industrial partnerships have emerged. The existing alternatives should be nurtured, additional alternatives identified and facilitated so that FABs are not the sole path to rationalisation. (STR)
4. FAB governance should be calibrated to foster the delivery of key technical and operational benefits. As far as practicable, Member States should consider the possibility of delegating more FAB governance responsibilities to CAAs/NSAs, in an effort to shift the focus of FAB governance to technical cooperation. (INST)
5. There should be a possibility for governing structures within multi-State FABs to adopt decisions based on a simple majority of votes in cases where consensus cannot be reached. This possibility should apply at least in matters related to the implementation of FAB strategic plans and objectives which have been already approved by the FAB high-level governing body or bodies. (INST)
6. FAB implementation should not prevent smaller groups of States or ANSPs within FABs to establish enhanced cooperation arrangements, even if the project or activity concerned is not supported by all FAB members. The same flexibility is also needed in respect of inter-FAB industrial partnerships. (INST)
7. Each FAB (at ANSP level) should consider strengthening the management of their common activities through the establishment of a joint legal entity which is entrusted with project management responsibilities. This approach has generated positive results in the FABs where it has been implemented. (INST)
8. FABs should ensure that their activities are transparent and that relevant information on the FAB plans and results is made available, preferably online. (INST)
9. As FABs are vehicles for delivering benefits to airspace users they should ensure a strong customer engagement. This would help FABs refocus their activities on performance improvements and the related key operational priorities. FABs should ensure the regular consultation of airspace users, and aim to directly involve relevant airspace users in their governance structures in order to support FAB progress. (INST)
10. FABs should ensure the appropriate, continuous involvement of relevant military stakeholders in the FAB governance and implementation. (INST/OPS)
11. FABs should consider strengthening the NSA level processes for performance planning, i.e. by agreeing on more ambitious NSA working arrangements focusing the development of the Performance plan on FAB level. The process for FAB

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- performance planning should not be based on the sole aggregation of values and contributions produced at national level. (REG)
12. There is still a need for a more common approach by NSAs in oversight activities to reuse information and results; between the different national activities within the FAB and industrial partnerships. Today the information required by the different NSAs to perform oversight differs in both the type of content needed and the depth. (REG)
 13. FABs should ensure the appropriate consultation of employee representatives on key FAB social issues and should ensure adequate consultative arrangements through a FAB level social dialogue mechanism. (SOC)
 14. Each FAB should establish and regularly update a business plan which will guide FAB entities in successfully implementing the joint activities. It is recommended that the FAB business plans should be maintained based on a FAB business plan template and guidance in order to better plan, manage and evaluate FAB performance. (OPS/TEC/ECO)
 15. A gate-to-gate approach recognises the inter-relationship between ANS services in terms of impact on performance of the total system (particularly delay, cost efficiency and safety). Furthermore, it removes the artificial allocation of cost between services which are delivered off a substantially common technology platform. To the extent that these problems may be addressed at the FAB level, such as extended arrivals management, it is recommended that FABs include TMA and aerodrome operations and infrastructure in their scope. (OPS)
 16. FABs should pursue cooperation with Third Countries with a view to optimising operational performance. FABs located in the South-East Europe region should be open to the gradual integration of ECAA Partner Countries in FABs, as foreseen in the context of the ECAA Agreement. (OPS)
 17. The expectation for FABs to optimise operations should be focused on airspace and route development. Work in this area should also involve the input of the Network Manager. (OPS)
 18. FABs should also seek opportunities to implement new SESAR concepts that improve terminal airspace flows, but this should not be limited to FABs and may be done on a bilateral basis within and between FABs. (TEC)
 19. FABs should focus on technical harmonisation and rationalisation of infrastructure and support services where cost-beneficial, and for ANSPs to explore alternative arrangements for this through outsourcing or industrial partnerships where the FAB is not seen as the appropriate vehicle. (TEC/ECO)
 20. Member States should consider engaging FABs as agents for the coordination of technical (and operational) roadmaps for SESAR deployment. (TEC)

5.3.3.2 FAB specific recommendations

The FAB-specific recommendations provided below aim to complement or substantiate the general recommendations set out above. In other words, each FAB is advised to

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

follow both the presented general recommendations and the FAB-specific recommendations below.

BALTIC FAB

- The BALTIC FAB should ensure that the composition of the FAB Council and FAB Board guarantees the impartiality and independence of decision-making in respect of the supervision of ANS within the FAB, in particular as regards the adoption of the FAB performance plan.
- The BALTIC FAB should produce and publish annual reports on the progress made by the FAB. The FAB website should contain all the relevant, up-to-date FAB information.
- The BALTIC FAB should ensure the effective implementation of the FAB social dialogue mechanism foreseen in ANSP level legal instruments.
- The BALTIC FAB should proceed with the development of a common set of procedures or NSA Handbook, adapted to the FAB needs.
- The BALTIC FAB should encourage common NSA audit activities, with the participation of the visiting NSA inspector(s) as observer(s).
- It is recommended that the BALTIC FAB carries out a study on the concept of the common charging zone, including the impacts this will have on the four KPAs in the performance scheme. When compared to the other FABs on this benchmarking criteria, the dispersion of unit rates is relatively low, but nonetheless big enough to realize potential benefits
- The FAB should maintain momentum on iTEC solution as it provides a common technical platform for the FAB going forward.
- The BALTIC FAB should continue the strategy of cooperation with other states and other FAB to address the constraints of being a 2-state FAB.

BLUE MED FAB

- The BLUE MED FAB should produce and publish annual reports on the progress made by the FAB. Other relevant FAB documentation should also be made available online on the website.
- The BLUE MED FAB should continue consulting airspace users on an annual basis on the FAB developments, following the first BLUE MED Customer Care meeting held in April 2016.
- The BLUE MED FAB should ensure the effective implementation of the FAB social dialogue mechanism established within the FAB (defined by the Joint Declaration and related ToRs).
- Given the high dispersion of unit rates between the BLUE MED states, potential benefits that stem from a common level charging zone are the highest among the FABs. It is therefore recommended BLUE MED reinvestigate the implications of a common charging zone, including an assessment into possible ways to overcome the issues regarding differences in size, institutional structures and cost bases.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- The BLUE MED FAB would benefit from updating the FAB operational concept, and the FAB technology roadmap so they are living and relevant documents comprehensively covering the delivery of CNS/ATM in the combined airspace.
- The BLUE MED FAB is advised to strengthen the FAB secretariat – a well-functioning project office and methodologies are essential, even more so in the case of a large FAB such as BLUE MED. It is advisable to implement robust project management tools and approaches similar to those adopted by FABCE.
- The BLUE MED FAB should more proactively pursue a rationalisation of support services with a focus on realising the benefits of a shared service model to achieve cost savings in the provision of support services. This would assist the FAB in delivering tangible benefits in terms of rationalisation of services leveraging the potential of the FAB arrangement

DANUBE FAB

- The DANUBE FAB should ensure that the composition of the FAB Council guarantees the impartiality and independence of decision-making in respect of the supervision of ANS within the FAB, in particular as regards the adoption of the FAB performance plan.
- The DANUBE FAB should proceed with the development of a common set of procedures or NSA Handbook, adapted to the FAB needs.
- The DANUBE FAB should encourage common NSA audit activities, with the participation of the visiting NSA inspector(s) as observer(s).
- The DANUBE FAB should build on the success of the CBA by identifying how the legal, operational, military and other arrangements put in place can be extended to create greater level of integration in service provision.
- The DANUBE FAB should continue the strategy of cooperation with other states, FAB and alliances beyond the FAB to address the constraints of a 2-state FAB.
- The DANUBE FAB should update the CBA for the first benefits that have been achieved through FRA and cross-border sectorisation initiatives.
- The DANUBE FAB should aim to undertake concrete resource-efficiency measures like the criteria and related actions as agreed at the Council of the EU on SES II+. A joint procurement vehicle to gain procurement savings is an example.

DK-SE FAB

- The DK-SE FAB (NUAC company) should publish annual activity reports, and outline the progress made in relation to the implementation of FAB projects as well as inter-FAB cooperation initiatives.
- The DK-SE FAB should coordinate with the Swedish Military to find a way of involving their airspace in FUA processes.
- The DK-SE FAB should continue, through the Borealis arrangement to extend the FRA region and continue to examine the option to include Oresund TMA in the FAB.
- The DK-SE FAB should continue to optimise the NEFRA project with NEFAB.
- The DK-SE FAB should continue the NUAC practices and reduce prices for en-route further.

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- The DK-SE FAB should assess how the current low spread in unit rate can be formalised into a common charging zone.
- The DK-SE FAB should continue to optimise common procurement projects (through COOPANS).

FAB CE

- FAB CE should produce and publish annual reports on the progress made by the FAB.
- FAB CE should set up an annual consultation mechanism of airspace users on the FAB progress and plans.
- FAB CE should encourage common NSA audit activities, with the participation of the visiting NSA inspector(s) as observer(s).
- FAB CE should proceed with the development of a common set of procedures or NSA Handbook, adapted to the FAB needs.
- FAB CE should actively pursue opportunities to exploit the potential for joint procurement of systems.
- FAB CE should be more proactive in pursuit of rationalisation of support services with a focus on realising the benefits of a shared service model to achieve cost savings in the provision of support services.
- FAB CE should pursue the ANSP level project concerning the possible common charging zone and look into the available options.

FABEC

- FABEC should produce and publish annual reports on the progress made by the FAB.
- FABEC should pursue the technical changes necessary (in the French systems) to support the SW/FABEC border flow improvements.
- FABEC should progress initiatives to improve the gate to gate performance in the FAB airspace and beyond, working closely with neighbouring FAB and individual states as required to progress these initiatives
- FABEC should continue to update the CBA for FRA on a regular basis and start to update CBAs of other scheduled initiatives.
- FABEC should update the CBA for the XMAN project.
- FABEC should aim for ATCO mobility, including one harmonised training system.
- FABEC should continue the actions undertaken to make the FRA tool interoperable for all FABEC ANSPs.
- FABEC should take forward the development of a common charging zone based on the most beneficial scenario (drawing on results of specific study on this topic). Mitigating initiatives need to be undertaken to mobilise political support.

NEFAB

- NEFAB should establish, in consultation with social partners appropriate social dialogue mechanism arrangements at FAB level.
- NEFAB should encourage common NSA audit activities, with the participation of the visiting NSA inspector(s) as observer(s).

**Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467**

- It is recommended that NEFAB carries out a study on the concept of the common charging zone, including the impacts this will have on the four KPAs in the performance scheme, and concrete implementation scenarios. When compared to the other FABs on this benchmarking criteria, the dispersion of unit rates is average, and big enough to realize potential benefits
- NEFAB should continue, through the NEFRA project with DK-SE FAB and the Borealis arrangement to extend the FRA region, with particular reference to improvements for Oceanic traffic. Aim to understand to which extent FRA is truly used and to quantify the materialised benefits.
- NEFAB should pursue the implementation of resource-efficiency measures (such as cross-border delegations) that contribute to improving cost-efficiency.
- NEFAB should continue to encourage ANSPs to closer cooperation and joint activities

SW FAB

- The SW FAB should ensure the effective implementation of the FAB social dialogue mechanism.
- The SW FAB should proceed with the development of a common set of procedures or NSA Handbook, adapted to the FAB needs.
- It is recommended that SW FAB carries out a study on the concept of the common charging zone, including the impacts this will have on the four KPAs in the performance scheme, and concrete implementation scenarios. When compared to the other FABs on this benchmarking criteria, the dispersion is of unit rates average, and big enough to realize potential benefits.
- The SW FAB should continue to seek FRA changes which improve flows to North Africa and the Oceanic regions.
- The SW FAB should continue with the Projects in the OB CP 15 19 plan Continue with the Safety Management System exchanges in order the cement the Just Culture approach within the region's culture.

UK-IRL FAB

- The UK-Ireland FAB should produce and publish annual reports on the progress made by the FAB.
- The UK-Ireland FAB should ensure the effective implementation of the FAB social dialogue mechanism foreseen in ANSP level legal instruments.
- Given the high dispersion between the 2-states, potential benefits that stem from a common level charging zone are the highest among the FABs. It is therefore recommended UK-IRL FAB reinvestigate the implications of a common charging zone, including an assessment into possible ways to overcome the issues regarding differences in size, institutional structures and cost bases.
- The UK-Ireland FAB should continue, through the Borealis arrangement to extend the FRA regions, with particular reference to improvements for Oceanic traffic.
- Continue to examine ways of using the FAB system to reduce holding delays at Heathrow.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

- The UK-Ireland FAB should be invited to demonstrate the joint regulator processes to other FABs and States.
- Continue to coordinate ANSPs' investment plans.

Study on Functional Airspace Blocks
EC Specific Contract MOVE E2/SER/2016-194/SI2.735467

ANNEX I

Frequently used abbreviations and acronyms

ACC	Area Control Centre
AIS	Aeronautical information service
ANS	Air Navigation Services
ANSP	Air Navigation Services Provider
ASM	Airspace Management
ATCO	Air Traffic Controller
ATFCM	Air Traffic Flow and Capacity Management
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
ATS	Air Traffic Services
CAA	Civil Aviation Authority
CBA	Cost Benefit Analysis
CNS	Communication, Navigation and Surveillance services
DUR	Determined Unit Rate
EASA	European Aviation Safety Agency
EC	European Commission
ECAA	European Common Aviation Area (Agreement)
ERNIP	European Route Network Improvement Plan
ESSIP	European Single Sky Implementation plan
EUROCONTROL	The European Organisation for the Safety of Air Navigation
FAB	Functional Airspace Block
FIR	Flight Information Region
FL	Flight Level
FMP	Flow Management Position
FRA	Free Route Airspace
FUA	Flexible Use of Airspace
ICAO	International Civil Aviation Organization
KPA	Key Performance Area
KPI	Key Performance Indicator
LSSIP	Local Single Sky Implementation plans/reports
MET	Meteorological Services for Air Navigation
MIL	Military
NM	Network Manager
NOP	Network Operations Plan
NSA	National Supervisory Authority
PRB	Performance Review Body of the Single European Sky
RP	Reference Period
SES	Single European Sky
SSC	Single Sky Committee
STATFOR	EUROCONTROL Statistics & Forecasts Service
UAC	Upper Airspace Area Control Centre