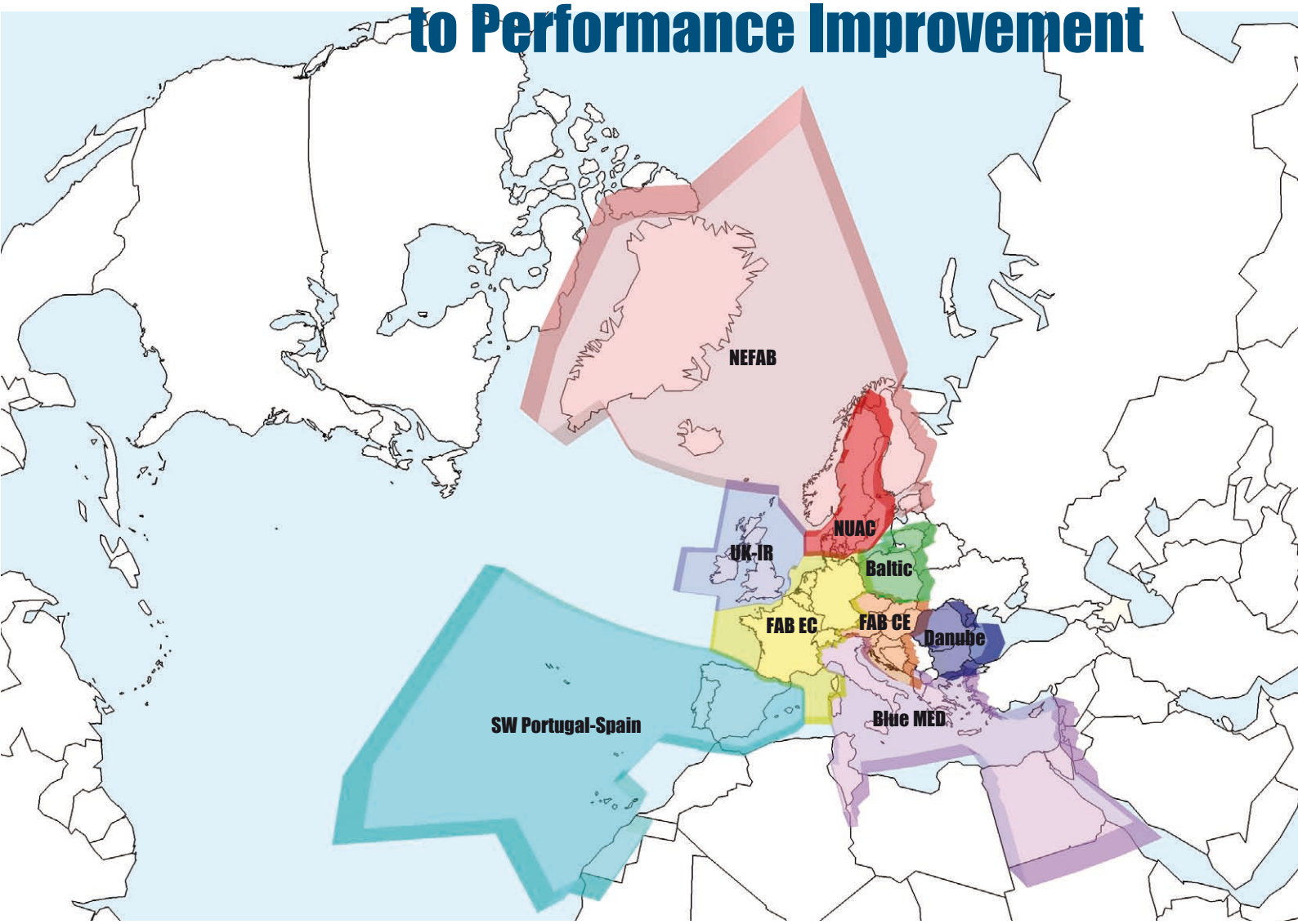
PERFORMANCE REVIEW COMMISSION

Evaluation of Functional Airspace Block (FAB) Initiatives and their contribution to Performance Improvement



Produced by the EUROCONTROL Performance Review Commission upon the invitation of the European Commission DG-TREN

October 2008

EUROCONTROL

Background information

This report presents an independent evaluation of FAB initiatives and their contribution to performance improvement in the Member States and associated States of the European Union.

It was prepared by the EUROCONTROL Performance Review Commission for the European Commission, at the latter's request.

The report was developed through extensive formal and informal consultation with European ATM Stakeholders at every stage of the project.

The final report was presented to the European Commission in October 2008.

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SUMMARY

This report has been produced by the independent Performance Review Commission (PRC) of the EUROCONTROL Organisation, upon the invitation of the European Commission DG-TREN.

This Final Report builds on an interim report published on 19 February 2008 and on a draft Final report published on 12 September 2008. It provides a factual and independent assessment of the nine Functional Airspace Block (FAB) initiatives at 1st July 2008. It identifies a number of key factual assessments and proposes several recommendations to Member States, the European Commission and ATM stakeholders to foster the creation of FABs with a view to improving ATM performance in Europe.

KEYWORDS

Functional Airspace Blocks (FABs)	Airspace Regulation	European Commission
Air Traffic Management (ATM)	Performance Measurement	States involvement
Single European Sky (SES)	Performance Improvements	ANSP cooperation

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1.1 Background

1.1.1 By letter dated 23 May 2007, the European Commission (EC) invited EUROCONTROL, and specifically the independent Performance Review Commission (PRC), to evaluate the Functional Airspace Block (FAB) initiatives and their added-value to performance improvements.

1.1.2 The objectives of this evaluation were (1) to describe the current initiatives, (2) to describe best practice for the drawing up of safety case and cost benefit analysis, (3) to establish a specific framework for evaluating performance improvements over time, (4) to identify key constraints and difficulties experienced and to suggest approaches to mitigate them, and (5) to suggest opportunities to amend the current governance, legal and regulatory arrangements to facilitate the creation of FABs.

1.2 Abstract

1.2.1 This Final report provides a comprehensive description and an assessment of the nine declared FAB initiatives at 1 July 2008 (Chapter 4) and a comparative analysis of those (Chapter 5).

1.2.2 Both are based on a framework, described in annex II, which identifies the characteristics, scope and schedule of each FAB, describes the arrangements set out to develop the FAB initiatives, and defines Key Performance Areas (KPA) and Key Performance Indicators (KPI). Figure 1-1 summarises the KPAs and KPIs.

Figure 1-1: FAB Performance framework

Safety	Efficiency			
	Economic	**Operational**	**Environmental**	**Technical**
Airspace events per flight Safety maturity Compliance with ESARRs	Financial cost-effectiveness KPIs	ATFM Delay Horizontal routing extension Delegation of ATS services provision Alignment of FAB with main traffic flows Airspace use and design: • Implementation of SES FUA • Airspace design and capacity planning process	Environmental impact due to horizontal routing extension	Interoperability of ATM systems Commonality of ATM systems

1.2.3 The origins and evolution of the FAB concept are recalled in Chapter 3. Chapter 6 reviews Cost-Benefits Analyses (CBAs) and approaches to safety cases. Chapter 7 presents conclusions and recommendations.

1.2.4 This Report has been produced based on more than 50 meetings, extensive documentation and consultation:

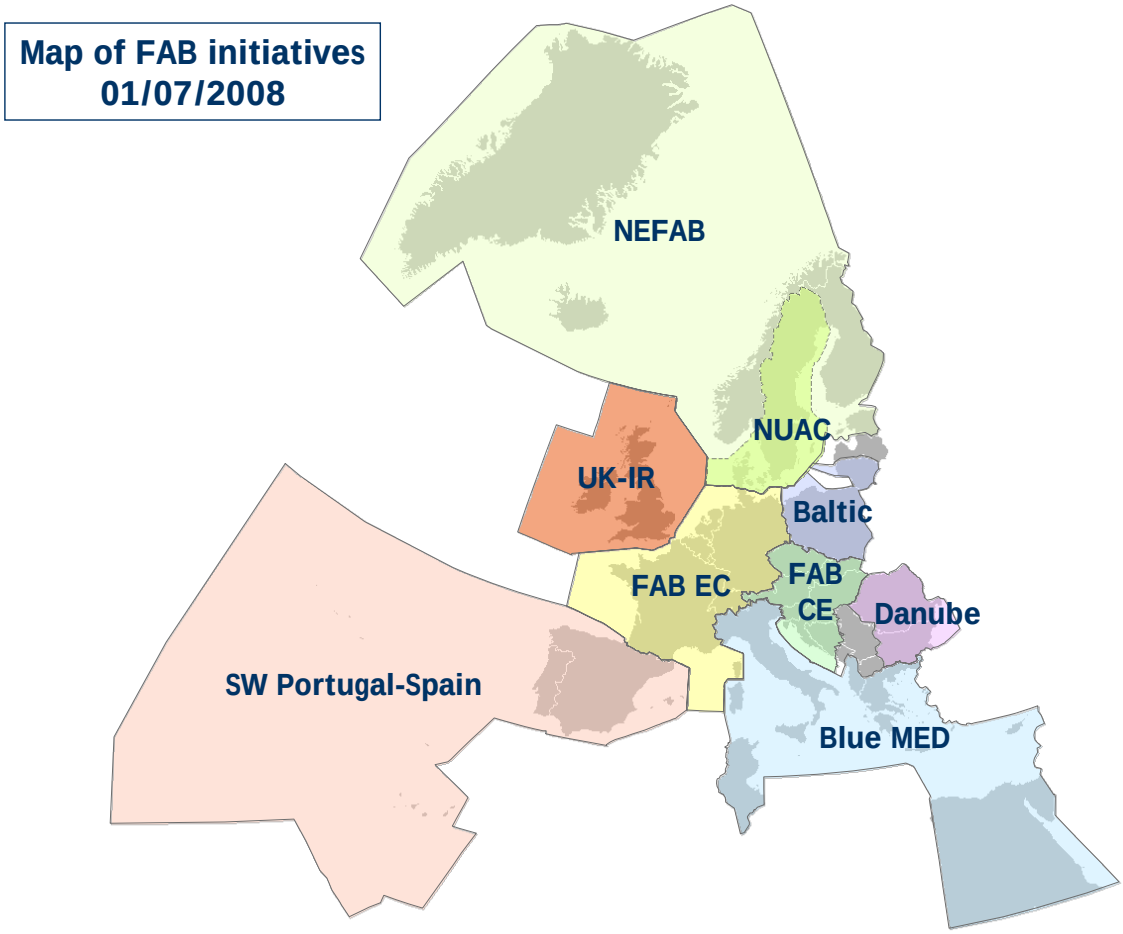
- Visits to the FAB representatives and formal “dossiers” validated by them,
- Written consultation, using comments received on the Interim Report (19 Feb. 2008) and draft Final Report (12 Sept. 2008), both displayed on the web;
- Oral consultation at two open meetings (22 Oct. 2007 and 25 Sept. 2008);

- Presentations and comments in different meetings (Single Sky Committee, Provisional Council Coordinating Committee, ANS Board, CMIC, ETF, ATCEUC, etc).

1.3 Assessment of the nine declared FAB initiatives

1.3.1 Nine FAB initiatives were declared to the European Commission at 1 July 2008. Their characteristics vary significantly (see map in Figure 1-2). FAB EC, which is located in the core area of Europe, is the largest FAB initiative (37% of flight-hours and costs).

Figure 1-2: Map of FAB initiatives - July 2008



1.3.2 At 1 July 2008, all 27 States of the European Union were involved actively in a FAB initiative except Latvia. Latvia had undertaken discussions with the Baltic initiative and was participating in the NEAP co-operation initiative, but was not a member of any FAB.

1.3.3 There are significant differences in the actions that are proposed, the progress that the FAB initiatives have made, the timescale over which implementation is expected, and the arrangements adopted for implementation.

1.3.4 All FABs plan to cover, to some extent, the SES I legislative requirements of airspace and operational changes. A number of FABs have also extended their plans to address issues of service provision integration, ATM systems, training and ATFM.

1.3.5 The PRC's assessment of progress made by the nine FAB initiatives during the course of the study (August 2007 - July 2008), and planned next steps, is as follows:

- **Baltic FAB:** There was limited progress during the first half of 2008. The initiative put a TEN-T bid for funding of a feasibility study in June 2008 and expect to produced a feasibility study by Q1 2010. Although relatively small, this FAB could foster significant performance improvements in the area, where there are specific issues, such as high traffic growth and the Kaliningrad area. A strong commitment by concerned States and ANSPs, the addition of Latvia to the FAB, and close links with neighbouring FABs would raise the prospect for benefits.
- **Blue Med:** There has been significant progress in 2008: the feasibility study was completed and a declaration of intent was signed by the CAA Director Generals in July 2008. Blue Med associates non-EU States, such as Egypt and Tunisia, which are important interfaces of the SES. The Definition phase (to be) agreed at a Ministerial conference in November 2008 should seek performance improvements beyond the relatively modest ones identified in the first economic assessment.
- **Danube FAB:** Progress has been made with Stage 2 of the feasibility assessment, which the concerned States and ANSPs have endorsed. The relatively high performance benefits identified in the CBA would need to be confirmed, and performance targets set for implementation. A decision whether to move to a preliminary design phase is anticipated towards the end of 2008.
- **FAB Central Europe:** The finalisation of the Master Plan, CBA and safety assessment, in March 2008 along with the ANSPs Memorandum of Cooperation and Member States Declaration of intent (with a MoU to follow at the end of 2008) demonstrates real progress over the period for FAB CE. A phased implementation is expected to start in 2009 with an initial scenario, followed by static and dynamic scenarios. It will be important to seek further benefits, as those identified in the CBA are relatively low.
- **FAB Europe Central:** The comprehensive feasibility study and CBA indicate prospects for high performance improvements in relative and absolute terms. FAB EC is on the critical path to meet the capacity requirements in the densest part of European airspace. Owing to its size and central position in Europe, the success of FAB EC will be important for the success of the SES. The strong involvement of all parties concerned in an important success factor.

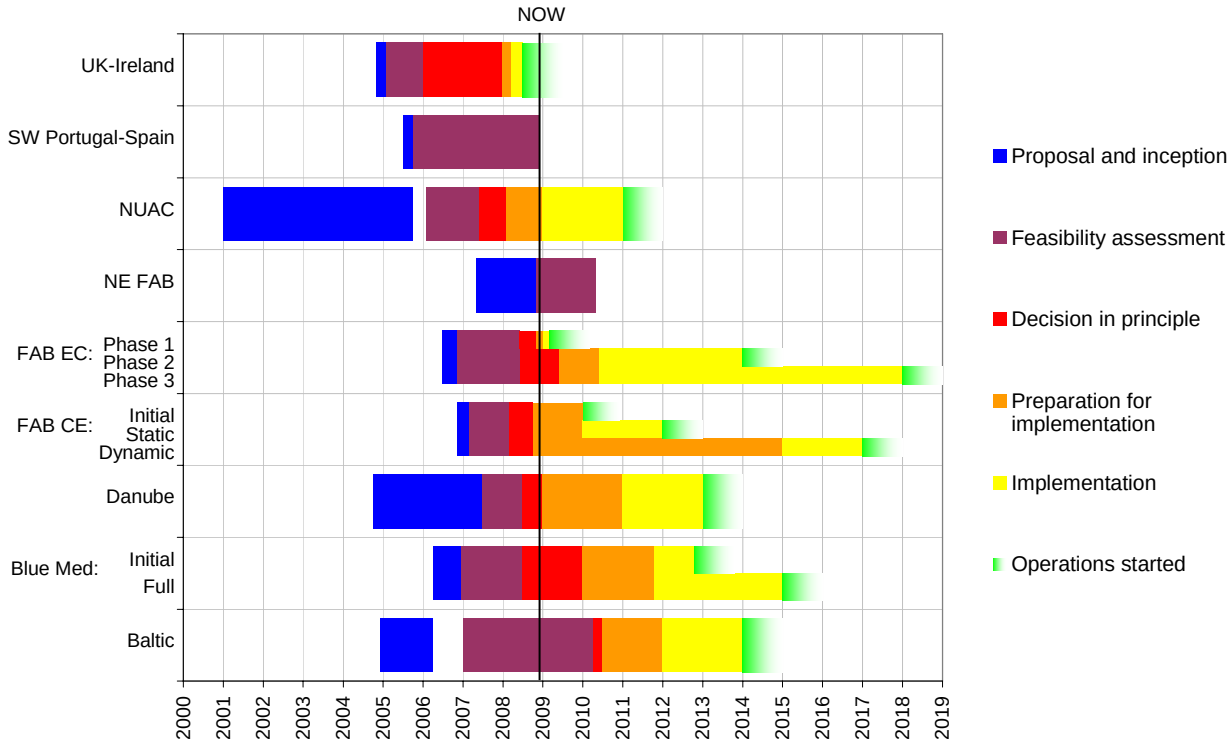
  The phased implementation will be launched with an official declaration in November 2008 starting with eight targeted key task forces.
- **NEFAB:** NEFAB is in the early stages of preparation. A pre-feasibility study was undertaken during the summer of 2008 covering a high level CBA, safety assessment and identification of possible show stoppers. The feasibility study is expected to be completed by May 2010.
- **NUAC:** NUAC is one of the most developed projects. It shows prospects for significant performance improvements. The ANSP CEOs have decided to proceed with the operational alliance option (having considered merger and alliance scenarios). But this needs to be confirmed with a final political decision by the Member States before the end of 2008. NUAC may become one of the service providers in NEFAB.
- **SW Portugal-Spain:** There has been limited progress during the first half of 2008. In October 2008, the two ANSPs have decided to launch in 2009 the development of a feasibility study of the FAB improvements, making use of

simulation tools (areas, routes, sectors) and including a CBA, to be performed during 2009. It will be important to generate significant performance improvements in the area, whether through a FAB, or otherwise.

- **FAB UK-Ireland:** This FAB was officially declared to the EC in June 2008 and started its operations. The first meetings of the FAB Management Board and Supervisory Committee took place in July and August 2008, respectively. The Board is now focussing on key priority areas and developing concrete projects for this FAB to deliver genuine performance improvements. Significant performance improvement should be sought, beyond the modest ones identified in the CBA.

1.3.6 There are wide variations in FAB schedules. The main milestones of FAB initiatives are summarised in Figure 1-3.

Figure 1-3: Timescale and main milestones for implementation of FABs



1.4 Conclusions and recommendations

1.4.1 The objective of SES regulations is to improve ANS performance. This first PRC evaluation of FABs shows that FABs can be an effective tool, amongst others, to reach SES performance objectives – provided there are a shared vision, ambitious objectives, and strong commitments from the stakeholders to effectively reach these objectives.

1.4.2 In fact, the proposed SES II package reinforces the FAB concept, the objective of which is "*to optimise and/or integrate the provision of ANS and related ancillary functions*". This is a clear step forward.

1.4.3 During 2008, six (out of nine) FABs have devoted significant effort and resources in developing feasibility studies. One FAB initiative, FAB UK-Ireland, was declared officially in June 2008 and came into effect in July 2008. It is clear that the legal

obligation to create FABs has generated a positive momentum for co-operation between ANSPs and between Member States, and opportunities for performance improvements beyond those achievable individually. This should be preserved and reinforced.

1.4.4 States should reaffirm their commitment to create FABs during the discussion on SES II in the Transport Council of the European Union in December 2008. Moreover, in order to further strengthen the momentum and focus the attention of all involved stakeholders, the PRC suggests that more detailed deadlines are introduced in SES II concerning the creation of FABs.

1.4.5 Most significant progress has taken place where there was a strong involvement of all key stakeholders (States, staff, military and airspace users) as well as cooperation between NSAs. The PRC therefore recommends strongly developing or strengthening social dialogue between staff representatives and ANSP management. It also recommends organising effective cooperation of NSAs and emphasising the need to address military issues and civil-military coordination.

1.4.6 Since all FABs follow boundaries of existing FIRs (and current ATS delegations), and that most FAB initiatives have concentrated primarily on improvements to the design of airspace within the FAB, there is a need to ensure the connectivity of the European network across FABs.

1.4.7 Improvement in flight-efficiency within each FAB provides significant opportunities for savings to airspace users and benefits for the environment. However, since approximately one quarter of European route extension issues can only be solved across FABs and Europe-wide, a strong and effective network management and design function at European level, as proposed in SES II, is crucial.

1.4.8 The definition and implementation of an appropriate charging regime within FABs, irrespective of national boundaries, will be key for an efficient route design and management of traffic flows.

1.4.9 Clearly each FAB is different and faces different political, operational, technical and economic challenges. The evaluation has identified that FAB initiatives show wide differences in scope, timescales and approaches. It is therefore clear that a flexibility of approach needs to be maintained, as long as performance improvements are delivered.

1.4.10 Several FAB initiatives implicitly or explicitly consider one or more of the following ANS cooperation scenarios: co-operation agreement, operational alliance (some joint functions) and merger. A progressive evolution is sometimes foreseen, although no clear intentions and schedules have been defined so far. It is interesting to note that a representative staff organisation advocates the full merger scenario in the MOSAIC project.

1.4.11 A comparison of feasibility studies shows that a lot of effort is devoted in each FAB on the same issues and with similar results. Moreover, most FAB initiatives have reported similar impediments to the creation of FABs. Greater guidance and coordination for the establishment of FABs would help avoid misunderstandings and duplication of work. The PRC therefore proposes some concrete ideas for the development of guidance/requirements in terms of operational concept, safety, ATFCM/ASM, interoperability of systems, charging, sovereignty, liability, and CBAs.

1.4.12 In particular, the issues of sovereignty and liability require careful attention from an early stage within the FAB in order to find and implement the proper legal arrangements which might require amendments to Aviation Acts, contractual arrangements between ANSPs and full involvement of the military.

1.4.13 The definition and implementation of an appropriate charging regime within FABs, irrespective of national boundaries, is key for an efficient route design and management of traffic flows.

1.4.14 By October 2008, only six CBAs (or high level economic appraisal) had been received, albeit with various levels of maturity and completion. Available CBAs were organised differently and built on different assumptions, which makes a comparison of expected performance benefits challenging.

1.4.15 Nevertheless, for illustration purposes, the PRC has attempted to evaluate the net projected benefits in 2013 and in 2018 for each FAB, and to relate these benefits to the 2006 total economic costs (ANS provision costs + costs of route extension and ATFM delays incurred by airspace users). A summary of this comparison is presented in Figure 1-4.

1.4.16 Although only orders of magnitude should be considered, double digit benefits are anticipated from FAB EC, NUAC and Danube. This confirms that FABs are one of the SES tools to improve ANS performance. It will be important to ensure that such levels of improvement are achieved.

1.4.17 Moreover, the evaluation shows that most savings are expected from improvements in flight-efficiency and delays, rather than savings in ANSPs' service provision costs. As the latter form the bulk of ANS total costs, this indicates room for yet further improvements.

Figure 1-4: Summary of quantified benefits from available CBAs

	2013 benefits in M€	2013 benefits as % of 2006 total economic costs	*% from flight efficiency or delay*	2018 benefits in M€	2018 benefits as % of 2006 total economic costs	*% from flight efficiency or delay*
Blue Med	14 – 49	1 – 5%		14 – 71	2 – 7%	
Danube *	29 – 52	12 – 22%	*99%*	29 – 52	12 – 22%	*99%*
FAB CE	6	1%	*53%*	21 – 30	4 – 6%	*55%*
FAB EC	260	8%	*77%*	1150	36%	*83%*
NUAC	47	17%	*72%*	51	18%	*81%*
UK-Ireland	12	1%	*100%*	40	4%	*63%*

*: Assumptions and expert judgements would need to be confirmed.

1.4.18 Notwithstanding the fact that it is one of the requirements for FABs, no "Safety Cases" could be developed at this stage, since they can only be performed when the FAB is fully specified operationally. The corresponding wording in SES I (Article 5(2) of the airspace Regulation) would need to be replaced by "Safety assessments".

1.4.19 A number of FABs have identified specific performance indicators and associated performance objectives/targets. This anticipates some of the SES II proposals.

Where applicable, and with some prerequisites, setting performance targets at FAB level in lieu of national level would have several advantages:

- It would reduce the number of local target setting processes and the work of the European Commission, NSAs, users and the Performance Review Body;
- It would reinforce the cohesion of ANSPs, reduce fragmentation while keeping the bottom-up approach, and give a very concrete meaning to FABs.

1.4.20 There are prerequisites for setting performance targets at FAB level in a SES II context, in particular clear accountability and oversight for meeting the targets, a degree of prior convergence in performance, a common approach to performance management and common performance reporting in the respective FABs.

1.4.21 Finally, it will be important to monitor progress and maintain pressure on FABs to deliver genuine performance improvements and meet the planned deadlines and deliverables. The PRC recommends that a similar review of FABs is undertaken periodically, using the same framework to assess progress made with reference to the situation at 1 July 2008 presented in this report, and to the respective FAB plans.

2 INTRODUCTION

2.1 The context

2.1.1 The Single European Sky's (SES) Framework Regulation (549/2004) has a number of objectives:

- to enhance current safety standards;
- to enhance overall efficiency for general air traffic in Europe;
- to optimise capacity meeting the requirements of all airspace users; and
- to minimise delay.

2.1.2 Functional Airspace Blocks (FABs) are one of the tools introduced by the SES regulations to achieve these objectives.

2.1.3 FABs create the opportunity to improve the design and organisation of airspace. They also provide a vehicle for reducing the fragmentation of service provision. Each of these issues has been the subject of recent studies undertaken by the independent Performance Review Commission of the EUROCONTROL Organisation (hereinafter referred to as the PRC).

2.1.4 In the PRC's study: *"Evaluation of the Impact of the Single European Sky Initiative on ATM Performance"*, made at the request of the European Commission (EC) the PRC made the following FAB-related recommendations:

- make the objectives of FABs clearer;
- make available European Union (EU) financial support for the creation of FABs (short term);
- develop common general principles for the establishment and modification of FABs (short term);
- develop a set of performance indicators to assess the performance improvements arising from FABs (short term) and;
- reassess the mechanisms for the creation of FABs (medium term).

2.1.5 Since the creation of the SES, there has been considerable activity in Europe investigating the feasibility of introducing FAB initiatives. Amongst the stakeholder community there would appear to be a lack of clarity as to the status of the FAB initiatives. This study aims to describe the status of these initiatives, to provide this clarification, and to provide a cross-Europe understanding of the key steps required to be taken to create a FAB, including the identification of costs and benefits, and key learning points from the experience to date.

2.1.6 Towards the end of this study (June 2008) the European Commission published its Communication and proposed amendments to the SES Regulations, under its Single European Sky II package. These, *inter alia*, establish the following new key principles for FABs:

- should be encouraged to address service provision as well as airspace design (and have been added to the Service Provision Regulation 550/2004)
- should cover both upper and lower airspace;
- should set firm deadlines for implementation (the latest by end 2012);

- the Commission will develop implementing rules to support FAB creation.

2.1.7 In addition, the proposals introduce a system of performance regulation through the setting of binding targets, and strengthening of the role of the Network Management Function.

2.1.8 The Communication also emphasised the importance of building a sustainable development of aviation, in particular emphasising the role of shortening route distances in saving fuel and reducing the emissions impact of aviation.

2.2 Background

2.2.1 In May 2007, the European Commission invited the PRC to provide an independent "evaluation of the FAB initiatives and of their contribution to performance improvements".

2.2.2 The objective of the study is to assist the Commission in preparing its report on experience in implementing Article 5 of the SES Airspace Regulation (551/2004) which is planned within five years after 2004 in compliance with the statement attached to the SES regulations.

2.2.3 This report forms the Final Report of the study. The key phases of the work were as follows:

- Kick-off consultation meeting with stakeholders held on 22 October 2007;
- Interim Report published (February 2008)
- Draft Final Report issued for consultation in early September 2008, with a consultation period up to 15 October 2008;
- Stakeholder Meeting on 25 September 2008 at EUROCONTROL's Headquarters in Brussels; and
- Final Report published in October 2008.

2.2.4 The report contains data and comments from FAB initiatives received by the study team by 1 July 2008. Where data have been received after then, the PRC has striven to reflect it but provides no guarantee of doing so.

2.3 Request from European Commission

2.3.1 The EC's aforementioned request for support to the PRC contained five main tasks:

Task 1: The production of a 'Fact Sheet' for each current FAB initiative, requiring direct contact with the stakeholders of each initiative.

Task 2: The description of 'Best Practice' for the drawing up of safety and business cases (using cost benefit analysis).

Task 3: The establishment of a framework for evaluating performance improvements:

- within a FAB area, over time and against a chosen timeline; and
- aggregated performance improvements from all the FAB initiatives at a European level.

Task 4: The identification of key constraints and difficulties experienced so as to make a suggestion for approaches to mitigating them.

Task 5: The suggestion for opportunities to amend the current governance, legal and regulatory arrangements to facilitate the creation of FABs.

2.3.2 This Draft Final Report covers all these tasks.

2.4 Approach to the evaluation and data collection

2.4.1 This evaluation is conducted by the PRC, supported by the Performance Review Unit (PRU) of EUROCONTROL. Following an open call for tender, the consultancy firm Steer Davies Gleave was commissioned to support the PRC and PRU during the study.

2.4.2 The approach taken has been to draw upon all possible sources of information available to the study team, including publicly available data, information already collected by EUROCONTROL (and in particular by the PRU), and information collected through a stakeholder consultation process with each FAB initiative which included:

- initial contact and designation of FAB initiative contact points;
- preparation of a draft dossier, setting out the study team's initial understanding of the FAB initiative and outlining some key questions and subject areas for clarification and discussion;
- bilateral meetings with representatives of the FAB initiatives;
- refinement and updating of each dossier to reflect the outcome of the bilateral meetings; and
- cross-checking of the updated dossiers with FAB initiative representatives.

2.4.3 Two rounds of consultation and amendments took place: the first round to support the Interim Report took place in the final quarter of 2007, the second round to support this Final report was conducted during the second quarter of 2008.

2.4.4 In addition, the study team invited views from all stakeholders during two open stakeholder meetings on 22 October 2007 and 25 September 2008 at EUROCONTROL's headquarters in Brussels. In addition, stakeholders were invited to provide written comments on the Interim Report during February 2008 and on the draft Final Report during September 2008.

2.4.5 During the study, the team conducted the following bilateral meetings with declared FAB initiatives. Figure 2-1 summarises the timing of these meetings:

Figure 2-1: Bilateral Meetings

FAB initiative	Date	FAB initiative	Date
Baltic FAB	07/12/2007	NEFAB	02/06/2008
Blue Med	15&16/10/2007, 22/05/2008	NUAC	02/10/2007, 26/06/2008
Danube FAB	04/12/2007, 28/05/2008[1]	SEE FABA[2]	05/12/2007
FAB Central Europe	03/12/2007, 24/06/2008	SW Portugal-Spain	08/11/2007
FAB Europe Central	28/09/2007, 02/05/2008	FAB UK-IR	29/11/2007, 08/05/2008

2.4.6 In the case of the SW Portugal-Spain and Baltic FABs, following discussion with FAB management, it was agreed that a second stakeholder meeting would not take place.

1 The PRC attended and participated in the stakeholder meeting
2 On the basis of this meeting, SEE FABA is no longer construed as a FAB initiative.

2.4.7 This Final Report reflects the information gathered from all of the bilateral meetings undertaken.

2.4.8 On the basis of the information collected, views provided and analysis undertaken, the PRC has undertaken an independent, factual analysis of the issues raised.

2.5 The scope of airspace covered by the report

2.5.1 The SES Regulations require that upper airspace within the EUR and AFI ICAO regions must be reconfigured into FABs. In addition to the EU Member States, the SES Regulations are binding on States that have entered into bilateral or multilateral air transport agreements with the EU. These States include Norway, Switzerland, the Western Balkan countries and Iceland, although Iceland is not obliged to form a FAB because it is not within EUR or AFI airspace.

2.5.2 The amendments to the Regulations proposed under SES II extend the FAB concept to all airspace including lower airspace up to the airport.

2.6 Organisation of this report

2.6.1 The remainder of this report is organised as follows:

- **Chapter 3 "Background to the FAB concept":** a review of the legislation and other relevant documents.
- **Chapter 4 "The Current FAB initiatives"**: describes each of the nine declared FAB initiatives, including staff and users' views and the PRC's assessment of each FAB.
- **Chapter 5 "Cross FAB analysis"**: uses the performance framework to compare FABs.
- **Chapter 6 "Review of Best Practice":** reviews emerging best practice in the production of Safety Assessments and Cost Benefit Analysis, including a summary of quantified benefits where available.
- **Chapter 7 "Factual Assessment Summary, Conclusions, Recommendations":** gives a factual assessment of issues arising and provides the PRC's recommendations to the Member States, the European Commission and other ATM Stakeholders.

2.6.2 Annex I contains Fact Sheets for each of the FAB initiatives.

2.6.3 Annex II contains a description of the framework used in this report to evaluate the FAB initiatives.

2.6.4 Annex III contains a description of the MOSAIC and ETF co-operation proposals.

3 BACKGROUND TO THE FAB CONCEPT

3.1 Introduction

3.1.1 There are a number of different views and opinions from industry stakeholders as to what constitutes a FAB, and what it should be expected to achieve. At the outset of our study, we reviewed the legislation, draft legislation and a number of background reports and studies which chronicle the creation, evolution and development of the FAB concept.

3.1.2 This review has then formed the basis of the frameworks we have designed for assessment of the characteristics of each FAB initiative, and progress with implementation described in Annex II and implemented in Chapter 0 and 5.

3.1.3 Chapter 3 summarises other reports and studies where these provide more information on the purpose or characteristics of FABs, the process of implementation, or issues that have arisen with this. At the end of the chapter we highlight some initial conclusions from the review of the legislation and reports.

3.1.4 The reports and legislation that we have reviewed are the following:

- Conclusions of the High Level Group (2000).
- Single European Sky (SES) studies (2001).
- Draft Single European Sky legislation (2001).
- Final Single European Sky legislation (2004).
- Commission Regulations (implementing rules) on Flexible Use of Airspace (2005) and Common Charging Arrangements (2006).
- EUROCONTROL's report on the European Commission's mandate to support the creation of FABs (2005).
- FAB Workshop conclusions, organised by DG TREN and the Department of Transport of the United Kingdom (2006).
- PRC report on the impact of the SES initiative on ATM performance (2006).
- Joint statements from CANSO and ETF on Functional Airspace Blocks (2004 & 2007).
- Communication from the European Commission: A mid-term status report on the building of the SES through FABs (2007).
- Conclusions of the High Level Group (2007).
- Communication from the European Commission: Single European Sky II: towards a more sustainable and better performing aviation, and supporting amendment to the SES I legislation to improve the performance and sustainability of the European aviation system (2008)

3.2 Conclusions of the 2000 High Level Group

3.2.1 The High Level Group (HLG) on the Single European Sky, established by the then European Commissioner for Transport, Loyola de Palacio, reported in 2000. Its work was undertaken against a background of severe air traffic flow management (ATFM) delays, caused by a structural lack of Air Traffic Management (ATM) capacity.

3.2.2 The 2000 HLG identified a number of problems with the organisation and operation of European air navigation services, including inconsistency in airspace design, fragmentation in service provision, a lack of interoperable technology, and institutional and regulatory issues. It made recommendations in order to address these issues, the most significant of which were in the following areas:

- institutional issues;
- airspace design and management;
- organisation of service provision;
- regulation; and
- systems and operations.

3.2.3 However, it is important to note that the 2000 HLG report did not specifically refer to FABs in its "Airspace" section, although it did recommend that airspace should be managed as a single continuum: this could be delivered through a FAB but would not necessarily have to be. An implicit reference to a structure such as a FAB can nevertheless be found in its "Service Provision" section which supported the "cooperation between service providers, in particular at regional level, either on a contractual basis or through more structural arrangements such as joint ventures, as a useful way to enhance the integrated management of airspace and **to operate airspace blocks regardless of national borders**" (paragraph 87 page 29).

3.2.4 The main recommendations of the 2000 HLG which are relevant to this study are:

- **Airspace design and management:** Airspace should be managed for overall system efficiency as a 'single continuum' to optimise performance and therefore would need to be designed and regulated at a European level. The integration of airspace would start with uniform airspace categories, optimisation of route and sector designs, and flexible use of airspace; in the longer term concepts such as 'free routing' could be introduced. Initially, this would only apply to upper airspace but in the future would apply to lower airspace as well.
- **Organisation of service provision:** There should be co-operation between service providers, either on a contractual basis or through arrangements such as joint ventures, in order to enhance the integrated management of airspace and to operate airspace blocks regardless of national borders.
- **Regulation:** Strong regulators, independent of service providers, to set high level rules for safety and system performance and ensure implementation.
- **System design:** ANSPs to adopt compatible and interoperable technology, and a consistent approach to technical regulation.

3.3 Single European Sky studies

3.3.1 The European Commission procured a number of studies into the implementation of the Single European Sky, which reported in 2001. These studies built on the work of the 2000 HLG and their recommendations were incorporated in the various draft Regulations that were introduced in 2001 (discussed below).

STUDY ON AIRSPACE MANAGEMENT AND DESIGN

3.3.2 For the purpose of this study, the most significant recommendation was the establishment of FABs, which were to ensure that the organisation of airspace was determined by the requirements of economic and operational efficiency, safety and fairness, rather than historical geographical boundaries. This recommendation was

set out in the study on airspace management and design, conducted by Wilmer, Cutler & Pickering (2001). **This study was the first to introduce the concept of FAB**.

3.3.3 The study envisaged that FABs would replace the current upper controlled airspace operated by ANSPs, thereby implying – although not specifically stating – that FABs might be similarly cross border like the Maastricht UAC. However, the report did not clearly define exactly what a FAB would do beyond this. This may have been because it was recommended that the implementation of FABs should take place in a second stage of Single Sky legislation and, therefore, although the report provided recommendations for the relevant Regulation, the introduction of FABs was not specified in detail.

3.3.4 The study evaluated three options for implementing FABs:

- Bottom-up regional co-operation (the model eventually used);
- Joint franchising by Member States; and
- European franchising.

3.3.5 The report identified that the second and third options could be more effective, but probably were not politically acceptable to the Member States. It identified that the first option was the most practical to implement, and that it was in itself quite ambitious. However, there were several disadvantages including the fact that Member States might move at different speeds and no common European standard would be produced.

3.3.6 Another relevant recommendation of the study was that the European Commission should review airspace design and make proposals, to ensure that any measures that that had a negative impact on the Single European Sky were not implemented.

MARKET ORGANISATION STUDY

3.3.7 A second study on the organisation of service provision (the market organisation study) considered mechanisms by which service provision could be made more efficient and cost effective, as well as the way that such monopoly services should be regulated. This study identified unbundling of air navigation services (ATM, CNS, AIS, MET) and consolidation as such potential mechanisms. It was recognised that, given the strategic nature of ATM and the associated sovereign implications, mergers and consolidations were not likely to happen except in the very long-term. However, FABs could provide a vehicle through which some of the benefits of consolidation, such as greater economies of scale, might be realised.

3.4 Draft Single European Sky Regulation

3.4.1 Taking into account the conclusions of the 2000 HLG and the Single Sky studies, in late 2001 the Commission proposed draft Regulations to implement the Single European Sky.

3.4.2 The draft Regulation on the organisation and use of airspace[3] required that a European Upper Flight Information Region (EUIR) be established and that the EUIR should be reconfigured into FABs. In the draft Regulation, FABs were proposed to:

- support efficiently the existing and future pattern of air traffic;

3 Proposal for a Regulation of the European Parliament and of the Council on the organisation and use of the airspace in the Single European Sky, proposed by the Commission 12 October 2001.

- ensure that each airspace block is designed to maximise the efficiency of European airspace as a whole;
- take into account the human and capital resources of various ANSPs;
- minimise the transaction costs between various area control centres; and
- ensure coherence between the existing and future configurations of upper and lower airspace.

3.4.3 The Regulation also stated that FABs should support the provision of ANS within ACCs of an optimal size, implying (but not specifically stating) that there might be significantly fewer ACCs in the future.

3.4.4 The draft Regulation also proposed that similar blocks be established in lower airspace, and that these should be consistent with the design of FABs for upper airspace. It also proposed harmonisation of operations and practices for approaches and departures of aircraft to/from airports, and movements on the apron.

3.4.5 Critically, the draft Regulation proposed that both FABs and the similar blocks that were to be created in lower airspace would be established by the Single Sky Committee, a Europe-wide body including representatives from each Member State, making decisions by majority voting. Therefore, the initial proposal of the European Commission was that FABs should be created by a decision of the whole Community and not only by the States involved.

3.4.6 The Commission's proposal for FABs was supported by the Parliament but opposed by the Council, which considered that the responsibility should remain at a national level and therefore that FABs should be introduced bottom-up and that only States involved in a FAB should decide about the creation of the FAB. The Regulations were eventually drafted on the basis that the introduction of FABs would be largely bottom-up but with some general requirements which would apply to all Member States, as set out below. This was subject to a review by the Commission of the progress made within 5 years after the entry into force of the SES Regulations (i.e. before 2009); the Commission might then re-visit the issue if inadequate progress had been made.

3.4.7 It must be noted that, by shifting from a Community decision to a decision from the States involved only, the objective of FAB has slightly shifted: initially due to be introduced by a proposal from the Commission to solve a particular issue, it is now an obligation for all States to create a FAB rather than trying to address specific cross-border operational issues.

3.5 Final Single European Sky Legislation

3.5.1 The legislative basis for the Single European Sky is set out in four Regulations which entered into force in 2004. The general objectives of the Regulations were to enhance current safety standards and overall efficiency for general air traffic management in Europe, to optimise capacity meeting the requirements of all airspace users, and to minimise delays. The Regulations are:

- the framework Regulation (549/2004), which sets out the general framework;
- the service provision Regulation (550/2004), which sets out the regulatory environment within which ANSPs would provide services;
- the airspace Regulation (551/2004), which describes how airspace should be organised and utilised within the Single European Sky; and

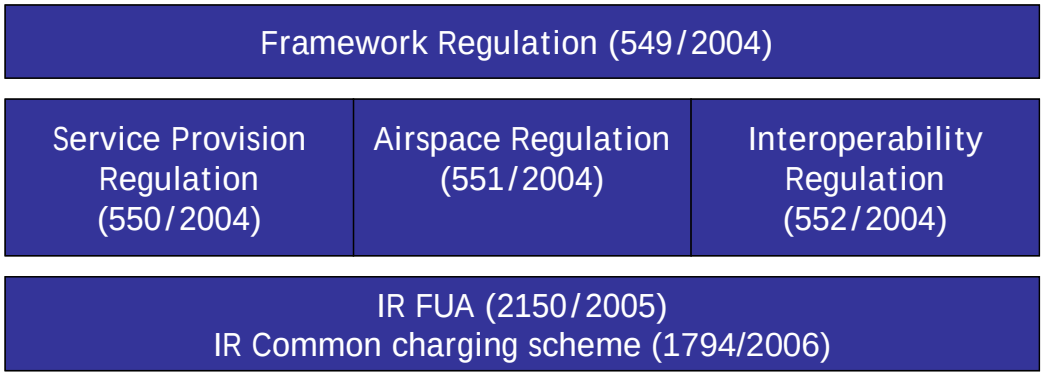
- the interoperability Regulation (552/2004), which sets out how interoperability would be achieved.

3.5.2 In addition, the following other Regulations produced implementing rules that include provisions which directly or indirectly relate to FABs:

- Regulation 2150/2005, which defined common rules for flexible use of airspace and;
- Regulation 1794/2006, on a common charging scheme for air navigation services.

3.5.3 This section explains the requirements of these Regulations as far as they relate to the establishment of FABs.

Figure 3-1: Overview of SES regulations with direct impact on FABs



3.6 Single Sky Regulations

3.6.1 This section summarises specific requirements for FABs that are set out in these Regulations. Most of the requirements relating to FABs were set out in the airspace Regulation (551/2004), which is outlined below.

3.6.2 The framework Regulation (549/2004) includes a number of definitions related to the Single European Sky. It defines a FAB as follows:

"an airspace block based on operational requirements, reflecting the need to ensure more integrated management of the airspace regardless of existing boundaries."

3.6.3 The service provision Regulation (550/2004) does not primarily relate to FABs, but it does include the following relevant requirements:

- Article 2(3): Where a FAB covers more than one Member State, Member States have to conclude an agreement on how to supervise the ANSPs providing services in the FAB. We interpret the second part of this Article to mean that this supervision can be cross-border provided that all of the Member States concerned agree, but the wording of this is not clear.
- Article 2(4): NSAs shall co-operate with each other to ensure adequate supervision of ANSPs from one Member State that also provide services in another Member State (this does not specifically refer to FABs, but would include a FAB if it was providing services).
- Article 8: Where there is a FAB, the Member States concerned shall jointly designate one or more service providers at least one month before the FAB comes into effect.

REGULATION 551/2004

3.6.4 The recitals to the airspace Regulation state that "progressively more integrated operating airspace should be established for en-route general air traffic in the upper airspace" and that "The reconfiguration of airspace should be based on operational requirements regardless of existing boundaries. Common general principles for creating uniform functional airspace blocks should be developed...". The word 'uniform' could imply that each FAB should have the same characteristics; although it could also be taken to mean that there should be uniformity within the FAB. In any case, recitals to Regulations are not legally binding and the text of the Regulation would always take precedence in the event of any divergence.

3.6.5 Article 5 of Regulation 551/2004 sets out the characteristics of FABs. The Regulation is entitled "Reconfiguration of the upper airspace" and gives the obligation to Member States to reconfigure their upper airspace into FABs. However, the Article does not limit FABs to upper airspace and should the Member States therefore wish to extend the FAB to lower airspace, they are free to do so.

3.6.6 Article 5(1) defines the general objectives: "With a view to achieving maximum capacity and efficiency of the air traffic management network within the single European sky, and with a view to maintaining a high level of safety, the upper airspace shall be reconfigured into functional airspace blocks." However it does not provide further information on what the characteristics of a FAB would be.

3.6.7 Article 5(2) sets out a number of requirements for FABs, including the requirements listed in Figure 3-2 below.

Figure 3-2: Article 5 requirements from airspace Regulation (EC) N°551/2004

Specific Requirements
Be supported by a safety case
Enable optimum use of airspace taking into account air traffic flows
Be justified by their overall added value, including optimal us of technical and human resources, on the basis of cost-benefit analysis
Ensure a fluent and flexible transfer of responsibility for ATC between ATS service units
Ensure compatibility between the configurations of upper and lower airspace
Comply with conditions stemming from regional agreements concluded within the ICAO
Respect regional agreements in existence on the date of entry into force of this Regulation, in particular those involving third countries

3.6.8 Article 5(3) states that common principles for the establishment and modification of FABs are to be drafted using powers under Article 8 of the Framework Regulation. These have not yet been developed – the 2007 Communication by the European Commission on the progress of Functional Airspace Blocks states that these will be developed later in the light of greater experience.

3.6.9 Article 5(4) states that FABs require agreement between the Member States concerned unless the FAB is declared by one Member State only, which is possible if the airspace concerned is under its sole responsibility. The legislation states that this can only happen after consultation with other interested parties, including the European Commission and other Member States. Article 5(5) states that agreements establishing FABs should also state how the FAB can be modified, how a Member State can withdraw, and what the transitional arrangements should be.

3.6.10 Article 5(6) states that, where there are difficulties within a FAB, the Member States concerned can bring this to the Single Sky Committee for an opinion which shall be taken into account, but will not be binding.

3.6.11 In a statement attached to the Airspace Regulation, the European Commission states that, "on the basis of a report on experience in implementing Article 5, the Commission will, if necessary, make proposals for amendment of the procedure […] within a period of five years".

OTHER REGULATIONS

3.6.12 Regulation 2150/2005, laying down common rules for the flexible use of airspace (FUA), does not specifically refer to FABs within the Articles of the Regulation but does contain a number of provisions which could affect FABs. In addition, the (non-binding) recitals to the Regulation include the statement that "consistent procedures for civil-military coordination and use of common airspace are an essential condition for the establishment of functional airspace blocks". The requirements of this Regulation which could relate to FABs are:

- Article 3(d) requires Member States to co-operate to ensure that FUA applies across national boundaries;
- Article 4(1)(h)→(k) requires Member States to develop cross-border airspace use, when needed due to traffic flows; co-ordinate airspace management policy with neighbouring Member States; and establish with neighbouring Member States one common set of standards for separation between civil and military flights for cross-border activities (this would not have to be as part of a FAB, but could be);
- Article 5(2) allows two or more Member States to establish a joint airspace management cell;
- Article 6(5) requires Member States to ensure that a common set of procedures is developed where cross-border activities take place.

3.6.13 The common charging scheme Regulation 1794/2006 set requirements for a common charging scheme for air navigation services. The objectives defined in recital 8 to the Regulation include allowing optimum use of airspace particularly within FABs; in recital 9, the Commission announces that when reviewing the creation of FABs five years after the entry into force of the SES Regulations, it will also assess the difficulties that may have arisen from maintaining separate unit rates within a FAB.

3.6.14 Article 4 requires that, if charging zones extend across the airspace of more than one Member State, as it could for a FAB, the Member States shall ensure consistency and uniform application of the Regulation to the zone; and that they shall notify the Commission and EUROCONTROL of these arrangements.

3.6.15 Moreover, it must be noted that the concept of charging zones is disconnected from the Flight Information Regions allowing a great deal of flexibility to organise air navigation charges within the FABs.

3.7 'Bottom-up' and 'Top-down' concepts

3.7.1 When discussing FABs, their potential creation and the SES legislation the summary descriptions of using a 'Bottom-up' or 'Top-down' approach are often used. However, it is important to understand that the existing legal framework, as well as the draft legislation, contained a mix of both approaches for different aspects of the establishment, implementation and modification of a FAB.

3.7.2 In Figure 3-3 below, we outline some of these key dimensions and how they were approached in both the draft and final SES legislation.

Figure 3-3: Illustration of 'Bottom-up' and 'Top-down' concepts

	Final Legislation	Draft legislation
Key objectives, scope and geographical coverage	***'Bottom-up'*** Member States and ANSPs	***'Top-down'*** Single Sky Committee (all Member States)
Final approval/ decision to create a FAB	***'Bottom-up'*** Member States	***'Top-down'*** Single Sky Committee (all Member States)
Common general principles for the establishment and modification of FABs (Implementing Rules pursuant to Art 5(3), AR)	***'Top-down'*** To be developed under mandate which has not yet been given to EUROCONTROL	***'Top-down'***
Guidance material (minimum requirements)	***'Top-down'*** Article 5 of the airspace regulation	***'Top-down'***

3.8 EUROCONTROL report on the EC's mandate to support the creation of FABs

3.8.1 In 2004, the Commission mandated EUROCONTROL to assist it in facilitating the establishment of FABs by:

- identifying key issues arising from the development of FABs and by supporting the development of "best practices"; and
- developing reference material containing opportunities and difficulties encountered with the establishment of FABs.

3.8.2 EUROCONTROL finalized its report in 2005. This report argued that FABs are a one-off window of opportunity to make improvements, but that Member States and ANSPs should be given sufficient time to analyse the issues that arise with their creation. It suggested that any issues should be addressed through established co-operative and collaborative processes and argued that stakeholder consultation had shown that this was feasible.

3.8.3 A key conclusion was that in some cases it might be operationally advantageous to extend the lower limit of the FAB below FL285, to include lower airspace.

3.8.4 It also recommended that:

- the military should be closely involved in negotiations from the outset;
- guidance material should be developed as soon as possible, including guidance for Member States on legal issues to be addressed in the creation of FABs;
- agreement is also necessary on principles to be followed in allocating costs and revenues where a FAB covers more than one Member State;
- negotiation on establishment of FABs should include discussion of consolidation of service provision as this may be the best solution, although it is not a formal requirement for the establishment of a FAB; and
- FABs provide an opportunity for technological convergence, although the existing technical infrastructure is sufficient to support FAB operational requirements.

3.9 FAB Workshop organised by DGTREN and Department for Transport UK

3.9.1 In early January 2006 a workshop was organised by DG TREN and the Department for Transport in the United Kingdom where industry stakeholders discussed FABs. The discussions were split into four working groups covering:

- charging issues;
- sovereignty, liability and related civil/military issues;
- NSA issues; and
- operational benefits and conditions for success.

3.9.2 The main conclusions of the meeting included an outline road map for Member States in creating a FAB initiative. Key requirements identified for the creation of the FAB initiative were:

- Safety is paramount when designing FABs;
- Activity to create the FAB needs to take place in parallel at ANSP, regulator and Member State levels;
- The military need to be involved in the FAB from the earliest point;
- ANSPs need to have open dialogue about the FAB with their staff and airspace users;
- The FAB must produce recognisable benefits and meet agreed operational requirements of the airspace;
- There must be agreement about the regulation of safety, the responsibility for liability and the co-operation between NSAs;
- There must be agreement on airspace structures and procedures;
- There must be agreement on the chosen charging structure for the FAB and its economic regulation (including any incentives); and
- Formal (legal) agreement between Member States must be secured to reflect their legal structures.

3.10 PRC report on the impact of the SES initiative on ATM performance

3.10.1 In response to a request from the European Commission, the PRC undertook an evaluation of the impact that the SES has had so far, and could have, on the performance of the European ATM system. The PRC produced its report in December 2006.

3.10.2 The PRC investigated the likely impact of FABs in terms of improvements of safety and efficiency. The PRC concluded that the then current FAB initiatives were not providing evidence of significant improvements which could address the identified performance shortfalls. The PRC identified several potential causes of this pessimistic outlook:

- lack of articulation of FAB objectives;
- the possibility of a lack of commitment from the participating Member States and from neighbouring States. This lack of commitment might also result from a lack of performance incentives;

- lack of common general principles and knowledge sharing, meaning that all FABs are different and therefore that each has to undertake significant development work;
- lack of performance indicators to show how "success" might be measured;
- a wide range of institutional, political and social constraints, including legal, liability, employment of foreign controllers, social considerations, etc

3.10.3 The PRC made a number of recommendations relating to FABs:

- the objectives of FABs should be clearer;
- there should be EU financial support for the creation of FABs when it is appropriate (in the short term);
- as foreseen in Article 5(3) of Regulation 551/2004, common general principles for FABs should be defined;
- indicators should be developed to assess the performance improvement that FABs deliver;
- as foreseen in Article 6(2) of Regulation 551/2004, implementation rules for optimised route and sector design should be developed;
- in the medium term, the mechanism for creation of FABs should be reassessed; and
- in the longer term, the process for route and sector design should be reassessed.

3.10.4 In its executive summary, the PRC also called for "a genuine network optimisation of route and sector design in parallel to the development of FABs in order to improve flight-efficiency and use of airspace". The PRC concluded that a regional approach through creation of FABs would not be enough to optimize the European route network and that a European approach is needed for this particular objective.

3.11 Joint statements from CANSO and ETF on Functional Airspace Block

3.11.1 The Civil Air Navigation Services Organisation (CANSO) and the European Transport Workers' Association (ETF) organised two conferences to discuss FABs: the first was held in Sicily (September 2004) the second was held in France (October 2007).

3.11.2 At the time of the 2004 conference, the discussion of ideas, scope and requirements of the FABs were being developed. High level themes to emerge from that conference included:

- The impact of the SES on the organisation of ANSPs and their staff will be massive;
- Successful FABs would require the development of harmonisation, integration and interoperability;
- One size of FAB will not fit all circumstances; and
- The implementation of FABs will bring additional costs which will have to be outweighed by the benefits.

3.11.3 The conference in 2007 resulted in a joint statement in which:

- CANSO and ETF confirmed the primacy of safety in Air Traffic Management;

- They believe that enhancement of ATM services is best achieved through the 'bottom-up' approach;
- Full involvement of staff is a key to the success of FABs;
- The primary aim of a FAB is to increase overall ATM performance: balancing the objectives of capacity, cost-effectiveness, flight efficiency and the environmental impact;
- The best way to reduce fragmentation is to improve co-operation and strengthen convergence; and
- The European Commission and Member States should remove obstacles to the development of FABs by facilitating a common understanding of the objectives of ANSPs and Member States.

3.12 Communication from the Commission: A mid-term status report on the building of the SES through FABs (2007)

3.12.1 The European Commission issued a mid-term status report on the progress of implementation of FABs in 2007. Its main conclusions were:

- different FABs were at a different stage of development;
- tangible results in terms of capacity increase and cost reduction were modest;
- as some FABs included both upper and lower airspace, there should be significant scope for improvement through integration, perhaps including the consolidation of ACCs;
- areas of responsibility of FABs are on average larger than those of US ACCs, but not by a substantial proportion (the average US ACC controls over 70% of the total flight-hours of a FAB); and
- establishment of FABs required strategic rethinking of the organisation of ANS at a regional level, but that this had not taken place at the speed necessary to deliver clear results by 2008.

3.12.2 The Commission also stated the criteria it would adopt to review the progress of FABs in 2008. It noted that users expect significant increase in performance in terms of safety, capacity and cost-efficiency. Member States should be able to demonstrate a "qualitative leap" in terms of flight-efficiency and cost-effectiveness, whilst maintaining safety and demonstrate a roadmap towards integrated management. It also emphasised the importance of the development of performance indicators.

3.12.3 In summary, the Commission considered that Member States needed to accelerate their efforts to produce meaningful results by 2008. It also stated that it would review the effectiveness of the "bottom-up" approach to implementation of FABs in the light of the progress that had been achieved.

3.13 High Level Group report 2007

3.13.1 A further HLG was convened in 2006 to provide a vision for the future of aviation regulation in Europe, concentrating on ATM. The HLG produced its report in July 2007.

3.13.2 The HLG noted that progress with the implementation of the SES has been slow. In order to accelerate this, it recommended:

- an SES implementation strategy and plan should be developed, which should define which functions should be carried out at a national level, European level or intermediate (FAB) level;
- an Aviation System Co-ordinator to drive forward change;
- develop legislation to support the implementation of FABs;
- incentivise better ANSP performance – although through greater transparency with monitoring and benchmarking, rather than through direct financial incentives;
- facilitate the success of SESAR; and
- engage the military more effectively.

3.13.3 The HLG identifies slow progress with FABs as a particular issue. It notes that the development of FABs is mandatory and that (at the time the HLG report was drafted) six were in development. The report also notes that airlines have expressed frustration with the slow progress of the development of FABs in general. It identifies six hurdles which have to be overcome:

- **Definitions:** There is no consensus on the definition of a FAB and therefore different FABs may have different objectives.
- **Political and legal:** Member States perceive that FABs will result in them losing sovereignty, and there is also no agreement on how liability issues would be resolved for cross-border ATM.
- **Governance issues:** ANSPs have different governance structures and this does not facilitate cross-border co-operation.
- **Airspace and operational:** Development of new air routes within FABs is a cumbersome process. These processes often require co-operation with the military across the states.
- **Financial and technical:** The business case is not yet strong enough.
- **Human resources:** Variation in salaries, benefits etc are highlighted by the creation of FABs.

3.13.4 The HLG states that only the Member States, rather than the ANSPs, can solve these problems, but that this would require consistent guidelines to be provided to both Member States and ANSPs at European level. In the context of the identified FAB issues, it recommends:

- clarification of the existing legal framework – also by addressing the liability issue;
- provision of a clear definition of a FAB concept, whilst accepting there may be variations;
- provision of guidance based on the experience of FABs that are in progress;
- that, to encourage progress, the PRC should be mandated to undertake an annual progress review, and the European Commission should undertake its own formal assessment in 2008 and 2010;
- an increase in the political commitment to FABs, in order to be able to address blocking issues such as sovereignty concerns;
- the facilitation of information exchange so that FABs can learn lessons from each other.

3.14 SES II, Communication and amendments to SES I (2008)

3.14.1 On 25 June 2008, the European Commission adopted a Communication entitled "Single European Sky II: towards more sustainable and better performing aviation" and suggested amendments to the Regulations of SES I. It describes the current situation of growing demand and increasing pressure on environmental performance of the industry. One of the key challenges for the aviation industry will be to achieve a sustainable industry and the Communication highlights the potential to fly more direct routings as a goal for air traffic management. It also recognises that the "current self-regulatory regime" (p5 Communication), leads to a variety of performance outcomes across the metrics of safety, flight efficiency, capacity/ delays and cost efficiency.

3.14.2 The Communication describes a package of proposals for improving the current situation:

- **First Pillar: Regulating performance**: to strengthen the existing SES legislation it introduces a system of performance regulation through the setting of binding targets to be overseen by National Supervisory Authorities. It also introduces initiatives to integrate service provision within Function Airspace Blocks, and strengthen the Network Management function.
- **Second Pillar: A Single Safety Framework**: to extend the competencies of EASA to the key safety fields of aerodromes and ATM/ ANS.
- **Third Pillar: Opening the door to new technologies**: this describes the Commission's intention to prepare a proposal for a European ATM Master Plan through the SESAR Joint Undertaking. The SESAR deployment process will require appropriate governance structures for which the Commission will make a proposal.
- **Fourth Pillar: Managing capacity on the ground**: highlights the need for airport infrastructure investment to keep pace with air traffic management capacity to accommodate growing demand. The action plan includes: better use of existing facilities; improved infrastructure planning; promoting intermodality and improving access to airports and establishing a Community Observatory on airports capacity.

3.14.3 In relation to Functional Airspace Blocks the Commission has confirmed that it will retain, for the time being, its 'bottom-up' approach. It will support current FAB initiatives by:

- "….Setting firm deadlines for implementation (at the latest by end 2012);
- Extending the scope to lower airspace up to the airport;
- Clearing national legal and institutional obstacles." (p8 Communication)

3.14.4 There are a number of recommended amendments to the Regulations of the Single European Sky, in relation to this study the following are the most important. The main changes include:

- **Amending the definition of a FAB in the Framework Regulation 549/2004**: "…'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 ancillary functions are optimised and / or integrated" (p6 amending regulations text).

- **Requiring an agreement on Supervision arrangements for FABS in the Service Provision Regulation 550/2004**: "…In respect of functional airspace blocks that extend across the airspace falling under the responsibility of more than one Member State, the Member States concerned shall conclude an agreement on the supervision provided for in this Article with regard to air navigation service providers providing services relating to these blocks. Further, these Member States shall endeavour to conclude an agreement on the supervision provided for in this Article, mutually recognising the supervision tasks already undertaken, also with regard to air navigation service providers providing services in a Member State other than that in which they have their principle place of operation" (p10).
- **Moving the article related to FABs from the airspace Regulation 551/2004 into a new article 9a the service provision Regulation 550/2004**: "Member States shall take all necessary measures in order to ensure the establishment of functional airspace blocks as soon as possible and at the latest by the end of 2012 with a view to achieving maximum capacity and efficiency of the air navigation management network within the single European sky and maintaining a high level of safety and contributing to the overall performance of the air transport system and a reduced environmental impact. Member States shall co-operate with each other to the fullest extent possible in order to ensure compliance with this provision". (p11).
- **Amending some of the objectives by** using the words "smooth and flexible" rather than "fluent and flexible" use of airspace; and by using the words "compatibility between different airspace configurations" rather than distinguishing between upper and lower airspace
- **Reinforcing the consultation phase with the European Commission and Member States during the declaration of the FAB**: "Before establishing a functional airspace block the Member State(s) concerned shall provide the Commission, the other Member States and other interested parties with adequate information in order to assess its conformity with the criteria referred to in paragraph 2 and give them the opportunity to submit their observations"(p.12).
- **Replacing the development of "common general principles for the establishment and modification of FABs" (former Article 5(3) of the airspace Regulation) by the development of implementing rules of a more general nature (Article 9a(7) of proposed service provision Regulation)**: "The Commission shall adopt detailed implementing rules for this Article in accordance with Article 8 of the framework Regulation" (p12).

3.14.5 In summary, the SES II amendments provide a clear deadline to create FABs, the scope of which is encouraged to include service provision as well as airspace design. The scope of airspace is extended to lower as well as upper airspace and implementing rules will be adopted to support the creation of FABs. Greater obligation to consult on the FAB with other Member States and stakeholders is also introduced.

3.15 Conclusions

3.15.1 The concept of FABs dates back to the High Level Group report in 2000 and the subsequent studies on the Single European Sky.

3.15.2 The implicit political objective appears to have been cross-border rationalisation and consolidation of airspace in order to reduce fragmentation, but this has implications for service provision (as identified in the 2000 HLG Report) which, due to political

constraints, were not spelt out in the final legislation. The Commission's original proposal was for FABs to be designated by the Single Sky Committee making decisions through majority voting, but this was not accepted by the Council, and therefore the creation and implementation of FABs, although mandatory, is left to the Member States.

3.15.3 According to its statement attached to the Airspace regulation, the Commission will review FAB initiatives within five years after implementation (i.e. before 2009), and if necessary make proposals for amendments to the procedures provided in Article 5.

3.15.4 Airspace reconfiguration is the main legislative requirement of FABs, with a framework for enabling their creation through mandatory requirements covering issues such as safety case and cost benefit analysis. However, FAB implementation is left to Member States through the 'bottom up' approach.

3.15.5 Following discussions in the Council where Member States wanted to retain maximum possible flexibility, there is little guidance in the legislation on the process that Member States have to follow in order to establish and modify FABs, and although the Regulation refers to common general principles for the creation and modification of FABs, these have not been drafted as yet. As a result, some critical issues have not been addressed.

3.15.6 The Single Sky studies also identified that the introduction of FABs was ambitious, and would require political commitment.

3.15.7 This report uses the requirements set out in the Single European Sky I legislation for its assessment as highlighted in the text box below.

The framework Regulation 549/2004 defines a FAB as *"an airspace block based on operational requirements, reflecting the need to ensure more integrated management of the airspace regardless of existing boundaries."*

Article 5(1) of the airspace Regulation 551/2004 sets out the objectives of FABs as follows in the following way: "*With a view to achieving maximum capacity and efficiency of the air traffic management network within the single European sky, and with a view to maintaining a high level of safety, the upper airspace shall be reconfigured into functional airspace blocks*".

Article 5(2) sets out a number of mandatory requirements for FABs: FABs shall, *inter alia*:

- Be supported by a safety case
- Enable optimum use of airspace taking into account air traffic flows
- Be justified by their overall added value, including optimal us of technical and human resources, on the basis of cost-benefit analysis
- Ensure a fluent and flexible transfer of responsibility for ATC between ATS service units
- Ensure compatibility between the configurations of upper and lower airspace
- Comply with conditions stemming from regional agreements concluded within the ICAO
- Respect regional agreements in existence on the date of entry into force of this Regulation, in particular those involving third countries

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4 A DESCRIPTION OF THE NINE DECLARED FABs

4.1 Introduction

4.1.1 At present, there are nine FAB initiatives that have been notified to the European Commission, listed in Figure 4-1. In this chapter we provide a description of each of the FABs, covering:

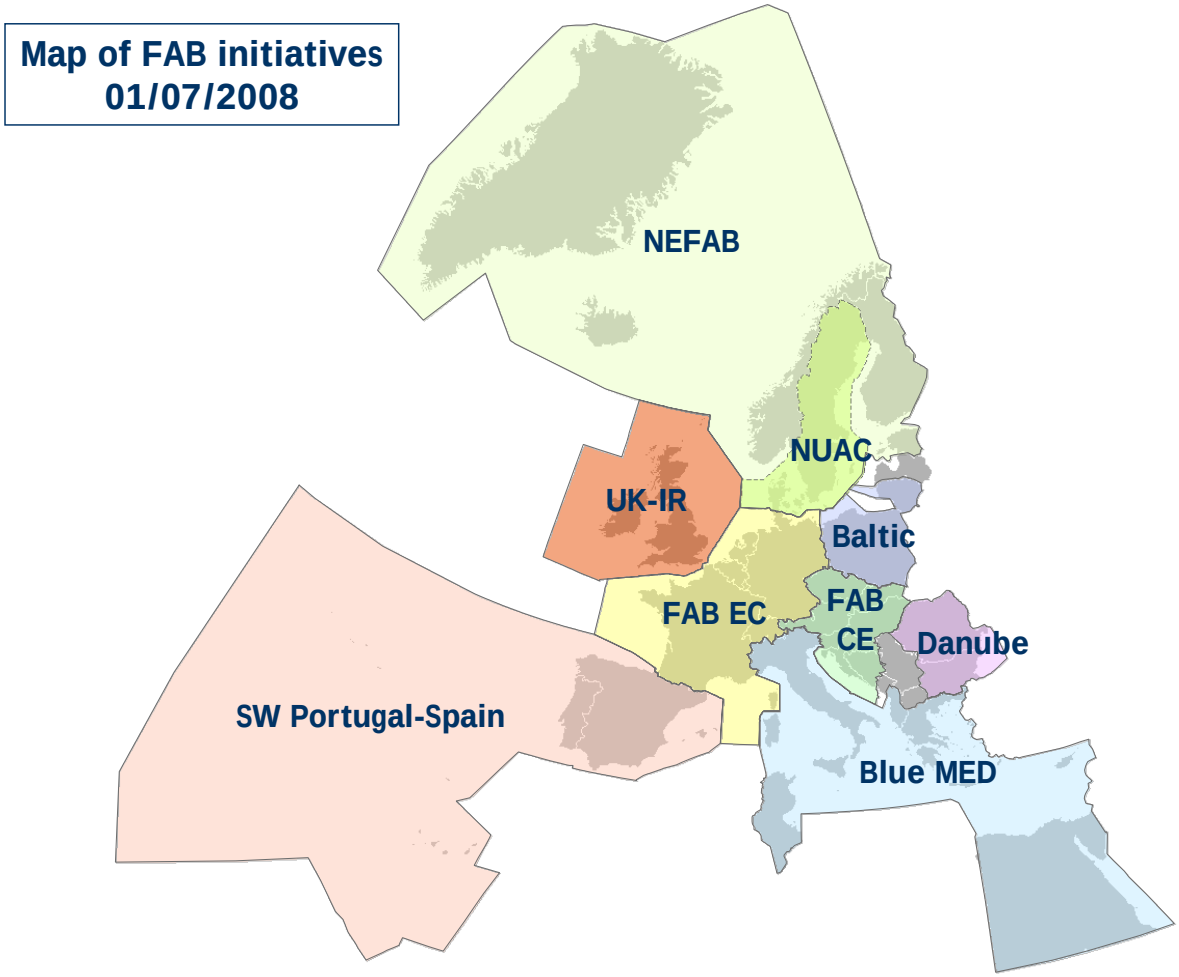
- The context and history of the FAB;
- The airspace and geography of the FAB;
- The development of the FAB;
- The existing operational concepts used;
- Changes planned for the FAB and the arrangement for their introduction;
- Timescales;
- Key priority areas for the FAB;
- The size of potential benefits;
- Key performance indicators;
- Governance arrangements;
- Airspace users' views;
- Staff views; and
- PRC assessment.

Figure 4-1: The current initiatives (as of 1 July 2008)

Programme name	Participating States
Baltic FAB	Poland, Lithuania
Blue Med	Italy, Greece, Cyprus, Malta (Tunisia, Egypt and Albania as Associate Partners, Kingdom Jordan as observer)
Danube FAB	Bulgaria, Romania
FAB Central Europe	Austria, Czech Republic, Croatia, Hungary, Slovak Republic, Slovenia, Bosnia & Herzegovina
FAB Europe Central	France, Germany, Switzerland, Belgium, Netherlands, Luxembourg, (United Kingdom as collaborative partner)
NUAC Programme	Denmark, Sweden
NEFAB	Norway, Finland, Estonia, Iceland, Denmark, Sweden
SW Portugal-Spain FAB	Spain, Portugal
FAB UK Ireland	United- Kingdom, Ireland

4.1.2 The geographical scope of the initiatives, as of 1 July 2008, is shown in Figure 4-2 below.

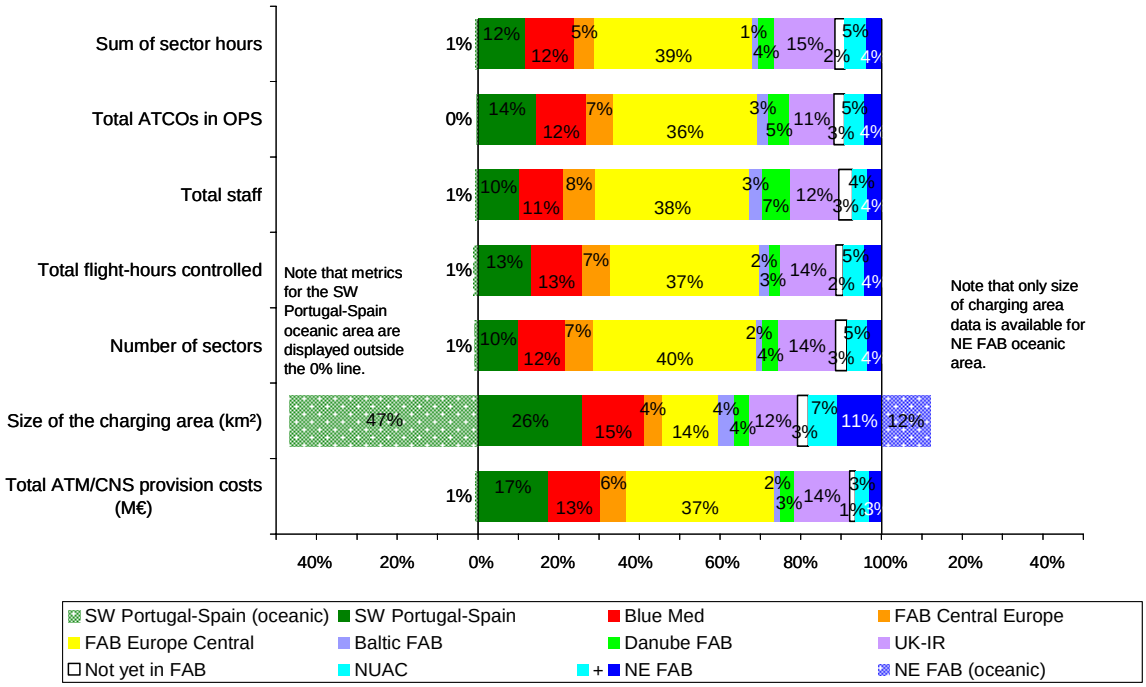
Figure 4-2: Geographical scope of the FAB initiatives



4.1.3 The size of the existing FAB initiatives varies significantly (Figure 4-3 below). The geographical scope that has been used for this figure covers the 27 EU States as well as Norway, Switzerland, Serbia and Montenegro, FYROM and Albania.

4.1.4 Depending on the metric used, the largest FAB initiative is between 13 and 32 times larger than the smallest initiative. FAB EC, which accounts for 37% of flight-hours controlled, is the largest FAB initiative on every metric apart from the size of the charging area controlled, on which NEFAB is the largest initiative. Baltic FAB, which accounts for 2% of flight-hours controlled, is the smallest FAB initiative on every metric other than the size of the charging area controlled, on which Danube is the smallest initiative. Oceanic airspace for SW Portugal-Spain and the NEFAB initiatives has a significant impact on the airspace controlled measures.

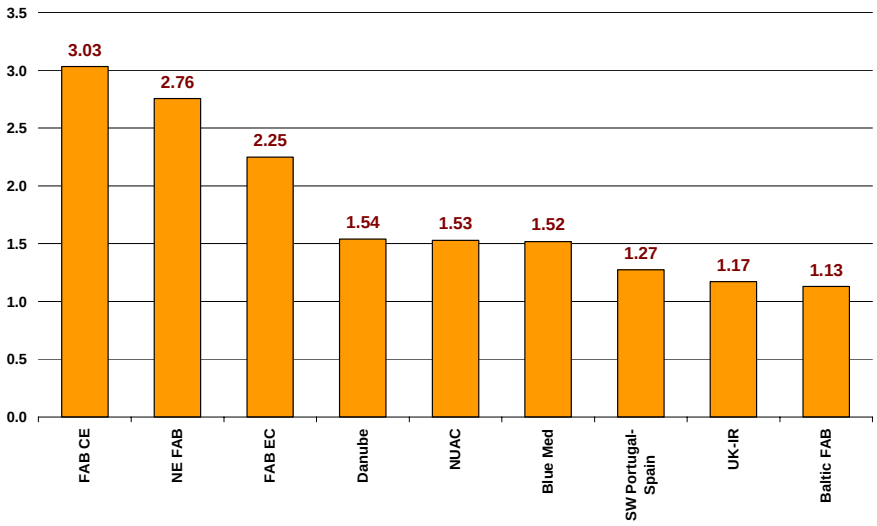
Figure 4-3: Scale of the FAB initiatives



Note: This figure is based on ACE 2006 data.

4.1.5 Five of the nine FABs involve only 2 Member States. Of these five, two-state FABs most involve a large and small ANSP (as measured by the number of flight-hours operated). FAB CE has the largest number of States (seven), and FAB EC and NEFAB each involve six States. In the figure below we show the results of the aggregation factor which measures (FAB size/max ANSP size) in terms of flight-hours. In other words, the total flight-hours within the FAB CE are three times larger than the flight-hours of its largest member (Austro Control).

Figure 4-4: Aggregation factor (Flight-hours in the FAB/Flight-hours of the largest ANSP)



AIRSPACE NOT COVERED BY FAB INITIATIVES

4.1.6 The Single Sky Regulations require that upper airspace within the EUR and AFI ICAO regions must be reconfigured into FABs. In addition to the EU Member States, the SES Regulations are binding on States that have entered into bilateral

or multilateral air transport agreements with the EU[4]. These States include Norway, Switzerland, the Balkan countries and Iceland, although Iceland is not obliged to form a FAB because it is not within EUR or AFI airspace[5]. However, at present, of the States that are committed to develop FABs, the following were not participating in any FAB initiative at 1 July 2008:

- Latvia;
- Serbia;
- Montenegro; and
- Former Yugoslav Republic of Macedonia (FYROM).

4.1.7 Albania is currently an associate partner in the Blue Med FAB.

4.1.8 Latvia has undertaken discussions with the Baltic initiative and its ANSP did sign a Memorandum of Understanding with the ANSPs of Poland and Lithuania, but did not sign at CAA or State level. Latvia is currently not part of the Baltic FAB. However, Latvia is participating as an observer in the North European ANSP Cooperation (NEAP).

4.1.9 Serbia, Montenegro, FYROM and Albania are participating in the ISIS initiative[6] which was originally planned to be a FAB but is no longer being taken forward in this form.

OTHER PROPOSALS RELATED TO FABS

4.1.10 In addition to the nine FAB initiatives, there are two staff-led proposals which are not FABs but either share some characteristics or provide an overall framework to be used when developing FABs:

- **ETF Co-op Model:** This is the European Transport Workers' Federation (ETF) vision in the short and long term perspective, for sustainable FABs all over Europe and beyond. It proposes an overall framework based on effective cooperation among ANSPs, making best use of existing resources, infrastructure and facilities.
- **MOSAIC:** This initiative is promoted by the Air Traffic Controllers European Unions Coordination (ATCEUC). It proposes an integration of the ANSPs involved in the FAB EC, plus Austria and Italy, organised as an international public service.

4.1.11 These two proposals are presented in Annex III.

4.2 Status at 1 July 2008

4.2.1 This section provides an overview of the status of declared FAB initiatives, ordered alphabetically, at 1 July 2008. Where data or information have been provided after 1 July we have, where possible, reflected it in the drafting. Tasks that have been undertaken at this date and expected timescales towards implementation are discussed in more detail below.

4 Decision 2006/682/EC published on 16 October 2006 in the Official Journal of the European Union. States which have signed this Agreement comprise the Republic of Albania, Bosnia and Herzegovina, the Republic of Bulgaria, the Republic of Croatia, the Former Yugoslav Republic of Macedonia, the Republic of Iceland, the Republic of Montenegro, the Kingdom of Norway, Romania and the Republic of Serbia.

5 Iceland may still include its airspace in a FAB if it wishes to do so, under Article 1(3) of the Airspace Regulation.

6 ISIS is the former SEEFAB initiative, its focus is on implementing the requirements of SES, and it no longer has a primary objective to create a FAB.

4.3 Baltic FAB

CONTEXT AND HISTORY

4.3.1 The Baltic FAB initiative has been instigated by its Air Navigation Service Providers (ANSPs) – PANSA (previously PPL PATA) in Poland and Oro Navigacija in Lithuania. The geopolitical situation and context of this initiative (See Figure 4-5 below) put a constraint on the future development of the FAB given the fact that the Kaliningrad Region of the Russian Federation is located between Poland and Lithuania.

4.3.2 Some initial work started under ICAO in 1999, and at that time, the Russian Federation was included as an observer. In 2003, a Memorandum of Understanding for Harmonisation and Integration of Components of the Air Navigation Services in the Baltic Sea Area was signed between the ANSPs of Poland, Lithuania and Latvia. In 2004 a Memorandum of Cooperation was signed between the Civil Aviation Authorities of Poland and Lithuania. The two countries are also Members of the Baltic Air Navigation Services Commission (BANC) was created between those countries.

4.3.3 Latvia was part of the initial work programme, however over time they have reduced their involvement and did not sign the Memorandum of Cooperation at CAA level and are not actively involved with the Baltic FAB.

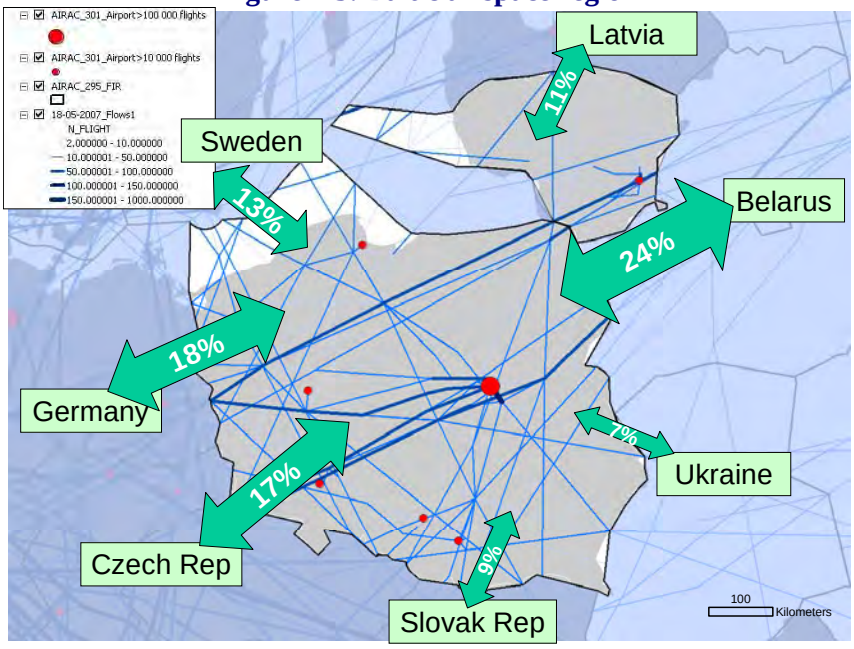
4.3.4 Estonia joined the North European ANSP co-operation initiative and NEFAB initiative as part of it.

4.3.5 Nine States: Norway, Sweden, Finland, Belarus, Estonia, Latvia, Lithuania and Russia (including the Kaliningrad ACC) take part in regular informal ATM meetings where the best practices in the CNS/ATM domain are shared between the ANSPs' representatives.

SCOPE: AIRSPACE AND GEOGRAPHY OF THE FAB

4.3.6 The existing organisation of the airspace which forms the Baltic FAB is shown in Figure 4-5 below. It shows that key flows lie between Western Germany and Poland from the south west to Belarus to the north east of the FAB.

Figure 4-5: Baltic airspace region



DEVELOPMENT OF THE FAB

4.3.7 The Baltic FAB will cover the international airspace over the Baltic Sea and the national airspace of the two Member States: Poland and Lithuania with a common border of only 69 km, and two entry and exit points. The two ANSPs are already working in close co-operation. They have the same separation distances and procedures, share civil and military radar data, OLDI, and regional planning. The FAB would cover both Upper and Lower airspace. However, only 60% of the flows in the Warsaw and Vilnius FIRs will be covered.

4.3.8 If the FAB was able to include the Kaliningrad Region, there would be significant additional benefits such as a greater common border (428 km), and 100% of flows in Warsaw and Vilnius FIRs covered. Including Belarus (or part of its airspace) in the FAB Baltic could also benefit the efficiency of airspace use in the area.

4.3.9 However, Kaliningrad and Belarus if they were to join Baltic FAB would need to redesign their airspace as they currently have different airspace design and classification, different separation rules and procedures, require special permission to transit the region (with 30 days notice), and have some parts of the airspace classified as military.

4.3.10 The requirements to include Kaliningrad and Belarus as well as implementing the changes are largely political and require the EU to discuss with the Russian Federation. In the event that Kaliningrad was included in the Baltic FAB, airspace management and ATM issues might be impacted by the mix of NATO and non-NATO States.

4.3.11 On 20 June 2008, PANSA supported by Oro Navigacija applied for the co-funding from the TEN-T budget for a "Feasibility study for establishing the Baltic FAB". The feasibility study is designed to assess possible scenarios for the development of the Baltic FAB. The scenarios will look at the potential to include neighbouring FIRs and develop smooth interfaces between other FAB initiatives in the region, to ensure the interoperability of the ATM network in this part of Europe.

EXISTING OPERATIONAL CONCEPTS

4.3.12 Based on the ICAO Global ATM Operational Concept (Doc 9854), the PRC has extracted some key components for the creation of FABs (see Annex II). The following four elements are used to provide a brief description of the existing operational concepts in each FAB's ANSP:

- **En-route civil-military arrangements**: PANSA and ORO Navigacija provide services to GAT and OAT..
- **Staff management in civil ANSPs**: PANSA is based on a team with overtime, whereas ORO Navigacija is based on a team with no overtime.
- **Characteristics of pre-tactical ATFCM/ ASM services**: PANSA has 1 Airspace Management Cell and 1 FMP position, ORO Navigacija has 1 FMP position.
- **Civil ACC main functions**: PANSA has 1 ACC performing En-route services in Warsaw). Stand alone radar units are used for approach covering local TMAs at four major airports and the Warsaw APP. ORO Navigacija has one ACC and approach services are provided locally.

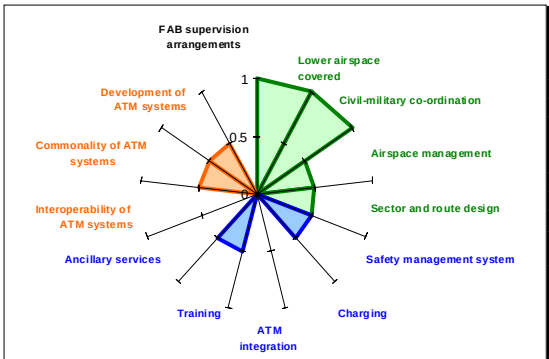
4.3.13 There are many similarities between the existing operational concepts employed by Poland and Lithuania, meaning that only limited changes would need to be made to facilitate the FAB in these areas. There are no specific military issues for both States.

4.3.14 Reflecting their existing level of co-operation, the ANSPs and States already have harmonised safety requirements and safety management methodology.

CHANGES PLANNED FOR THE FAB AND ARRANGEMENTS FOR THEIR INTRODUCTION

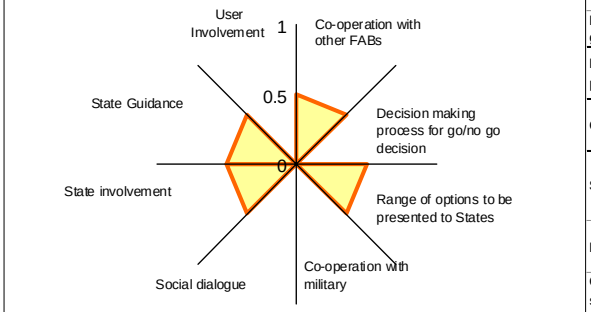
4.3.15 In Figure 4-6 and Figure 4-7 we present two frameworks for the Baltic FAB. The first describes the key changes planned to be introduced by the FAB, the second describes the arrangement for achieving these changes.

Figure 4-6: Changes planned by the FAB



Characteristic	Justification
Lower airspace covered	Lower airspace will be covered
Civil-Military coordination	Have discussed airspace management cell to be based in Warsaw to cover all Military interaction
Airspace management	There is a plan to establish a sub-regional AMC
Sector and route design	There is already close co-operation in this area
Safety Management System	Harmonised safety requirments and methodology are in place and subject to refinement
Charging	No common charging arrangements planned
ATM integration	No intention to merge ACCs
Training	Training schemes will be co-ordinated
Ancillary services	No changes as result of FAB (some from SESAR)
Interoperability of ATM systems	No changes as result of FAB (some from SESAR)
Commonality of ATM systems	No changes as result of FAB until the end of the lifecycle of the system in 2018
Development of ATM systems	Only considered for new equipment, otherwise is likely to continue with two distinct suppliers (investment lifecycle will determine timing)
FAB Supervision Arrangements	A number of options are under consideration, but the role of EASA needs to be clarified first

Figure 4-7: Arrangements for introduction of the FAB



Arrangement	Justification
Co-operation with other FABs	Regular discussions with other States (Latvia, Estonia), Russian Federation, Belarus, NUAC. FAB has raised concerns about interaction with FAB EC (Germany-Poland)
Decision making process for go/no go decision	Yet to be decided, after the feasibility study phase
Range of options to be presented to States	A range of options is under consideration in terms of scope of the airspace, but Kalingrad remains a constant issue
Co-operation with military	This is not a issue being addressed through the FAB, as there are already well established civil-military arrangements between the two States
Social dialogue	There will not be any social dialogue before the FAB is more mature. However the trade unions are aware of the ongoing work. BANC decided to start the process in October 2008
Involvement of States	Through the CAAs, the States are heavily involved. The Minister supported the TEN-T application for the feasibility study
Guidance from States to start and support FAB discussions	The guidance from the States comes from the signed MoU and the MoC. Both States have started the process for establishing targets for the FAB
Involvement of users	Little involvement of users to date. In October 2008, BANC decided to start the process of formal consultation with users

TIMESCALES

4.3.16 We currently only have limited information on the timescale for the FAB Baltic initiative:

- Earlier FAB initiative (Poland, Lithuania and Latvia): begun 6 December 2004;
- Proposal and Inception: 1 April 2006;
- Feasibility assessment: Started beginning of 2007. Aims at completion by end of November 2008 (initial assessment) and by Q1 2010 (full feasibility study);

- Decision in principle by the ANSPs: unknown; Q2 2010, based on Feasibility Study;
- Preparation for implementation: 2011;
- Implementation: 2012-13;
- Operations started: 2014: Poland and Lithuania believe it should be tied into the timeline for SESAR (technical integration (common system) in 2018, however the target deadline set as a part of SES II will be taken into consideration.

KEY PRIORITY AREAS FOR THE FAB

4.3.17 Without the results of the Feasibility Study, there is only limited information available about the possible changes to be introduced by the Baltic FAB.

4.3.18 However, on the basis of the documentation reviewed and the stakeholder meeting we understand the following areas are being investigated:

- Airspace design, management and geography would look at building upon close co-operation for lower and upper airspace;
- Implement EUROCONTROL's interoperability plans;
- Equipment commonality will only be considered for new equipment purchases; and
- Some level of support functions co-operation.

4.3.19 At this stage, the FAB initiative would not merge ACCs. Initially, there would not be any common charging arrangements, no changes to the current training and staffing policies. The approach to the provision of ancillary services would not change either.

4.3.20 The Baltic FAB initiative believes that their planning needs to be synchronised with SESAR implementation in order to take advantage of full lifecycle cost of systems and harmonised implementation of ATM Service Levels e.g. capability level 3 around 2018), but any time target set as part of SES II will be taken into consideration. This is particularly the case given that PANSA will be implementing a new system in 2010.

SIZE OF POTENTIAL BENEFITS

4.3.21 As in-depth work on the study has not yet been undertaken, potential benefits have not been quantified.

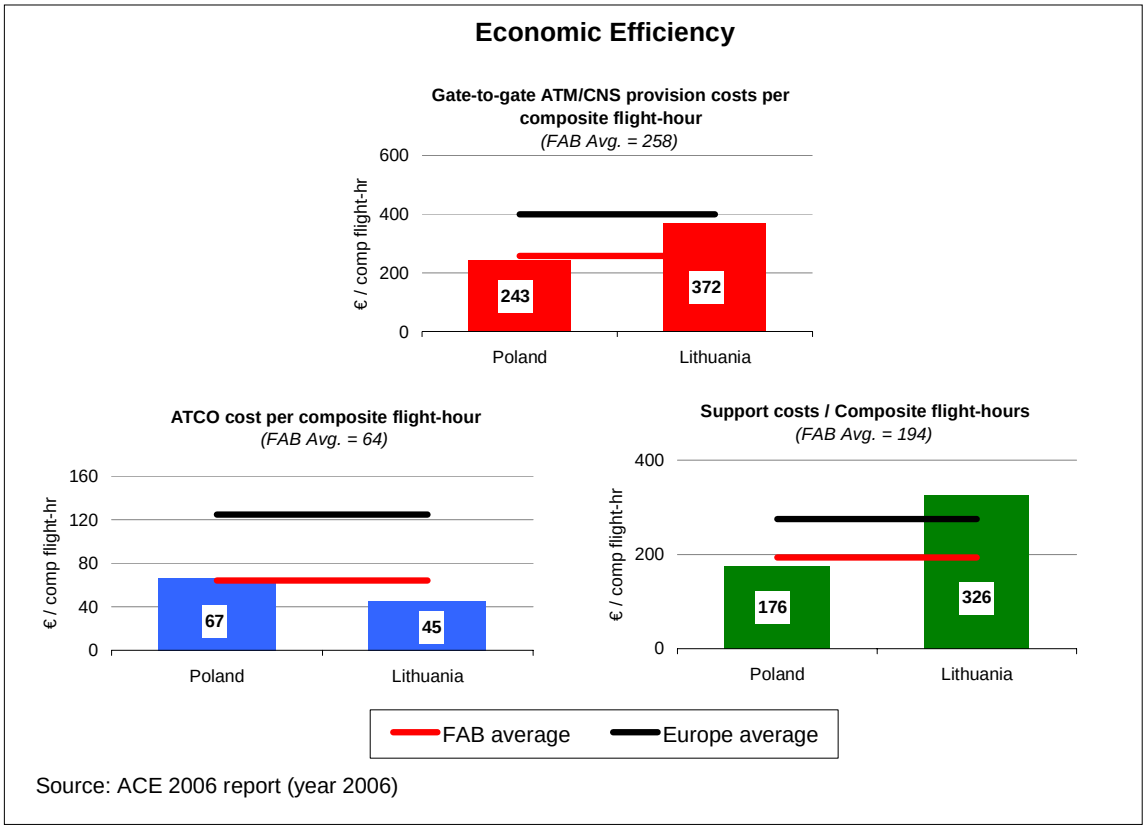
4.3.22 However, if the FAB only covered Lithuania and Poland, the FAB States concerned believe that the benefits would principally come from synergies of best practice and procurement strategies. The PRC's assessment is that the size of these benefits might be small, as only limited airspace could be addressed.

KEY PERFORMANCE INDICATORS

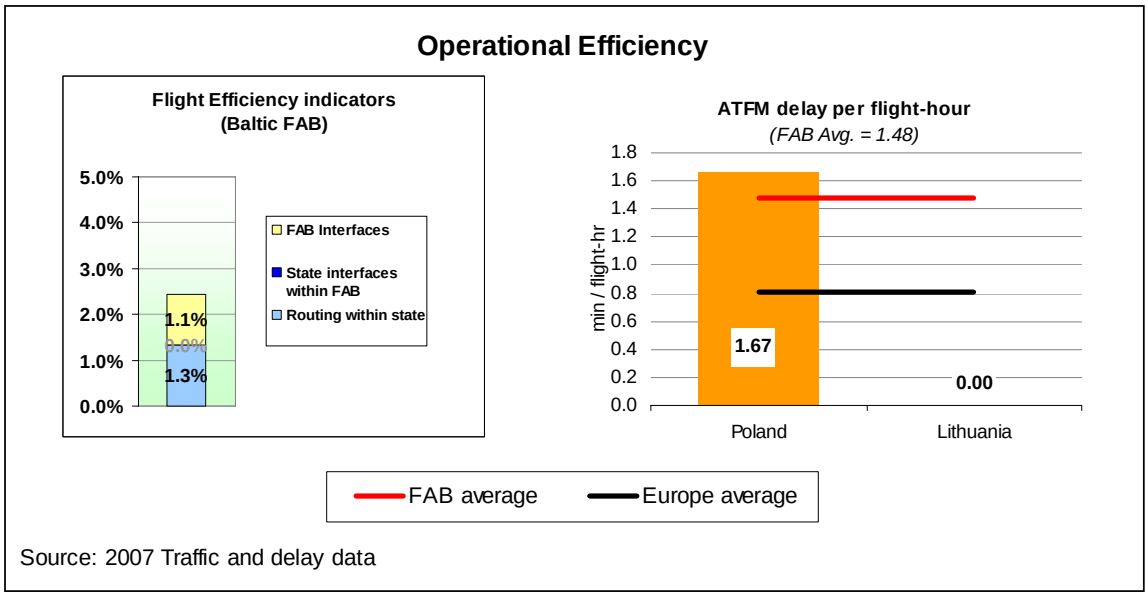
4.3.23 Figure 4-8 below shows the primary key performance indicators for cost-efficiency, operational efficiency and safety for the Baltic FAB.

4.3.24 Poland has a relatively high level of ATFM delay related to limitations of ATC capacity in Poland. This is expected be addressed through implementation of a new ATM system in Poland in 2010. However, a substantial volume of non-regulated traffic (approximately 30%) comes from outside the IFPS zone. This might negatively affect the FAB's performance.

Figure 4-8: Baltic Key Performance Indicators



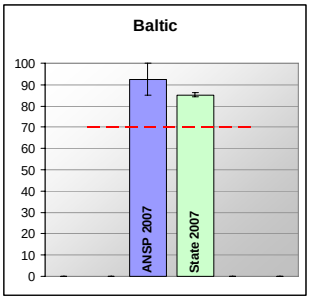
Source: ACE 2006 report (year 2006)



Source: 2007 Traffic and delay data

Safety

Safety Maturity

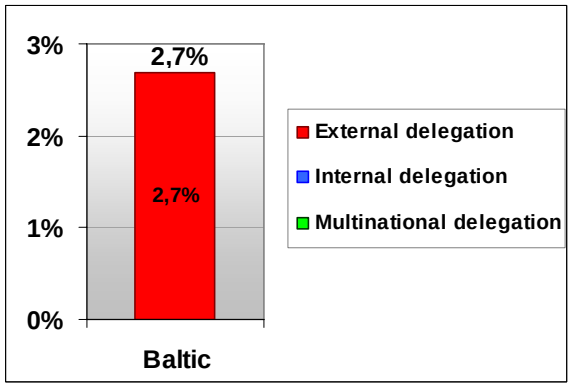


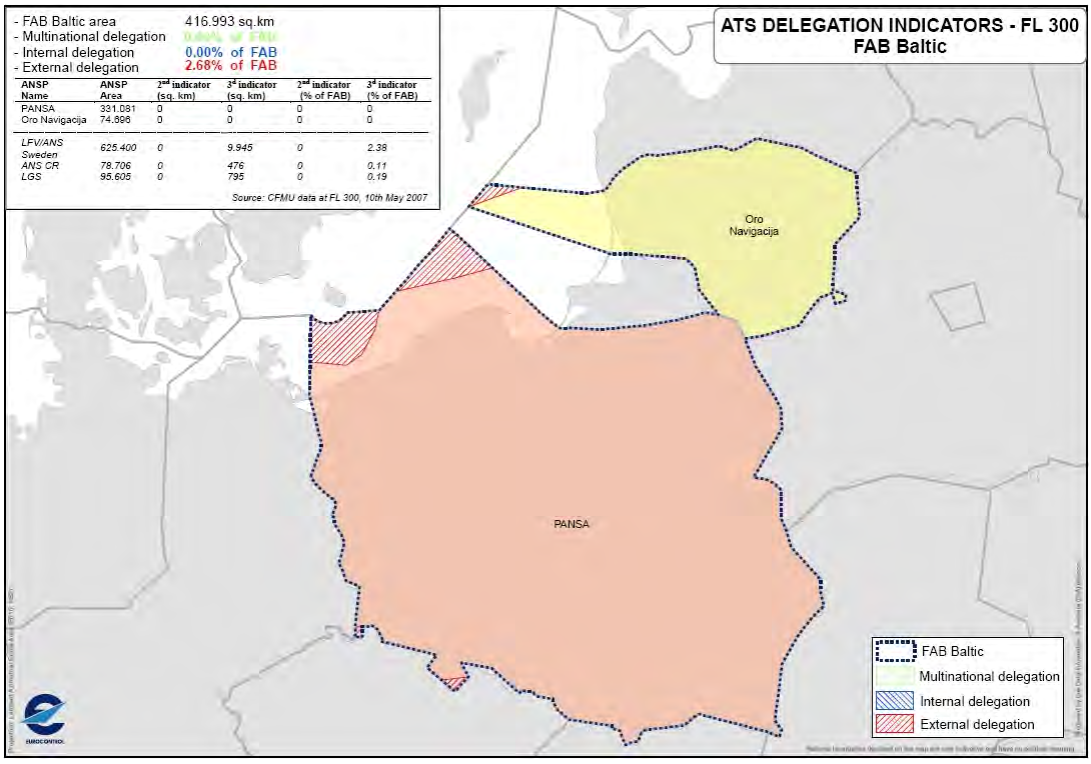
ESARR Implementation

	ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
Due fully by:	**05-11-2007**	**01-01-2002**		**31-03-2008**	**13-07-2003**		**05-04-2004**		**11-04-2005**	
State	**Reg**	**ANSP**	**Reg**	**AST sent**	**ANSP**	**Reg**	**ANSP**	**Reg**	**ANSP**	**Reg**
Lithuania	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Poland	✓	✓	✓	✓	✓	✓	✓	✓	Planned	✓

Source: LCIP 2008-2012 except for Poland following comments received during Draft Final Report consultation

ATS Delegation





Source: EUROCONTROL 2008

GOVERNANCE ARRANGEMENTS

4.3.25 The following working groups (See Figure 4-9) have been involved with the development of the FAB:

Figure 4-9: Key working meetings of the FAB

Organisation	Date of first meeting	Purpose
NAV working group	January 2004	Exchange of information concerning maintenance and repair work of the NAV systems in mutual use between the Baltic states
COM working group	October 2004	Sharing information on international voice and data connections, and developing a common approach to future EUROCONTROL projects
SUR working group	Not known (pre May 2006)	Sharing of surveillance data, experience and professional knowledge between states
Baltic Air Navigation Commission (BANC)	January 2005	Initially, a regional initiative between the three Baltic States and Poland working to create one common FIR in the Baltic Sea. Now between Lithuania and Poland aiming at coordinating national plans for respective CAAs and ANSPs.
BANC Task Force	April 2006	Undertake necessary steps towards the organisation of a FAB in the Baltic are, including a feasibility study

4.3.26 However a governance structure for developing the FAB has not yet been finalised.

AIRSPACE USERS VIEWS[7]

4.3.27 Users have not yet been involved with the development of the Baltic FAB and perceive that no progress has been made.

4.3.28 PRC understands that in the middle of October 2008 Baltic Air Navigation Commission (BANC) decided to launch a process for its communication and consultation policy.

STAFF VIEWS

ATCEUC[8]

4.3.29 ATCEUC and the trade union ZZKRL and the association POLATCA are aware of the Baltic FAB as a project under development at an early stage. However, little information has been provided by the FAB to the trade unions and they are encouraging of more and deeper engagement on the social issues arising.

4.3.30 ATCEUC believe there is very limited chance of co-operation with Kaliningrad or Belarus and as consequence no chance of them joining the Baltic FAB.

7 A summary of IATA views from stakeholder consultation.

8 ATCEUC (Air Traffic Controllers European Unions Coordination) is currently composed of 23 professional and autonomous trade unions representing more than 12000 Air Traffic Controllers throughout Europe. It was created in 1989.

ETF[9]

4.3.31 ETF representatives have not yet been involved in the development of the Baltic FAB.

PRC ASSESSMENT

4.3.32 The Baltic FAB is in the early stages of development. To date limited documentation is available for review and a Feasibility Study has not yet been completed.

4.3.33 The potential of significant benefits emerging from the current Baltic FAB depends on addressing the inclusion of Kaliningrad in the airspace concerned. Without this, it is unlikely that the benefits will justify the costs and time of development and implementation.

4.3.34 In the event that Russia cannot be incorporated into the FAB through Kaliningrad airspace, we believe that these countries should not be forced to create a FAB with the prospects of limited operational benefits. In the event that a solution can be found this might build a model solution for interfaces with non-EU members (along with the experience of Blue Med).

4.3.35 A more important area of airspace for a FAB to address would be the congested areas between Germany and Poland. This is not currently been addressed by any of the FAB initiatives.

4.3.36 The FAB has applied for €2 million of funding to undertake a detailed feasibility study. PRC suggests that the benefits of the FAB need to be demonstrated before undertaking an expensive feasibility study.

4.3.37 The FAB timelines are influenced by the implementation of a new ATM system in Poland in 2010. The lifecycle of that system is 2018 and the timing of the change will need to be influenced by the cost effectiveness of the change as well as the timing of policies for SES II.

9 ETF (European Transport Workers' Federation) is a pan-European trade union organisation which embraces transport trade unions from the European Union, the European Economic Area and Central and Eastern European countries. It was created in 1999. It has affiliated unions which organise workers in railways, road transport, maritime transport, ports and docks, inland navigation, civil aviation, fisheries and tourism services and represents more than 2.5 million workers from 40 European countries. The ETF is the recognised Social Partner in the European Social Dialogue and will represent the interests of transport workers across Europe vis-à-vis the European Commission and the Council of Ministers.

4.4 Blue Med FAB

CONTEXT AND HISTORY

4.4.1 The Blue Med FAB initiative covers the South East Mediterranean airspace, and is being taken forward by four Member States (Italy, Greece, Cyprus and Malta). Tunisia, Egypt and Albania are associate partners and the Kingdom of Jordan has been accepted by the Steering Group as an observer.

4.4.2 ENAV has a leading role within the initiative, although HCAA, Cyprus DCA and Malta ATS are all leading specific work packages and work streams.

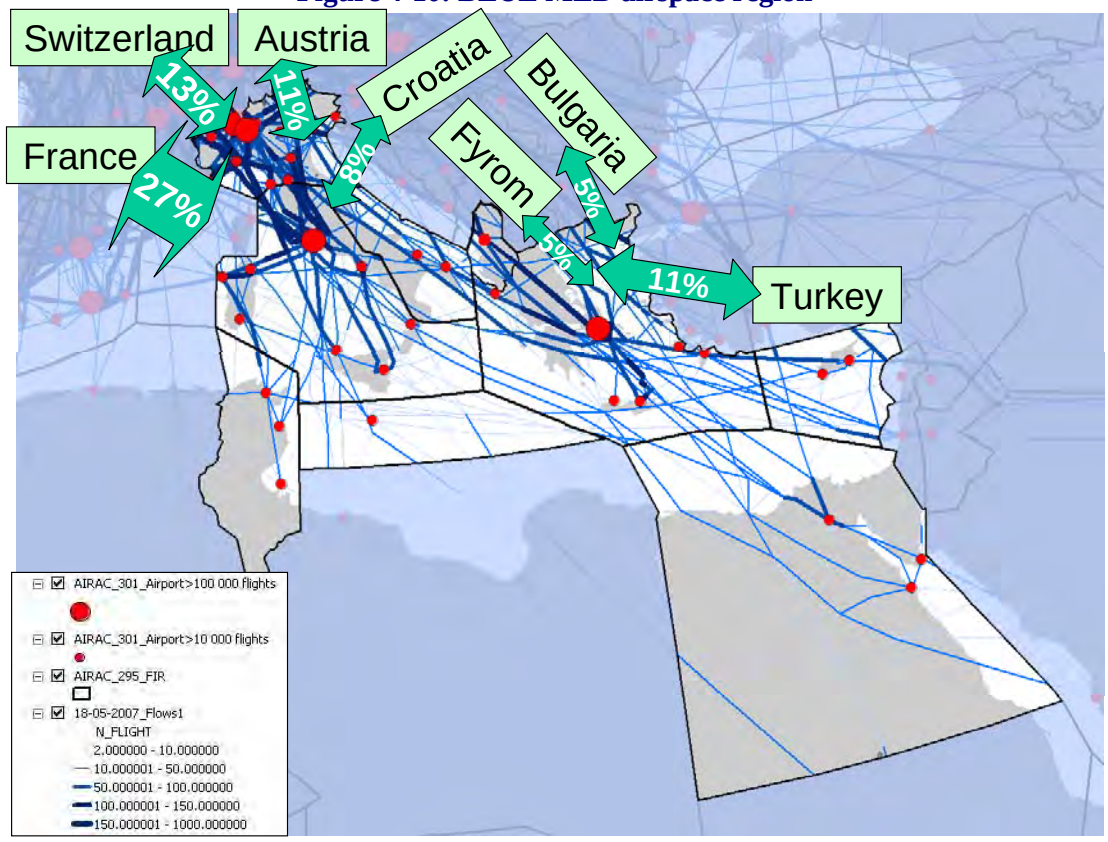
4.4.3 The Feasibility Study was initiated with a TEN-T proposal, submitted by the Italian Ministry of Transport to the European Commission to confirm the participation of all other Member States. The States then mandated their ANSPs to develop the study. The European Commission has been involved with reviewing the outputs of the study and EUROCONTROL provided support under a Special Agreement with ENAV. The study was published in July 2008.

SCOPE: AIRSPACE AND GEOGRAPHY OF THE FAB

4.4.4 The airspace which forms the FAB is shown in Figure 4-10 below[10].

4.4.5 The main traffic flows lie in Italy from the North-West to South-East and particularly from/to France, Switzerland, Austria and Turkey. The airspace covered by the FAB is slightly curved as the route network.

Figure 4-10: BLUE MED airspace region



10 The airspace depicted for Blue Med corresponds to the boundaries of the internationally recognised FIRs of the States and associated partners. The boundaries depicted are only indicative and have no official political meaning.

DEVELOPMENT OF THE FAB

4.4.6 The Feasibility Study addressed detailed airspace design. The study was not limited to the national airspace of the Member States composing the FAB initiative, but also included a wider area in cooperation with other neighbouring Member States and other FABs. The Feasibility Study's main focus was on upper airspace; however some results/recommendations have been produced for lower airspace. The compatibility between upper and lower airspace will be considered in the Definition Phase.

4.4.7 Within the Feasibility Study two scenarios have been developed – the **maximum** FAB scenario and the **minimum** FAB scenario. The two scenarios refer to two possibilities for the scope of the FAB which are considered to be viable by Blue Med members. The minimum scenario is intended to be an intermediate stage before the maximum scenario is implemented in 2015. However, implementing the maximum scenario is not conditional on implementing the minimum scenario.

EXISTING OPERATIONAL CONCEPTS

4.4.8 The following four elements are used to provide a brief description of the existing operational concepts in each of the FAB's ANSPs. For Blue Med, data are only available for the four EC Member States:

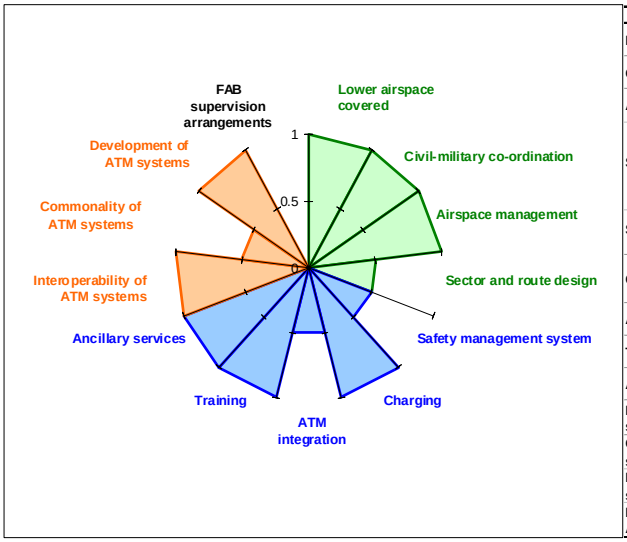
- **En-route civil-military arrangements**: There are significant military activities for Italy and Greece. Each take a slightly different approach with Italy having co-location and integration of the ATC systems but Greece having remote location of civil and military centres, but partially integrated ATC system.
- **Staff management in civil ANSPs**: Italy, and Cyprus have a similar system of individual rostering with the possibility of overtime. Greece has individual rostering with no overtime. Malta has a shift rostering system and overtime as required.
- **Characteristics of pre-tactical ATFCM/ ASM services**: Malta, Greece and Italy have one Airspace Management Cell, Cyprus does not have an AMC. Italy has 4 FMP positions, Greece, Malta and Cyprus each have one FMP position
- **Civil ACC main functions**: Malta and Cyprus each have one ACC that covers En-route, TMA and approach. Italy has four ACCs providing En-route, TMA and approach services; however some approach services are provided by stand-alone units. In Greece, a similar situation arises with one ACC (split into two parts but in the same operational room) covering En-route, TMA and approach, but with some stand-alone approach units.

4.4.9 There are many similarities between the existing operational concepts employed by Italy and Greece. Cyprus and Malta with their smaller organisations are also similar to each other. However, there are some differences between the larger and smaller countries operational concepts in the FAB.

CHANGES PLANNED FOR THE FAB AND ARRANGEMENTS FOR THEIR INTRODUCTION

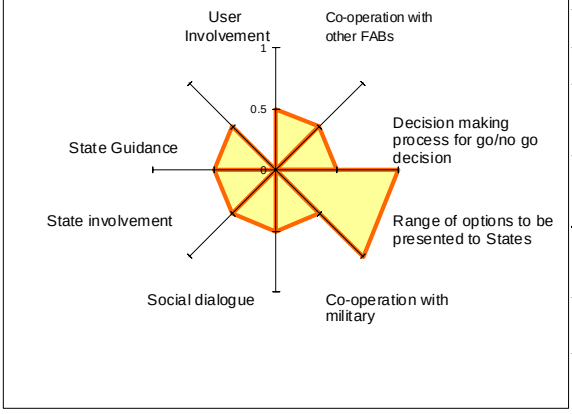
4.4.10 In Figure 4-11 and Figure 4-12 we present two frameworks for the Blue Med FAB. The first describes the key changes planned to be introduced by the FAB, the second describes the arrangement for achieving these changes.

Figure 4-11: Changes planned by the FAB



Characteristic	Justification
Lower airspace covered	Lower airspace is covered to the same extent as upper airspace
Civil-Military coordination	In the maximum scenario the FAB is considering a single civil-military co-ordination cell
Airspace management	Considering a common airspace design team, and introducing a regional ATFCM cell (in max scenario)
Sector and route design	Some optimisation of airspace design planned – emphasis is on upper airspace. Creation of Virtual Centre expected to lead to more direct routings. Clarification required on what exactly is included in the Virtual Centre concept.
Safety Management System	A common and harmonised safety system, with local (national) SMS but co-ordinated at FAB level
Charging	As part of the Feasibility Study the initiative examined the possibility of introducing a single unit rate.
ATM integration	Virtual centre will allow some integration of service provision, but ANSPs are very unlikely to merge
Training	Some rationalisation of approach to training being considered
Ancillary services	Some rationalisation of approach to ancillary services, with potential for joint procurement
Interoperability of ATM systems	Interoperable technologies planned (e.g. ATM 2000+, COFLIGHT project)
Commonality of ATM systems	Cross-national technological initiatives will ensure some commonality of ATM systems
Development of ATM systems	Considering the potential for joint procurement
FAB Supervision Arrangements	Nature of the supervision arrangements have yet to be determined

Figure 4-12: Arrangements for introduction of the FAB



Arrangement	Justification
Co-operation with other FABs	Some discussions with other FABs in Eurocontrol PIM, cross border co-operation with FAB EC and co-ordination with NUAC
Decision making process for go/no go decision	Unanimity single voting per Member State - to be developed further in next stage of work.
Range of options to be presented to States	A minimum and maximum scenario is presented to States in the Feasibility report.
Co-operation with military	FAB has acknowledged that this was initially poor but now underway. Military authorities are going to have an active role in the Governance of the BLUE MED definition phase.
Social dialogue	Some consultation with worker representatives, but limited because project is experimental at this stage. Model for improved dialogue presented at forum in Malta
Involvement of States	The States will lead the Definition Phase of the BLUE MED Project. To date the feasibiltiy study has been led by the ANSPs and consulted with state representatives
Guidance from States to start and support FAB discussions	There is planned to be a ministerial conference in November 2008.
Involvement of users	Users have expressed their dissatisfaction with the level of consultation. Some involvement at stakeholder meeting in Malta in June

TIMESCALES

4.4.11 Key historical and planned dates are:

- November 2007: The results of the Operational analysis were presented in a key deliverable (D1);
- January 2008: The results of the Interoperability analysis (deliverable D2) were available;
- December 2007: The Safety issues results were presented in a key deliverable (D3), alongside with the results of the Legal and Human Resources analysis (deliverable D4);
- April 2008: Results for Charging Schemes were delivered and the relevant part for D4 completed at the end of February;
- July 2008: Blue Med High Level Economic Appraisal was completed;
- July 2008: A final Feasibility Report was released upon completion of the project activities which should occur in mid 2008. The initiative held a high level CAA Director Generals' meeting on the 4th of July, which resulted in a Declaration of Intent from all the CAAs to support the Definition Phase of the Blue Med project. A Ministerial conference took place on the 4th of November 2008 with all the States involved for endorsement of the feasibility results and the start of the Definition Phase.

4.4.12 As a State mandate, the Blue Med FAB is expected to be implemented in 2012. Selection of a preferred option is expected in 2009, and a final decision is expected in 2011.

4.4.13 Blue Med plans for a phased implementation. The first phase of implementation is currently expected to start in 2012-2013, with FAB declaration (2012) and some initial operations. The FAB is planned to reach full operations around 2015.

KEY PRIORITY AREAS FOR THE FAB

4.4.14 As a result of the work done to date (deliverable D1-D4) 16 major FAB Improvement Areas (FIAs) have been identified as the most promising areas in which the establishment of the FAB will potentially generate benefits. These are:

- Operational
  - FIA 01: Common Routes Network design
  - FIA 02: Common Sector Design
  - FIA 03: Common Operational Procedures
  - FIA 04: Airspace consolidation
  - FIA 05: Synergies in ATFCM
- Technical
  - FIA 06: Common R&D
  - FIA 07: Harmonised ATM system
  - FIA 08: Common Procurement
  - FIA 09: Common AIS & MET
  - FIA 10: Surveillance Data sharing
  - FIA 11: Communication Data Sharing
  - FIA 12: Sharing of navigation aids
- Other
  - FIA 13: Improved cooperation with Militaries
  - FIA 14: Common Flight Inspection
  - FIA 15: common Safety Management System
  - FIA 16: Common ATCO Training.

SIZE OF POTENTIAL BENEFITS

4.4.15 As part of the Feasibility Study the initiative conducted a High Level Economic Appraisal (HLEA). The HLEA is not intended to be a formal cost-benefit analysis. A detailed cost-benefit analysis will be conducted as part of the Definition Phase in order to facilitate any final go / no-go decision by the States.

4.4.16 The initiative has made clear that the results of the HLEA are to be considered as indicative. Figure 4-13 summarizes the cumulative monetary value (net benefits) of the improvement forecasted for the Do Minimum and Do Maximum scenarios for the eight KPIs used in the HLEA. These performance improvements relate to a baseline scenario encompassing all expected improvement without a FAB. The baseline scenario includes all improvements expected without the FAB (including those expected from SESAR).

4.4.17 The precise contribution of each initiative to the benefits is currently unclear from the published Feasibility Study, but improvements are forecasts from flight efficiency, training, and systems improvements amongst other things. The "do maximum" scenario represents approximately 8% improvement on the total En-route cost base of Italy, Greece, Cyprus and Malta, while the "do minimum" is a more modest 1.8% by 2020.

Figure 4-13: Financial Summary from Blue Med HLEA (€'s Millions)

Year	Do Max NPV (8% discount rate)	Do Min NPV (8% discount rate)
2010	30.4	5.4
2015	197.5	33.9
2020	362.2	70.5

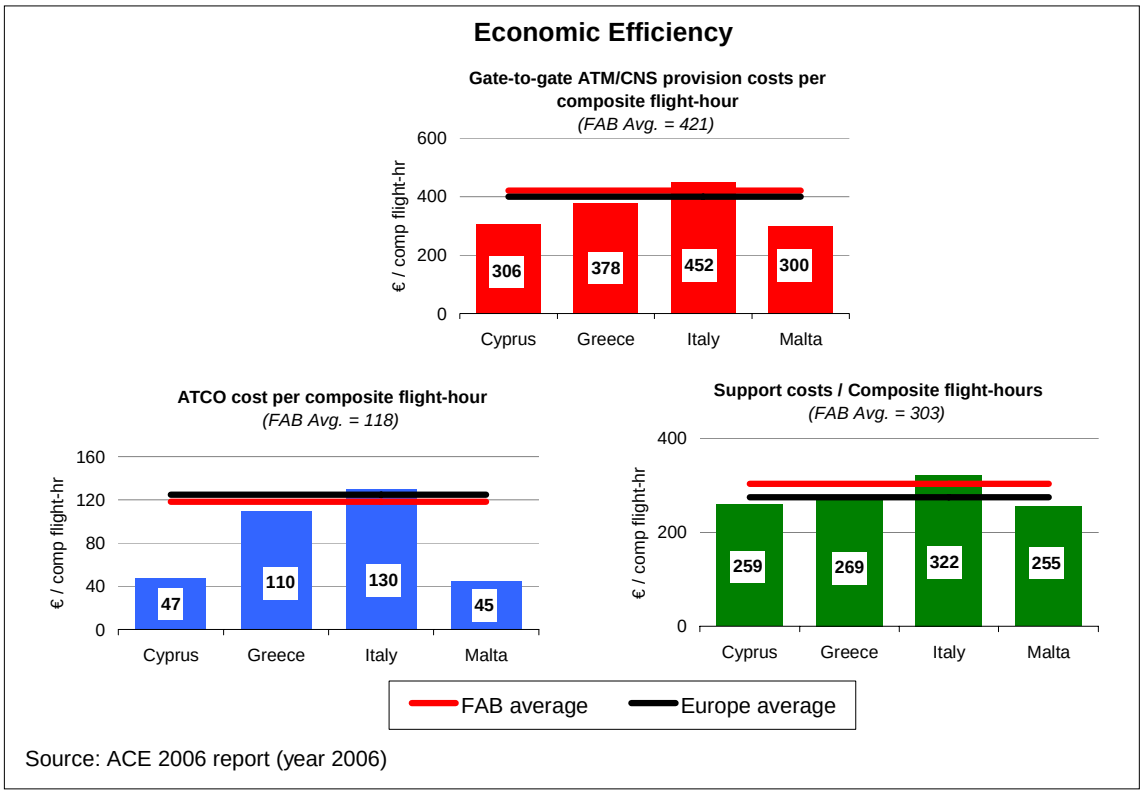
4.4.18 As a proportion of 2006 Total Economic cost (€857M for direct costs + €49Mon for delay costs + €164M for flight efficiency costs), the minimum scenario is projected to produce net benefits of 1.3% in 2013 and 1.6% in 2018. In the Maximum scenario this increases to 4.6% and 6.6% respectively.

KEY PERFORMANCE INDICATORS

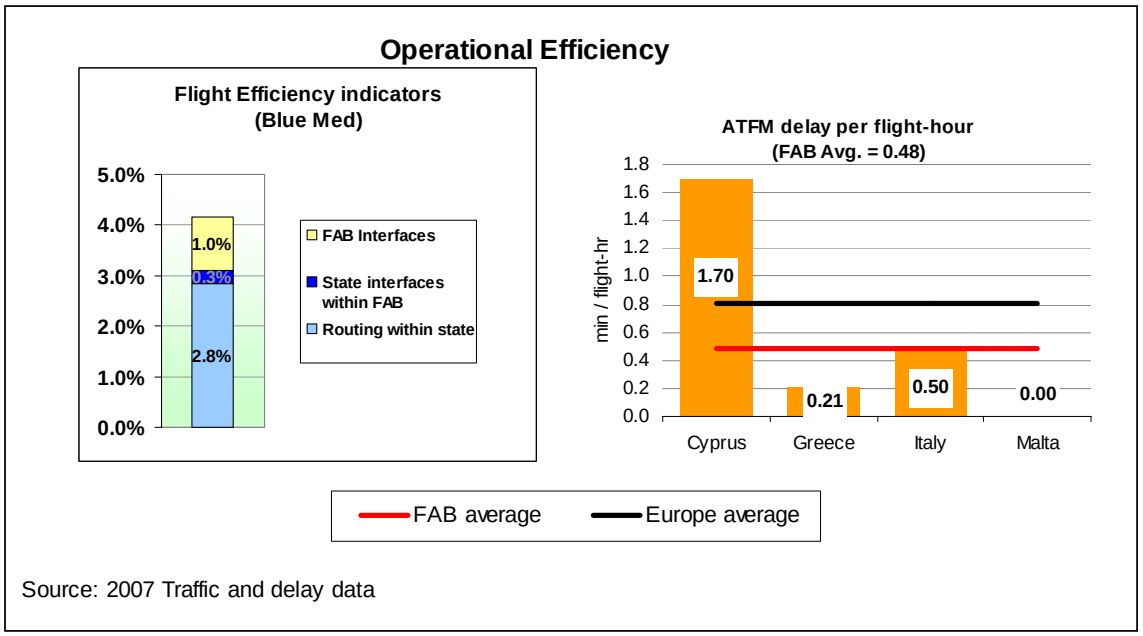
4.4.19 Figure 4-14 shows the main key performance indicators for cost-efficiency, operational efficiency and safety for the Blue Med FAB.

4.4.20 There is particularly high ATFM delay in Cyprus due to limitations in the ATC system capacity.

Figure 4-14: Blue Med Key Performance Indicators



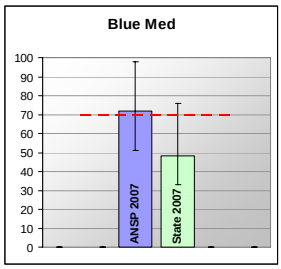
Source: ACE 2006 report (year 2006)



Source: 2007 Traffic and delay data

Safety

Safety Maturity

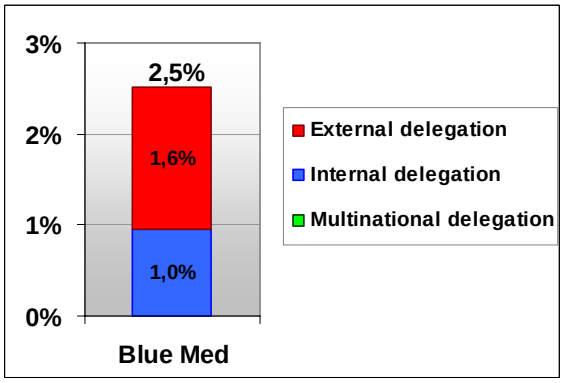


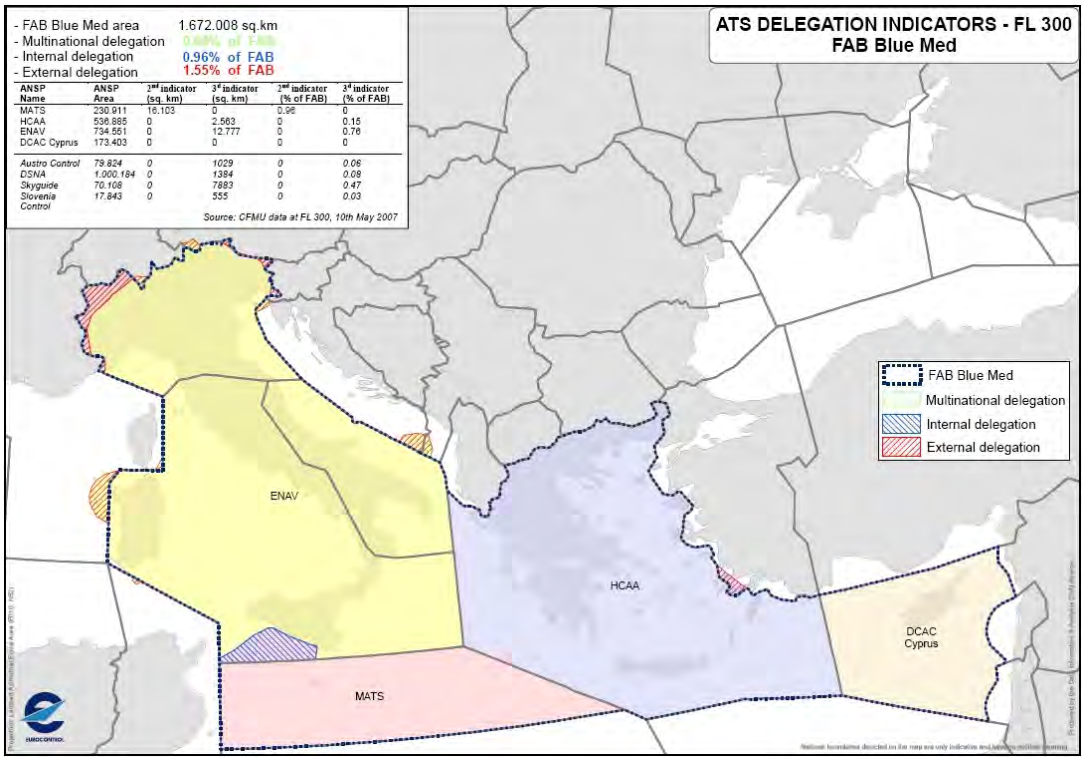
ESARR Implementation

	ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
Due fully by:	05-11-2007	01-01-2002		31-03-2008	13-07-2003		05-04-2004		11-04-2005	
State	Reg	ANSP	Reg	AST sent	ANSP	Reg	ANSP	Reg	ANSP	Reg
Cyprus	✓	✓	✓	No report	✓	✓	Late	Late	✓	✓
Greece	Late	Partial	Partial	No report	Partial	Partial	Partial	Partial	Late	Late
Italy	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Malta	✓	✓	✓	✓	✓	✓	✓	Partial	✓	✓

Source: LCIP 2008-2012 except for Italy following comments received during Draft Final Report consultation

ATS Delegation





This map does not include the three associate partners (Tunisia, Egypt and Albania) Source: EUROCONTROL 2008
Boundaries: see footnote 10.

GOVERNANCE ARRANGEMENTS

4.4.21 The members of the Blue Med initiative have signed a Consortium Agreement which determines all arrangements up until the end of the Feasibility Study.

4.4.22 The mission statement of the Blue Med Feasibility Study is to "identify the feasibility of one or more FABs in the Mediterranean area".

4.4.23 The Project Management Plan gives the following organisational roles for the Feasibility Study:

- A **Steering Group** to take high level decisions affecting the Blue Med Feasibility Study;
- A **Project Team** to guide, monitor and approve the work performed and prepare decisions and recommendations for the Steering Group. The Project Team is chaired by the Project Manager;
- The **Project Manager** is appointed by ENAV and handles the liaison, correspondence and other contact between the Blue Med Feasibility Study and the European Commission, other Projects or Projects and carries out the overall administration of the Project;
- The **Work Package Leaders** are responsible for the progress of the technical work in each Work Package and convene the required meetings;
- The **Task Leaders** were responsible for the progress of the technical work in each Work Item and convene the required meetings;
- Each Partner is responsible for the quality of its own technical work.

4.4.24 The five work packages (WP) are as follows:

- **Management Activity** (WP0); steering and management of the whole project.
- **Operational Analysis** (WP1); analysis of the current Blue Med airspace operational context to allow the identification of problems induced by national boundary constraints and the design of an optimised route network unbound by current constraints. A collection of environmental requirements for the next FAB definition phase will also be performed.
- **Technical Enablers Analysis** (WP2); identification of the minimum set of technical enablers (Surveillance, Networking, ATM tools, Interoperability, etc.) to support the Future Operational Context for the FABs.
- **Safety Assessment Plan** (WP3); identification and definition of all the activities necessary to support the Blue Med safety case development.
- **Financial, Legal and Human Resources Analysis** (WP4); provision of a high level economical appraisal of the implementation of FABs and identification of the legal-institutional and Human Resources issues.
- **Dissemination and Future Plan** (WP5); dissemination of the results of the Feasibility Study to the appropriate stakeholders and planning of the development and implementation phases.

4.4.25 Decisions within the FAB are made by consensus, with one vote per ANSP.

4.4.26 Initially the involvement of the States was at high-level, as the original mandate given to the ANSPs by the States was to demonstrate the feasibility of the

initiative before a more formal role is pursued by the States. Prior to the programme moving into the Definition Phase, the States will become more involved, and the composition of the Steering Group will change to reflect this. The process is expected to be completed by a State Treaty around 2011/12.

4.4.27 The Governance for the definition phase will comprise:

- A Governing body: with State representatives (supported by ANSPs, CAAs and Military Authorities).
- A Programme Management Board (ANSPs, CAAs and Military Authorities).
- An Advisory Group providing users, SESAR, international organisations, and workers' federations.
- A Project Executive team with a project management office and supporting working groups.

4.4.28 Options for organisational arrangements and the decision-making process within the FAB will be provided prior to the end of the Definition Phase (scenario decision).

AIRSPACE USERS VIEWS*[11]*

4.4.29 During the Blue Med feasibility assessment there has been very limited user involvement. This amounted to a brief presentation to IATA and AEA. On this occasion, airspace users were informed about the work undertaken so far but had no opportunity to actively participate in the Blue Med working groups. Since then, there has been more active engagement with airlines and this resulted in a meeting on 26 June in Malta.

4.4.30 Airlines perceive the ambition of Blue Med to be limited, and the reluctance to address centre consolidation a constraint. They perceive this FAB to be largely a continuation of "business as usual" in the sense that airspace design improvements and greater interoperability of systems could be achieved even without a FAB.

STAFF VIEWS

ATCEUC*[12]*

4.4.31 ATCEUC has been involved with the Blue Med project from spring 2008. However, they do not believe that it is acceptable to undertake a feasibility study without more active staff involvement.

4.4.32 Pending a detailed review of the feasibility study, ATCEUC believes that too much focus has been placed on the southern part of the FAB with low traffic volumes. Moreover, they doubt that similar training, technology and professional mentality can be developed across all members of the FAB within the indicated timeframe.

4.4.33 Greek staff have fully participated in social dialogue, as well as Cypriot staff. However, in Malta and Italy there has been more limited involvement.

11 A summary of IATA views from stakeholder consultation.
12 See footnote 8

ETF[13]

4.4.34 At the beginning of the Feasibility Study, only limited staff representation was invited. During April 2008, the first Social Forum was held in Brugge, and was the only example of trade union involvement at a Blue Med FAB level.

4.4.35 At a national level, the staff consider that the information sharing has been very poor (the best situation was in Italy with only one ad-hoc meeting).

4.4.36 More recently, the situation seems to have improved: a stakeholder forum has been held in Malta in June and a 2nd Social Forum in September 2008 has been organised. With regards to the trade unions involvement in the next phase of Blue Med development, staff have received assurance of greater and more regular involvement. Moreover the FAB project management have produced a model for cooperation and is in the process of being approved (July 2008).

PRC ASSESSMENT

4.4.37 This initiative chose to develop the first stage of the FAB initiative with a scoping "feasibility study", and to wait for a first political consent to continue, before developing a more comprehensive study as part of the Definition Phase. It has therefore taken a slightly different approach to some of the other FAB feasibility studies.

4.4.38 There has been significant progress in the Blue Med FAB since the PRC's interim report, with the scoping Feasibility Study and its supporting documents concluded in July 2008. Significant work on the airspace reconfiguration, including fast time simulations, identification of key priority areas and the initial high level quantification of the potential benefits have been completed.

4.4.39 The FAB has been strongly led by ENAV with operational and technical drive combined with a stated willingness to make maximum use of existing infrastructure of all the partners. This is a pragmatic phased project which will take time for significant benefits to materialise.

4.4.40 The FAB has also made progress in widening the geographical scope of the FAB including the airspace of Egypt, Tunisia and Albania, as well as progressing with the integration of the Kingdom of Jordan. This is an opportunity to extend SES standards and requirements beyond EU borders, with clear safety and operational benefits.

4.4.41 The benefits resulting from the "Minimum FAB" are relatively limited, with larger improvements potentially for the "Maximum FAB" scenario. At face value, the magnitude of benefits of the "Minimum FAB" calls into question whether the change is justified. However, this assessment is preliminary and does not include the benefits for non-EC members of the FAB. The FAB expects to implement a mix of the "Minimum FAB" and "Maximum FAB" actions.

4.4.42 Blue Med strongly feels the need to ensure inter FAB cooperation and consistency in order to deliver a genuine performing network. This may prove a challenge with the very different governance and institutional arrangements among partners (HCAA and Cyprus administrations, ENAV is a corporatized entity with commercial focus), and non-EU members with potentially different objectives.

13 See footnote 9

4.4.43 A large amount of work on fast time simulation has been undertaken. However, the airspace design benefits given military implications are not clear yet. Civil/Military co-ordination will be key to achieving the benefits of the FAB.

4.5 Danube FAB

CONTEXT AND HISTORY

4.5.1 The Bulgaria-Romania FAB initiative has been instigated by its Air Navigation Service Providers (ANSPs) – ATSA Bulgaria and ROMATSA in Romania. It was started in 2004, having been created inside the Memorandum of Understanding for ATM cooperation in South-Eastern Europe (ACE) signed in 2003. It was originally envisaged that the programme would also include Turkey and Moldova. The FAB initiative has been presented to the other Parties of the ACE MoU.

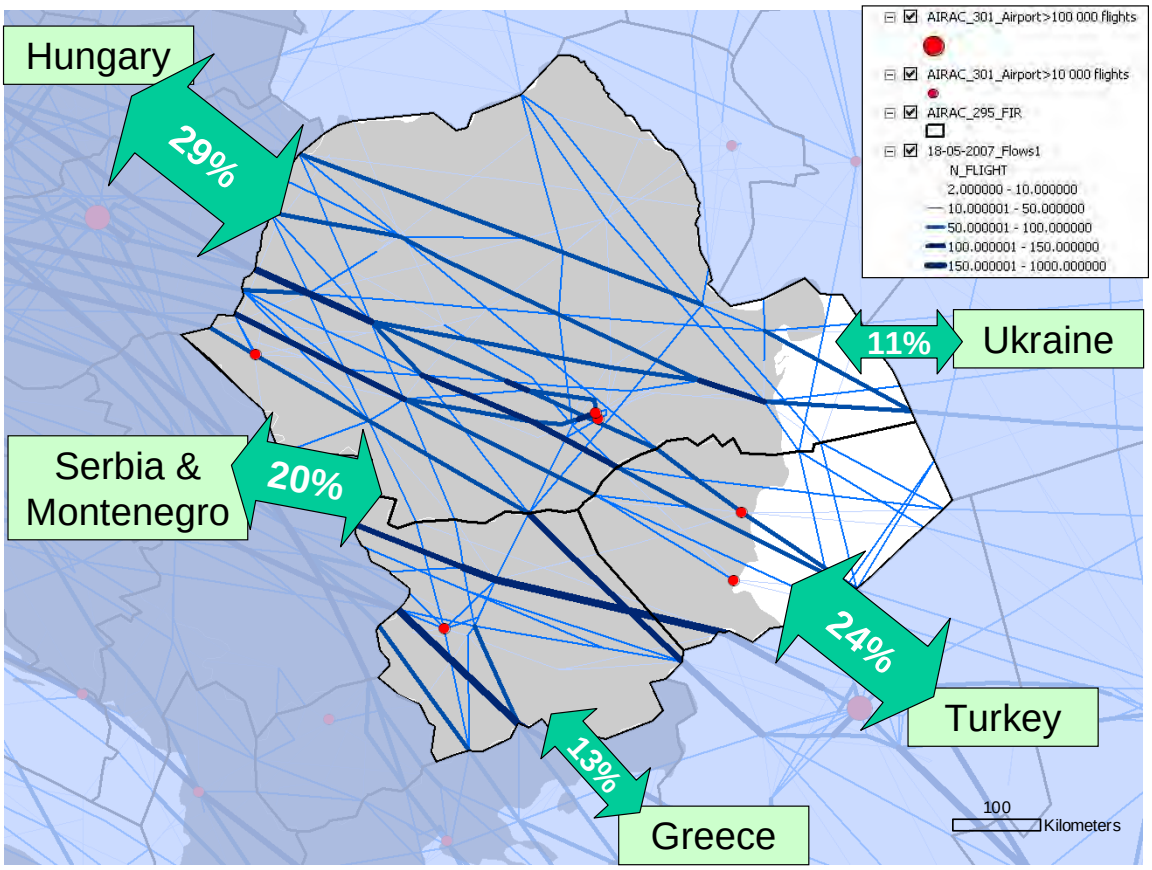
4.5.2 In 2004 the working arrangements and terms of reference for the initiative were established by the two ANSPs. It was at that time named the BULROM FAB, which was renamed the Danube FAB in 2007.

SCOPE: AIRSPACE AND GEOGRAPHY OF THE FAB

4.5.3 The existing organisation of the airspace which forms the FAB is shown in Figure 4-15 below.

4.5.4 The major traffic flow are from North-West to South-East of the FAB, demonstrating that a number of flights use the airspace of both ANSPs.

Figure 4-15: Danube airspace region



DEVELOPMENT OF THE FAB

4.5.5 The FAB programme's approach to airspace design is based on implementing changes towards best operational practice in the Danube FAB, while at the same time meeting the Single European Sky (SES) requirements.

4.5.6 Unlike other FABs, the Feasibility Study prepared for the Danube FAB has been prepared and led by an external consultant rather than the ANSPs themselves. The ANSPs have been actively involved in the preparation of the study.

4.5.7 The Danube FAB's approach was to start with a Feasibility Study contracted by the ANSPs examining in depth all potential benefits and costs from the establishment of the FAB and to achieve a political endorsement in both countries to continue to the preliminary design phase.

4.5.8 To develop a solution to the Feasibility Study, the programme has been analysing the following issues:

- Civil/military cooperation, to maximise Flexible Use of Airspace;
- Segregated areas not influencing the main civil traffic flows will be suggested disregarding national borders;
- Review and harmonisation of present operational procedures;
- Common airspace planning and harmonisation of airspace classification;
- Capacity issues;
- Contingency issues;
- Financial/ economic issues; and
- ATCO licensing and training.

4.5.9 At the initial stage, the Danube FAB programme considered three operational scenarios, described in Figure 4-16.

Figure 4-16: Danube FAB Scenarios

Scenario	Operational arrangements	Company structure
Full integration – "merger scenario"	Two connected ACCs would operate as a "virtual centre", within upper and lower airspace optimised to practicable limits. Aircraft Operators would see the Bulgarian and Romanian airspace as one.	ATSA Bulgaria and ROMATSA are merged into one single Governance structure.
Partial integration – "cooperation scenario"		ATSA Bulgaria and ROMATSA transfer certain functions into a Commonly Owned Entity.
No integration – "alliance scenario"		A bilateral agreement is established governing the co-operation between the two ANSPs, but no common organisation is established and no governance/managerial responsibilities are transferred between the two organisations.

4.5.10 Following discussions in early 2008, ATSA and ROMATSA decided to continue the Feasibility Study focussing on the 'co-operation scenario' involving partial integration. All operational functions would continue to be undertaken by the two ANSPs, but a Common Entity would be established to perform joint activities. These might include planning, co-ordination, development of policies and procedures and external relations. All operational functions would remain with the ATSA/ ROMATSA ATC Centres during initial implementation to 2012. After 2012, there may be additional development of common functions. These

medium term developments include: Flow and Capacity Management, Airspace Management cell, and training of ATCOs. The FAB intends to take an evolutionary approach to developing common functions.

4.5.11 This common function would not have executive powers which would continue to rest with ROMATSA and ATSA. The establishment of a clear Danube FAB governance structure is in the process of being approved in both countries by the end of 2008.

4.5.12 The Final Report which is the main deliverable from the Feasibility Study indicates that a FAB in the airspace of Bulgaria and Romania is a feasible solution, subject to the future work in the Preliminary Design Phase and the Detailed Design and Pre-implementation Phase.

4.5.13 On 18 June 2008, ATSA and ROMATSA applied for TEN-T funding for the development of Phase I / Stage 2 as well as Phases 2 and 3.

EXISTING OPERATIONAL CONCEPTS

4.5.14 The following four elements are used to provide a brief description of the existing operational concepts in each of the FAB's ANSPs:

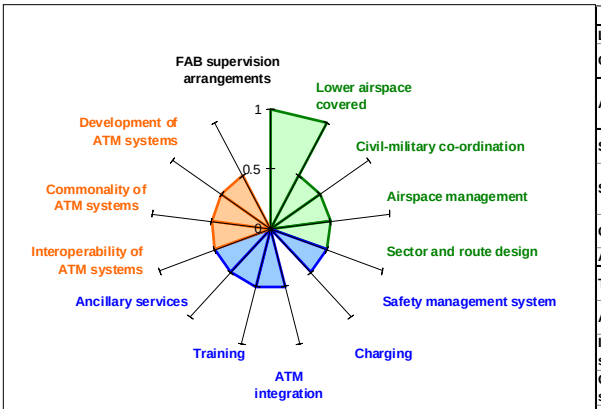
- **En-route civil-military arrangements**: ROMATSA and Bulgaria ATSA both have co-location and integrated ATC civil and military systems.
- **Staff management in civil ANSPs**: both ANSPs have a team based approach to staff management with no potential for overtime.
- **Characteristics of pre-tactical ATFCM/ ASM services**: both ANSPs each have an Airspace Management Cell, Bulgaria ATSA has one FMP, while ROMATSA has 1 FMP.
- **Civil ACC main functions**: Both provide En-route and TMA services from their ACCs (1 in Romania but operated from 3 different locations, 1 in Bulgaria). In both some stand-alone units are used for approach services at airports.

4.5.15 There are many similarities between the existing operational concepts employed by ROMATSA and Bulgaria ATSA.

CHANGES PLANNED FOR THE FAB AND ARRANGEMENTS FOR THEIR INTRODUCTION

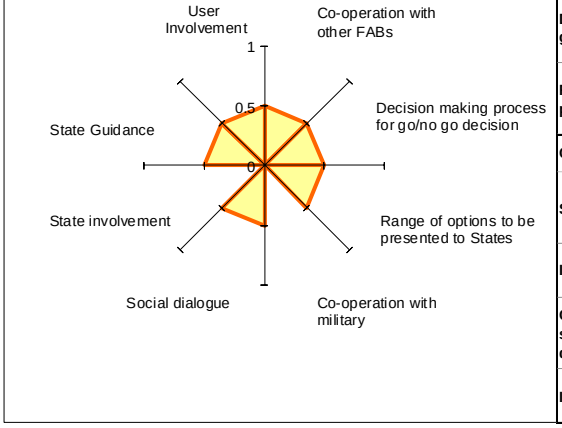
4.5.16 In Figure 4-17 and Figure 4-18 we present two frameworks for the Danube FAB. The first describes the key changes planned to be introduced by the FAB as a result of the 'co-operation scenario', the second describes the arrangement for achieving these changes.

Figure 4-17: Changes planned by the FAB



Characteristic	Justification
Lower airspace covered	Lower airspace included.
Civil-Military coordination	FAB is considering harmonised CIV-MIL coordination procedures, but not a single unit.
Airspace management	A sub-regional NMU function is a possibility in the medium term, but role not clear. It would be a function (co-ordinated service) not a standalone unit.
Sector and route design	Greater co-ordination but not a single unit for route or sector design.
Safety Management System	Safety enhancement through: common safety policy and procedures, however no evidence that a common safety unit is planned
Charging	Feasibility study recommended retaining national unit rates, but with common performance targets
ATM integration	Harmonization of operational procedures considered
Training	Some integrated management and co-ordination of training.
Ancillary services	Feasibility study recommended harmonisation of AIS and MET information and processes
Interoperability of ATM systems	Systems are already largely interoperable but the level of interoperability will be enhanced
Commonality of ATM systems	Harmonized HMI and identical functionality for ATM systems considered
Development of ATM systems	Joint development and procurement of some systems is planned, but in the longer term
FAB Supervision Arrangements	The two NSAs are likely to continue to supervise the FAB, for the foreseeable future.

Figure 4-18: Arrangements for introduction of the FAB



Arrangement	Justification
Co-operation with other FABs	Bulgaria and Romania are both members of the ISIS initiative (formerly SEE FABA) but no evidence of co-operation with other FABs.
Decision making process for go/no go decision	At present certain elements of the decision making process are identified, for instance the two levels of decision, of ANSPs' and States', regular meetings between DGs of the two ANSPs, etc
Range of options to be presented to States	Three organisational scenarios were developed for the initial phase to the same degree of detail but only one of these, the 'Partial Integration' option, has been assessed.
Co-operation with military	Some involvement in meetings and stakeholder consultation but limited to date.
Social dialogue	Social dialogue is seen as a critical factor for success and a dedicated WG is set up. However, staff representatives believe that social dialogue has been limited.
Involvement of States	Initiative has to date been led by the ANSP's consultants. There is no evidence of active involvement by the States.
Guidance from States to start and support FAB discussions	A joint statement of endorsement in 2005 and common vision for co-operation in 2006. State involvement more recently has involved endorsement of the feasibility study
Involvement of users	Consultation meetings with the users have been organised but no evidence that the design of the initiative has reflected users' concerns.

TIMESCALES

4.5.17 We understand the timescale for the Danube FAB initiative to be:

- Proposal and Inception: October 2004;
- Pre-feasibility phase: February 2005-mid 2007;
- Feasibility assessment – Stage 1: December 2007;
- ANSPs decision regarding the preferred solution: January 2008;
- Feasibility assessment – Stage 2: January-July 2008;
- Decision by States to whether to proceed to preliminary design phase (detailed feasibility assessment): End 2008;
- Preliminary design phase (detailed feasibility assessment): 2009-10;
- Detailed design and pre-implementation phase: 2011-12;
- FAB implementation and operations started (step by step): 2013+

KEY PRIORITY AREAS FOR THE FAB

4.5.18 The FAB initiative has identified a number of sources of potential performance improvements resulting from the introduction of the FAB. We have grouped these according to the PRC criteria of cost-efficiency, operational and safety improvements expected from FAB initiatives:

- **Cost-efficiency**
  - Common planning and use of human and technical resources;
  - Increased flexibility handling the traffic in the tactical phase;
  - Less administrative overheads;
  - Joint ATM/CNS development; and
  - Coordinated and rationalized maintenance and procurement.
- **Operational efficiency**
  - Further airspace structure optimization by eliminating border constraints;
  - Capacity increase by reducing and harmonizing the separation minima and by optimizing flight profiles; and
  - Common airspace management.
  - Common operational procedures;
  - Common training and licensing procedures;
  - Shared contingency resources (Sofia/Bucharest centres)
  - Improved civil-military coordination:
    - enhanced FUA;
    - common Border Area/Operations; and
    - Pan-European OAT-IFR routes.
- **Safety**
  - Common safety policy and procedures.

SIZE OF POTENTIAL BENEFITS

4.5.19 The FAB programme delivered its Final Report for the Feasibility Study in September 2008.

4.5.20 In the Final Report, the FAB initiative presents indicative cost and benefit figures, which are shown in Figure 4-19 below. Some of the assumptions on which these are based are not clear (for example, for traffic growth or the discount rate). External benefits are assumed to arise from improvements to flight efficiency, which lowers operational costs for airlines, delivers time savings to passengers and reduces emissions. Figures are provided for two scenarios for reduction in route extension, although it is not clear how the FAB initiative considers that these reductions can be achieved.

Figure 4-19: Financial and Economic Benefits of Danube FAB scenarios

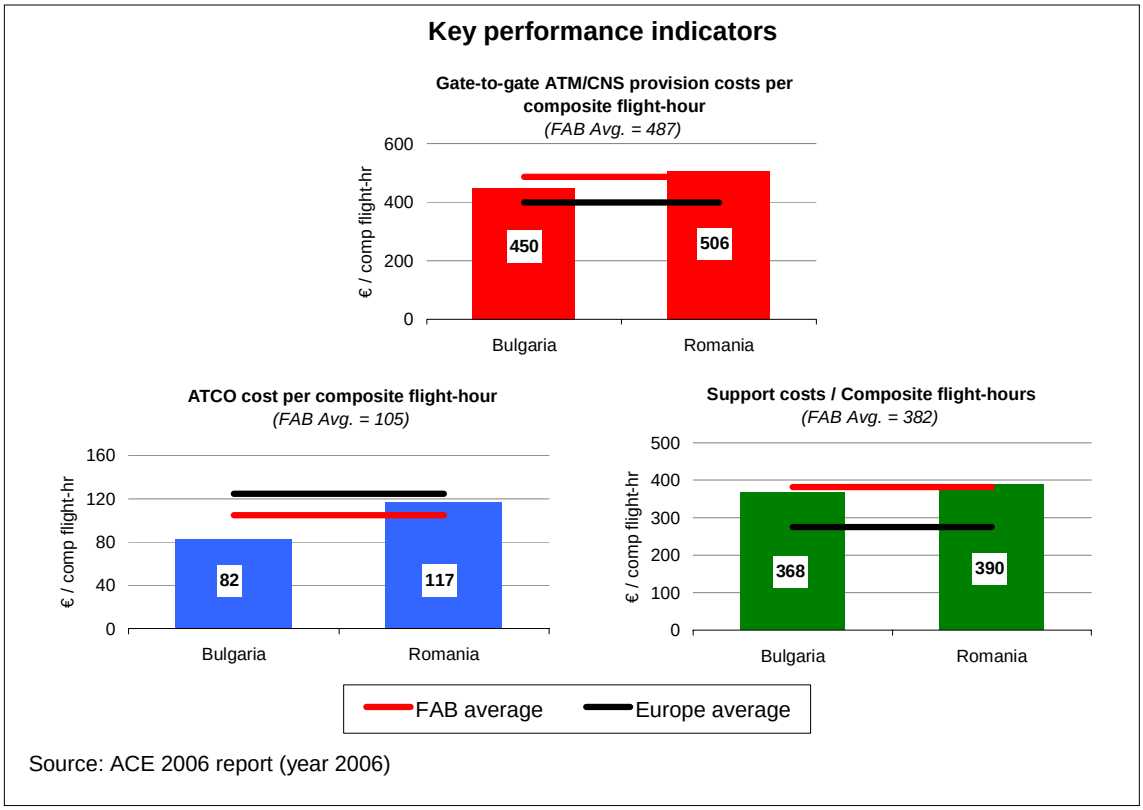
Scenario	Scenario 1 – 1.8% reduction in flight distance and time Costs / benefits € millions	Scenario 2 – 1.0% reduction in flight distance and time Costs / benefits € millions
Financial effects:		
Investment 2009-12	9.6	9.6
Annual net savings after 2012	0.6	0.6
External benefits		
With present fuel prices:		
Airline savings	46.2	25.7
Passenger time savings	15.3	8.5
Environmental benefits	4.9	2.7
Total external effects per year	66.4	36.9
NPV of external effects 2011-20	439.5	224.1
With 50% higher fuel prices:		
Total external effects per year	82.4	45.9
NPV of external effects 2011-20	553.1	307.3

KEY PERFORMANCE INDICATORS

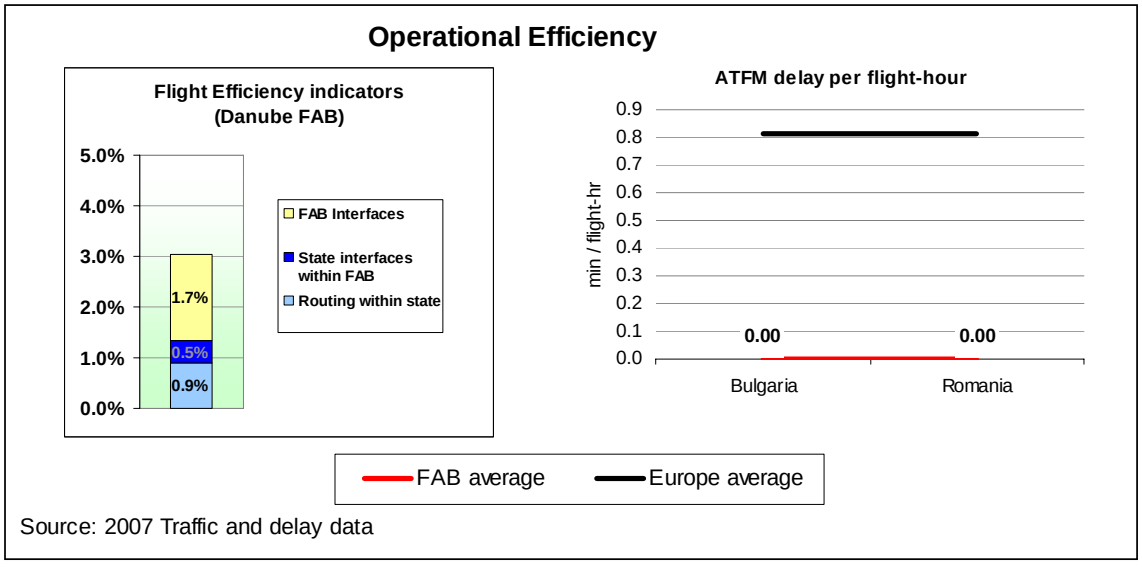
4.5.21 Figure 4-20 shows the main key performance indicators for cost-efficiency, operational efficiency and safety for the Danube FAB.

4.5.22 Both ANSPs in the FAB have relatively high support costs but experience no ATFM delay. There is currently no ATS delegation in the FAB and a large amount of the horizontal flight extension cannot be addressed within the FAB, as the majority relates to inter-FAB interfaces.

Figure 4-20: Danube Key Performance Indicators



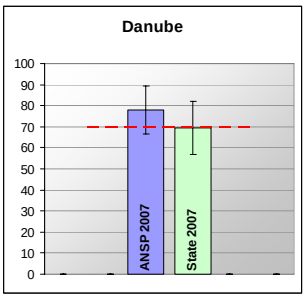
Source: ACE 2006 report (year 2006)



Source: 2007 Traffic and delay data

Safety

Safety Maturity

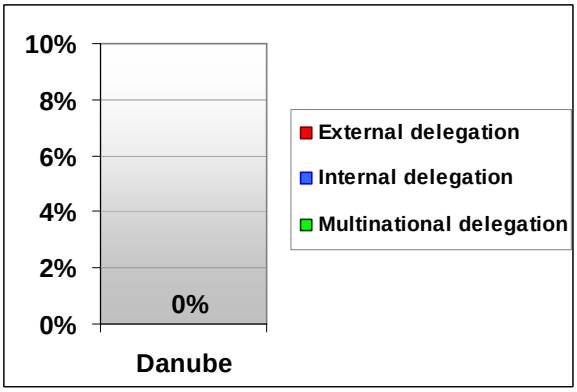


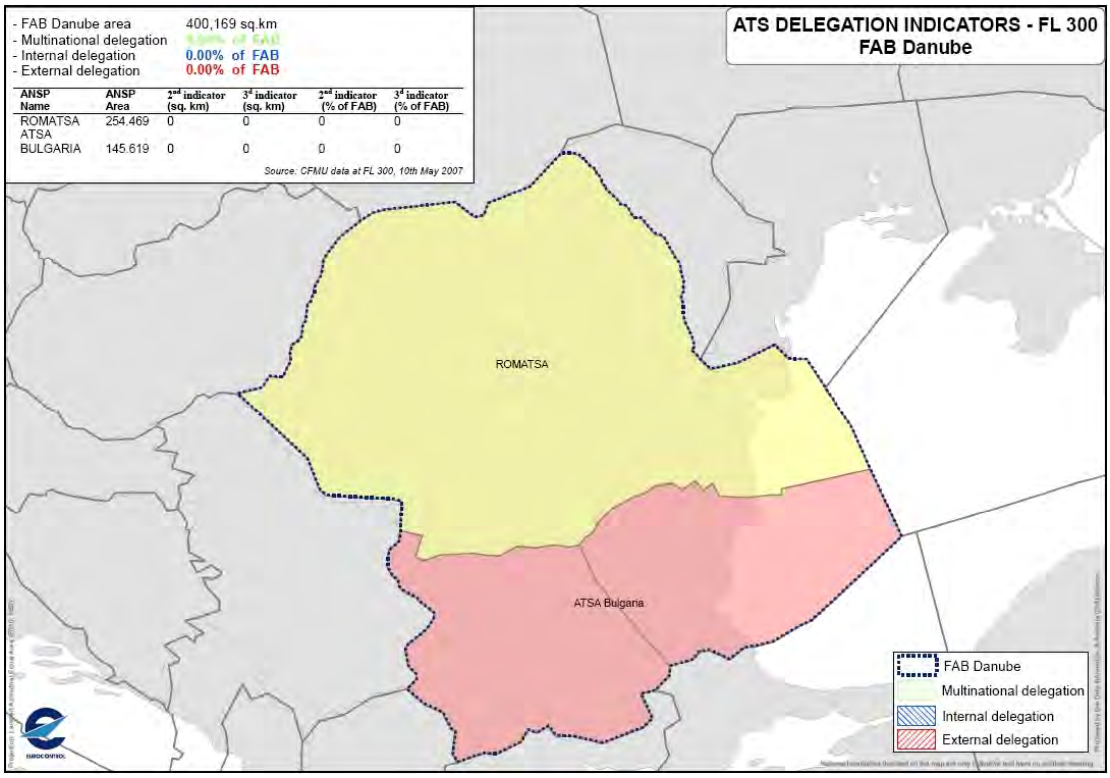
ESARR Implementation

	ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
Due fully by:	05-11-2007	01-01-2002		31-03-2008	13-07-2003		05-04-2004		11-04-2005	
State	Reg	ANSP	Reg	AST sent	ANSP	Reg	ANSP	Reg	ANSP	Reg
Bulgaria	Partial	✓	Partial	No report	✓	Late	✓	under rev	✓	Partial
Romania	Planned	✓	✓	✓	✓	✓	✓	✓	✓	✓

Source: LCIP 2008-2012

ATS Delegation





Source: EUROCONTROL 2008

GOVERNANCE ARRANGEMENTS

4.5.23 Since February 2005, a joint Romanian-Bulgarian FAB WG has overseen the development of the FAB. However the majority of the work on the Feasibility Study (Stage 1 & 2) has been undertaken by consultants reporting to this WG.

4.5.24 We understand that the NSAs and DGCAs have been involved with this working group.

AIRSPACE USERS VIEWS[14]

4.5.25 Users' involvement in the Danube FAB has been confined to the open stakeholder meetings. Moreover, they perceive that the Feasibility Study has been consultant-led with limited commitment from both the ANSPs and Member States. Indeed they consider that the Member States appear sceptical of the benefits of the FAB. Moreover, some of the co-operation involving operational harmonisation presented as key benefits from the Danube FAB initiative could take place outside of a FAB.

4.5.26 The CAAs and Military do not appear to be engaged in the process.

4.5.27 According to FAB management two open stakeholder meetings took place in each of Sofia and Bucharest in 2007 and 2008 and the deeper involvement of users is expected during the next stage of FAB development.

STAFF VIEWS

ATCEUC[15]

4.5.28 The CAAs and NSAs did attend and actively participate in the open stakeholder meetings.

4.5.29 Upon request, a bilateral meeting was organised between the FAB and staff representatives. Because of tight timescales, it was difficult to obtain information and a full social dialogue was difficult to undertake.

4.5.30 ATCEUC consider that the experts from the ANSPs have been actively involved with the process and therefore there is no real risk of lack of ownership from the ANSPs.

ETF[16]

4.5.31 After a good start at the pre-Feasibility Study stage, there is a perception that staff involvement during 2007 was very limited before the stakeholders meeting in December 2007. In 2008 there was no social dialogue. Even after this, the trade unions consider that it has been difficult to obtain information. Information has only been provided upon request to trade unions and they do not feel integrated or effectively involved in the Feasibility Study process.

PRC ASSESSMENT

4.5.32 The Danube FAB Feasibility Study has progressed throughout the duration of this study. We have been advised by Danube FAB that ANSPs, NSAs and Member States have been actively involved in the Final Feasibility Study Report, which they fully support.

14 A summary of IATA views from stakeholder consultation.
15 See footnote 8
16 See footnote 9

4.5.33 However, this feasibility study is based on a number of assumptions and experts' judgements, which would need to be tested and validated (e.g. through simulations). Moreover, there is limited presentation of quick win opportunities. Therefore, the timing and magnitude of benefits are uncertain at this stage.

4.5.34 To date, performance objectives have not yet been articulated by the ANSPs or Member States. As there are no ATFM delays, the focus on the improvement would need to be on flight efficiency and support functions.

4.5.35 Currently there is no ATS delegation in the FAB, although a potential hurdle to this has been addressed through modification of the aviation laws in Bulgaria and Romania. However, it is not yet clear what airspace reconfiguration or re-organisation will take place, or the extent of ATS delegation over cross-border areas.

4.5.36 However, the creation of a FAB should be facilitated by the fact that both ANSPs have similar operational concepts and modern ATM systems.

4.5.37 In summary, the PRC believes that significant progress still needs to be made before a clear operational plan and CBA are finalised for the FAB, setting out a solid basis for development and implementation.

4.6 FAB Central Europe (FAB CE)

CONTEXT AND HISTORY

4.6.1 The FAB CE initiative is the successor to the CEATS project and it was instigated by seven States and their Air Navigation Service Providers (ANSPs):

– ANS CR (Czech Republic)	– HungaroControl (Hungary)
– Austro Control (Austria)	– Letové Prevádzkové Služby (LPS) (Slovakia)
– Croatia Control (Croatia)	– Slovenia Control (Slovenia)
	– BHDCA (Bosnia-Herzegovina).

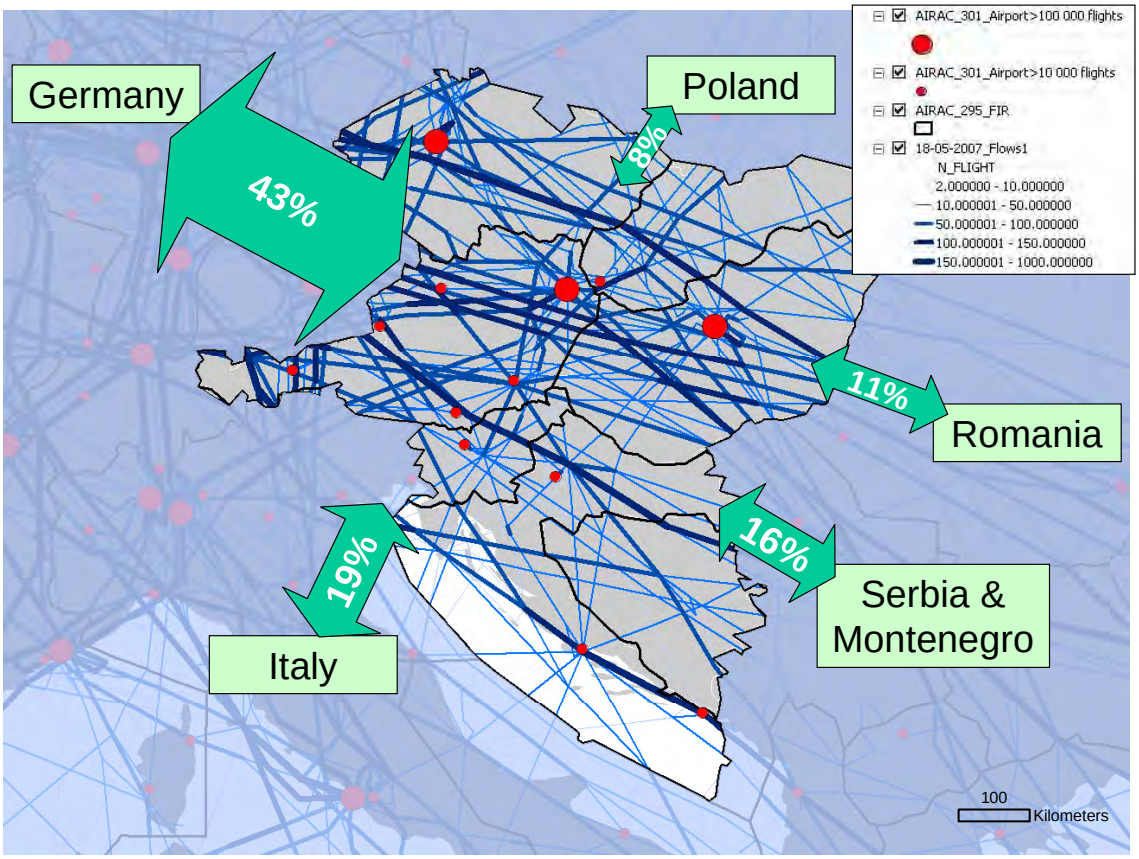
4.6.2 The project manager and facilitator of the Feasibility Study was EUROCONTROL, as confirmed by the meeting of the CEATS Coordination Group of 8 November 2006. In the next stage of the project EUROCONTROL will continue to support FAB CE on the basis of a Special Agreement.

SCOPE: AIRSPACE AND GEOGRAPHY OF THE FAB

4.6.3 The existing organisation of the airspace which forms the FAB is shown in Figure 4-21 below.

4.6.4 The main traffic flows East-West, often crossing multiple ANSPs to the northern part of the airspace area.

Figure 4-21: FAB Central Europe airspace region



DEVELOPMENT OF THE FAB

4.6.5 Prior to the instigation of FAB CE, the purpose of CEATS (Multilateral Agreement between 8 Member States and EUROCONTROL signed in 1997) was the development of a consolidated facility for ATS provision to be located in Vienna. As of 8 November 2006, this was replaced by the goal of full use of existing and planned infrastructure with responsibilities for service provision entrusted to national ANSPs. Italy indicated its intention to pursue the Blue Med FAB and to discontinue its support to the CEATS.

4.6.6 The FAB CE would concentrate on effective utilization of existing infrastructure. Services would be provided by ANSPs in the FAB CE region and the project would be implemented as a FAB including both upper and lower airspace. These principles have been established through a "Common Understanding" statement between ANSPs leading to the initiation of the Feasibility Study, which was published and approved in March 2008.

4.6.7 On 30th May 2008, the seven ANSPs signed a Memorandum of Cooperation as part of the process for developing an Implementation plan. This has been followed by a Declaration between seven Member States (June 2008). A MoU between States is under development and is expected to be signed by the end of 2008.

EXISTING OPERATIONAL CONCEPTS

4.6.8 The following four elements are used to provide a brief description of the existing operational concepts in each of the FAB's ANSPs:

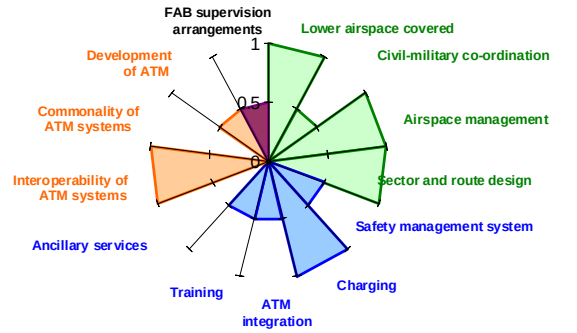
- **En-route civil-military arrangements**: Austro Control provides ATC services to GAT. There are no OAT flights outside military zones in Austria. Both Croatia control and HungaroControl provide ATC services to GAT and OAT. For ANS CR, there is a remote location of civil and military centres, but partially integrated ATC system.
- **Staff management in civil ANSPs**: There is a range of staff management arrangement in the ANSPs of FAB CE: Slovenia Control and LPS have team rostering with no overtime, Croatia control and HungaroControl have team and no overtime, while Austro Control and ANS CR have individual rostering with overtime.
- **Characteristics of pre-tactical ATFCM/ ASM services**: Each of ANS CR, HungaroControl, Slovenia Control and LPS have one Airspace Management Cell and 1 FMP. Austro Control and Croatia control have 1 FMP.
- **Civil ACC main functions**: In each of the States, one ACC provides en-route and TMA services. Approach control services are provided by stand-alone units in four of the ANSPs but by the main ACC in the other two.

4.6.9 Due to the number of ANSPs in the FAB, there are significant differences in operational concepts across the FAB. This may be a source of difficulty when creating the FAB a working group has been established by the FAB to address these issues.

CHANGES PLANNED FOR THE FAB AND ARRANGEMENTS FOR THEIR INTRODUCTION

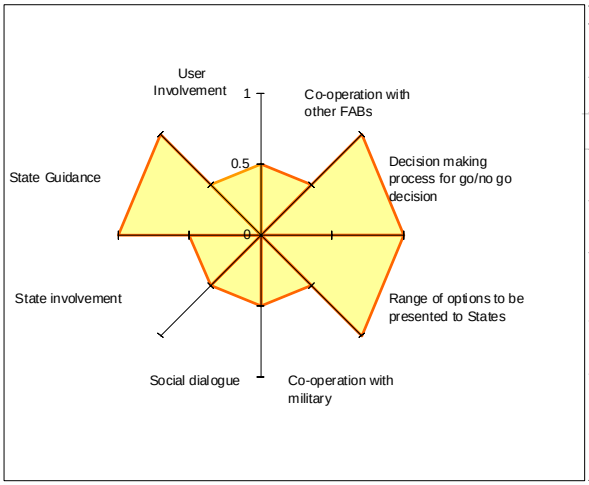
4.6.10 In Figure 4-22 and Figure 4-23, we present two frameworks for FAB CE. The first describes the key changes planned to be introduced by the FAB, the second describes the arrangement for achieving these changes.

Figure 4-22: Changes planned by the FAB



Characteristic	Justification
Lower airspace covered	The FAB will cover lower airspace, but not TMA or Approach
Civil-Military coordination	The FAB will establish a Joint Civil-Military Coordination Body responsible for co-ordinating airspace design
Airspace management	The FAB evaluated an option for a single Airspace Management Cell, or AMC/FMP for the whole of FAB CE airspace.
Sector and route design	Extensive cooperation of the FAB ANSPs and military providers, through JCAMB in airspace and route design and coordinated ATFCM/AS, resulting in a comprehensive re-sectorisation of the airspace.
Safety Management System	Common procedures and principles would be introduced but there is no intention to introduce a common safety unit
Charging	It is within the scope of the feasibility study to discuss all options, including a single unit rate.
ATM integration	Some of the options consider some service provision integration.
Training	In scope, looking at shared use of training facilities and staff, but unlikely to result in a single training centre in the short term
Ancillary services	The feasibility study considered common AIS/MET interface to ATM but no integration
Interoperability of ATM systems	Examining an interoperable FDP and HMI is in scope
Commonality of ATM systems	There is no evidence that enhanced commonality of systems will result from the implementation of the FAB
Development of ATM systems	A common system across the FAB is not in scope; however, specifications or developments are investigated for particular areas (ASM/ATFCM, datalink, etc.)
FAB Supervision Arrangements	The FAB will establish a NSA coordination committee

Figure 4-23: Arrangements for introduction of the FAB



Arrangement	Justification
Co-operation with other FABs	No formal arrangements taking place, but are being facilitated through Eurocontrol. Italy observer, link into Blue Med developments
Decision making process for go/no go decision	Clear responsibilities for governance (CCG) and timetable for decision-making
Range of options to be presented to States	Range of scenarios presented in the Feasibility Study to CCG (static and dynamic scenarios)
Co-operation with military	Military representatives are involved with two working groups. However, military representatives are not directly involved in the FAB steering group
Social dialogue	Process was initiated during the Feasibility Study and is planned to continue in a more structured way during the preparation phase.
Involvement of States	The States are represented in the decision making body through the CCG. However, need evidence that States objectives/concerns have been taken into account
Guidance from States to start and support FAB discussions	The Minister of Transport of the participating States have signed a Declaration of Intent
Involvement of users	IATA is a member of the FAB Steering Group. Austrian airlines is on two working groups. In PRC's meetings with airlines they claim that their advice has not been taken on board in the feasibility study. The inputs provided by IATA are planned to be used to refine the CBA in the next phase

TIMESCALES

4.6.11 Between March 2007 and March 2008, the FAB CE has developed three key documents: A Master Plan, a Feasibility Study/CBA and a Safety Assessment. Within the Master Plan the initiative provides detail of the planned timescales for FAB CE implementation. The initiative has put forward a potentially three phased implementation strategy:

- An **Initial Scenario** – involving interim ANSP and State level cooperation arrangements which would be progressively implemented. This would initiate closer cooperation in all domains, especially Operations, Human resources, and Technical. The initial scenario is focussed on satisfying the requirements of the SES regulations and on establishing the legal and institutional framework for the FAB.
- A **Static Area of Responsibility** (AoR) **Scenario** – consisting of regional cooperation in the provision of ATS, centralised planning and functional integration of ASM and ATFCM measures with extensive cross-border sectors.
- A **Dynamic AoR Scenario** – optimisation of the use of technical and human resources using dynamic changes in the AoR.

4.6.12 The Master Plan states that these would be treated as separate projects, each with its own timescale of delivery. These are as follows:

- Proposal and Inception: March 2007 (all scenarios);
- Feasibility Study: March 2008 (all scenarios);
- Declaration by States to proceed in principle in the third Quarter of 2008 (all scenarios);
- Preparation for implementation/ Development phase:
  - **Initial Scenario** - 2008-2009 (this includes the Definition and Development phases stated in the Master Plan);
  - **Static AoR Scenario -** 2008-2010 (this includes the Definition and Development phases stated in the Master Plan);
  - **Dynamic AoR Scenario -** 2008-2015 (this includes the Definition and Development phases stated in the Master Plan
- Signature of FAB agreement and establishment of governing structures, including the ANSPs co-operation: 2009
- Entry into force of the FAB agreement and start of operations: 2012
- Implementation:
  - **Initial Scenario** - no Deployment phase is stated in the Master Plan;
  - **Static AoR Scenario -** 2010-2012 (this is the Deployment phase stated in the Master Plan);
  - **Dynamic AoR Scenario -** 2015-2017 (Deployment phase is stated to be 2015+; we assume 2 years for implementation).
- Operations gradually started:
  - **Initial Scenario** - 2010+;
  - **Static AoR Scenario -** 2012+;
  - **Dynamic AoR Scenario** - 2017+.

KEY PRIORITY AREAS FOR THE FAB

4.6.13 Figure 4-24 below details the performance targets that the initiative identified in the Feasibility Study.

Figure 4-24: FAB CE Performance targets/objectives

Area	Target
Capacity	Increase capacity to cope with the increase of around 140% in traffic in 2025 (increase of 60% in 2017) with a maximum delay of 0.6 minutes per flight (0.3 in 2017) and satisfying the military needs.
Safety	The implementation of FAB CE will maintain and wherever possible improve the current level of safety notwithstanding the increased traffic through the establishment of a common Safety Management System.
Cost-effectiveness	Improve en-route financial cost-effectiveness by 5% in 2017 and by 10% in 2025 compared with 2006, despite convergence in salaries between Central European economies and Western Europe. Decrease in ATM induced cost for Military operations.
Flight-efficiency	Save 2 million km annually by 2017 onwards.
Environment	Save 22 thousand tons of CO_2 annually by 2017 onwards.
Mission effectiveness	Avoid cancellation of mission due to ATFCM.

Source: Master Plan summary

GOVERNANCE ARRANGEMENTS

4.6.14 The proposed institutional framework of the initiative in the Development Phase is shown in Figure 4-25 below. The ANSPs and Member States have agreed a clear governance structure of the next stage of the project. However, to date this has not been implemented and the CEATS Co-ordination Group (CCG) is continuing to be used as the forum of decision making.

4.6.15 The highest level of governance for the FAB will be the FAB CE Council of which the Joint Civil-Military Airspace Coordination Body (JCMACB) will form an integral part. The Ministers of Transport (or their representative) of all participating States will have voting rights on the FAB CE Council. ANSPs will also have representation on the FAB CE council, but will not have voting rights. The FAB CE Council will be responsible for:

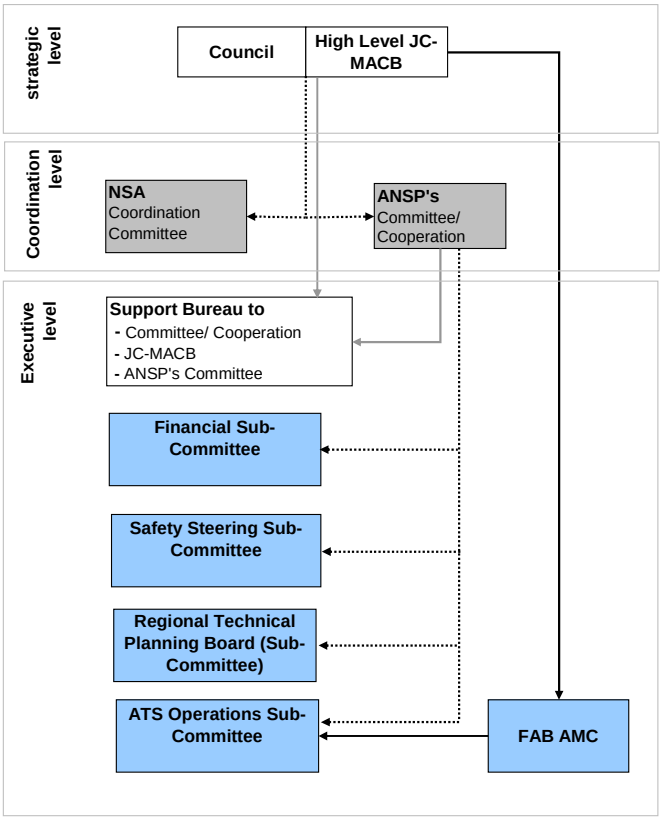
- Formulation and endorsement of the development and strategy for internal and external matters of FABs;
- Communication with the NSA Coordination committee;
- Modification of the FAB;
- Applicable rules and procedures within the FAB;
- Amendments to Annexes of the FAB Agreement; and
- Supervision and monitoring of implementation by the Committee of the tasks assigned by the Council.

4.6.16 The JCMACB will be a defined part of the FAB CE Council. The JCMACB will be, at the strategic level, responsible for:

- Airspace design;

- Airspace management and ATFCM;
- Setting KPI performance targets for the ATM system, performance assessment; and
- Operations planning (with participation of the CFMU) and facilitation.

Figure 4-25: Institutional set-up for the Development Phase



4.6.17 The FAB CE Council and JCMACB will be supported by a permanent support bureau.

4.6.18 The NSA Coordination Committee will be charge with coordinating the national NSAs (for further discussion of this see the supervisory and regulatory arrangements section below).

4.6.19 The ANSP Committee/Cooperation will be responsible for harmonisation, coordination and cooperation among ANSPs and for the creation and dissolution of its sub-committees. The CEOs of the ANSPs in the participating States will form the top management board of the ANSP Cooperation and will therefore act as the ANSP committees.

4.6.20 There will be number of sub-committees to the ANSP Committee, these will include:

- **ATS Operations Sub-Committee** – responsible for operational matters and sectorisation, and proposals for operational design.
- **Regional Technical Planning Board** – responsible for tasks related to integration and/or common procurement of technical infrastructure, synchronisation of the use of technology and equipment, and technical planning for mandatory implementation.

- **Financial Sub-Committee** – responsible for tasks related to financial coordination, assessment of financial impact of proposals by other sub-committees, issues of single unit rate, VAT on route charges, financial incentives, and common cost control.
- **Safety Steering Sub-Committee** – responsible for tasks related to the harmonisation of safety management systems according to the define levels of harmonisation. In particular it will be responsible for adjusting measurement methodology and establishing a reporting scheme.

SIZE OF POTENTIAL BENEFITS

4.6.21 To support the Feasibility Study, FAB CE produced a CBA. The CBA quantified the impact of three scenarios, the Static, Dynamic (big bang) and Dynamic (gradual). The CBA does not present any benefits from the initial scenario. It is not clear if this is because the initial scenario provides not quantifiable benefits or if they are incorporated into the benefits of the static scenario. The estimated benefits are outlined in the Figure 4-26 below; the schemes are expected to cover their costs by 2013.

Figure 4-26: Estimated benefits from the FAB CE initiative

Impact	Static	Dynamic (big bang) (additional)	Dynamic (gradual) (additional)
Direct	€109.9 million	€3.3 million	€9.3 million
Indirect	€237.7 million	€48.2 million	€35.2 million
Costs	€39.0	€17.8 million	€19.7 million
NPV	€308.5 million	€33.8 million	€24.9 million

Note: The definition of 'direct' and 'indirect' costs and benefits in the FAB CE is the reverse of that we use here. We defined direct as meaning direct financial benefits to the ANSPs, which should be reflected in lower unit rates, and indirect as all other benefits.

4.6.22 As a proportion of 2006 Total Economic cost (€407 million for direct costs + €69 million for delay costs + €66 million for flight efficiency costs), the static scenario is projected to produce net benefits of 1.1% in 2013 and 5.5% in 2018. In the Dynamic big scenario this reduces to 1.1% and 3.9% respectively and in the Dynamic gradual scenario to 1.1% and 5.0%. In all scenarios 53% of the benefits are derived from improvements to flight efficiency and delay in 2013 and 55% in 2018.

4.6.23 A more detailed description of the CBA is outlined in Chapter 6. However, the main source of benefits is derived from savings in delay and flight-efficiency improvements. Other smaller improvements come through ATCO productivity. There is also an explicit assumption about wage increases and convergence. These are partially offset by the costs of simulation studies and setting up the JCMACB.

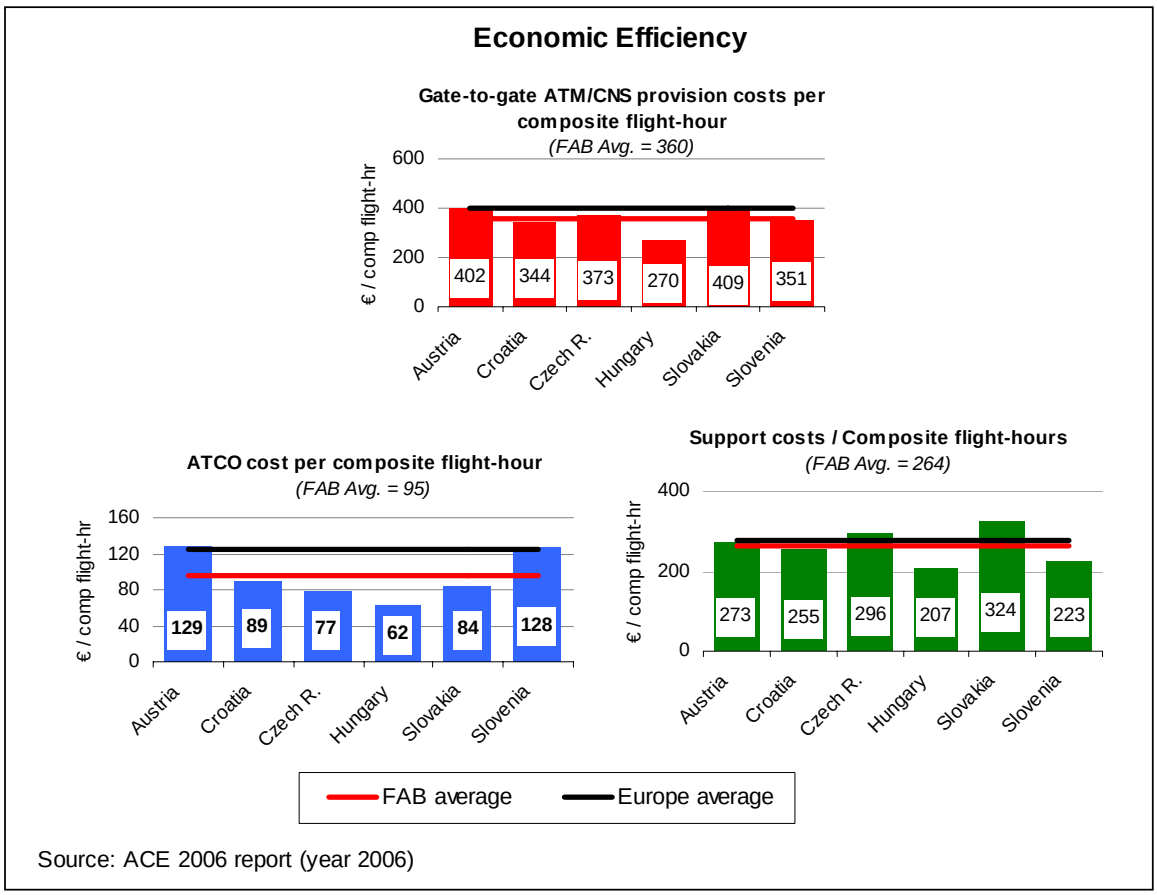
KEY PERFORMANCE INDICATORS

4.6.24 Figure 4-27 below shows the main key performance indicators for cost-efficiency, operational efficiency and safety for the FAB Central Europe.

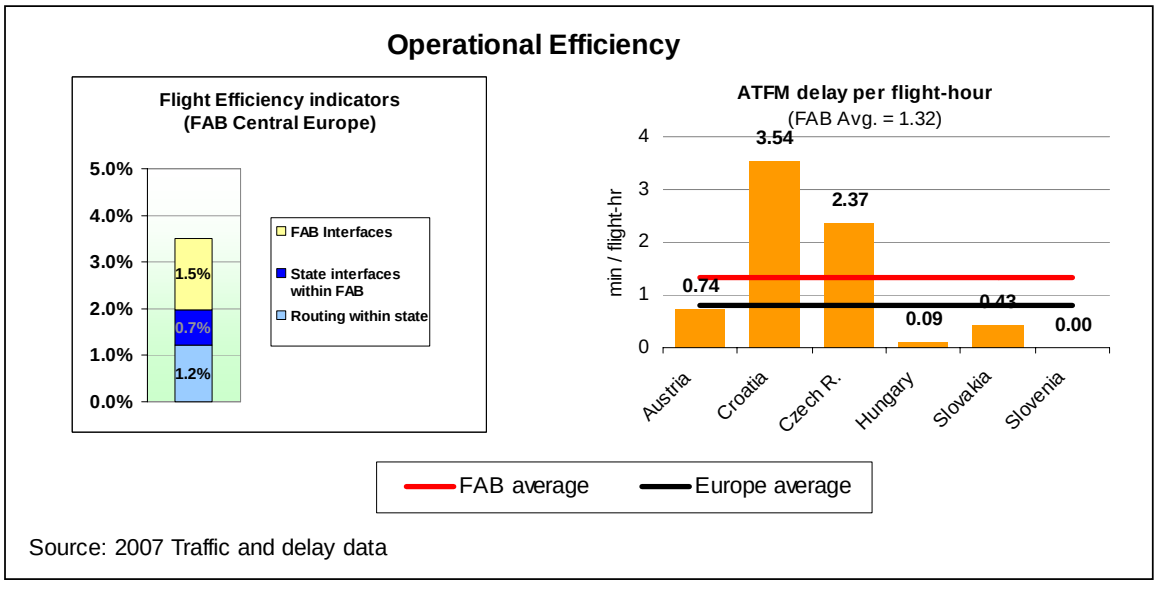
4.6.25 There are high levels of ATFM delays in ANS CR and Croatia, however improvement are expected during 2008 following investments in capacity. A

large proportion of the horizontal flight extension indicator lies outside the FAB and relies on inter FAB co-operation.

Figure 4-27: FAB CE Key Performance Indicators



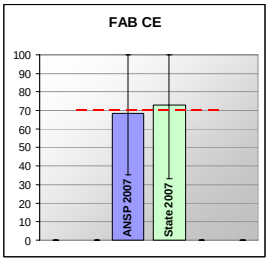
Source: ACE 2006 report (year 2006)



Source: 2007 Traffic and delay data

Safety

Safety Maturity

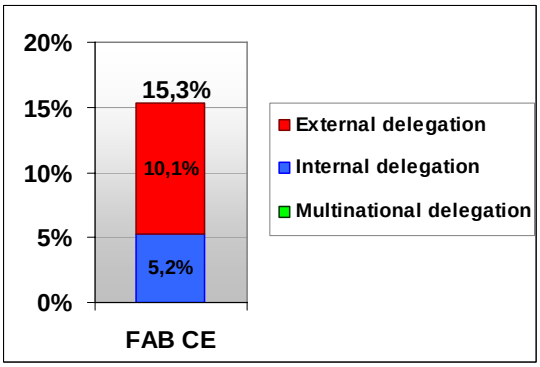


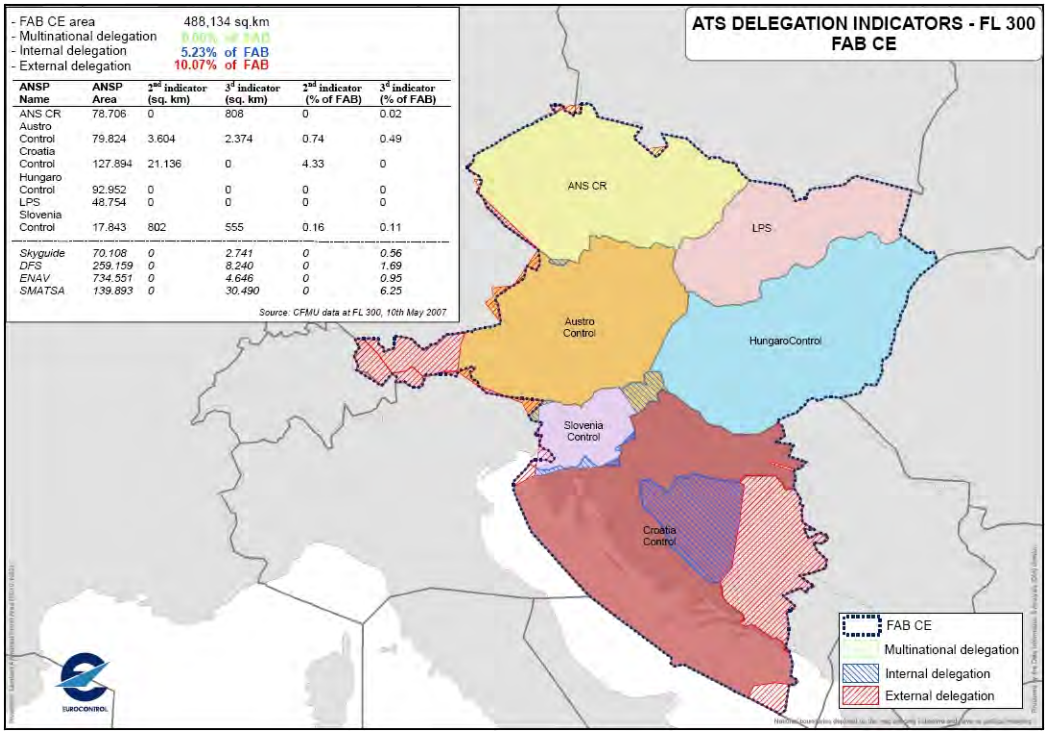
ESARR Implementation

	ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
Due fully by:	05-11-2007	01-01-2002		31-03-2008	13-07-2003		05-04-2004		11-04-2005	
State	Reg	ANSP	Reg	AST sent	ANSP	Reg	ANSP	Reg	ANSP	Reg
Austria	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bosnia & Herzegovina	Late	Late	Late	No report	Late	Late	Late	Late	✓	✓
Croatia	✓	✓	Late	No report	✓	Late	Late	Late	✓	Late
Czech Republic	Partial	✓	✓	✓	✓	Partial	✓	Partial	✓	✓
Hungary	Planned	✓	Partial	✓	✓	Partial	✓	Partial	✓	✓
Slovakia	Late	✓	✓	✓	✓	✓	✓	Late	✓	✓
Slovenia	✓	✓	✓	No report	✓	✓	✓	Late	Late	Late

Source: LCIP 2008-2012 except for Austria following comments received during Draft Final Report consultation

ATS Delegation





Source: EUROCONTROL 2008

AIRSPACE USERS VIEWS[17]

4.6.26 IATA has been involved in the FAB CE Feasibility Study with Austrian Airlines' representatives being on the financial and operational working groups. The results of the Feasibility Study were also distributed to IATA members. However, there is a perception that their opinions were largely ignored during the feasibility work, despite written comments and discussions. IATA has accepted an invitation to join the Steering Group for the next phase of FAB CE development.

4.6.27 The users believe that the main initial benefit from the FAB is to move away from a philosophy of mistrust between parties (mainly ANSPs), created from the top-down approach of the CEATS concept, to a spirit of FAB "trust" and greater co-operation. However, users consider the targets for improvements articulated in the FAB CE Master Plan to be very limited.

4.6.28 IATA has a number of misgivings about the FAB CE CBA, in particular believing that the reference case is too pessimistic. Issues with the CBA included:

- Not explicitly addressing consolidation of support functions such as common training, etc;
- Timeline – where any tangible benefits are only in the long run;
- Delays should be addressed by effective capacity ATCO planning and not shown in the reference case – it is not appropriate to monetarise delays savings in the medium and long term where they result from inadequate planning.

STAFF VIEWS

ATCEUC[18]

4.6.29 The CATCU union has already expressed its concerns about the way in which the project is developing. It is not satisfied with the level of social dialogue and does not accept ETF as the official representation of ATCOs: this should be ATCEUC.

ETF[19]

4.6.30 Staff representatives have been disappointed over their lack of involvement in the FAB Central Europe. During the initial stages, the National Trade Unions were not involved. After national and European pressure, a Stakeholder meeting was organized in March 2008, and a presentation by FAB CE management was made.

4.6.31 The ETF view is that the Staff Involvement level in the FAB CE is far from satisfactory.

PRC ASSESSMENT

4.6.32 FAB CE has made significant progress since the PRC's Interim Report. Building on CEATS experience, it has completed and published a Master Plan, a Feasibility Study/CBA and a Safety Assessment over the course of one year.

4.6.33 FAB CE partners have signed a Memorandum of Cooperation between ANSPs (May 2008) and a Declaration between Member States (June 2008), setting out a

17 A summary of IATA views from stakeholder consultation.
18 See footnote 8
19 See footnote 9

clear path for the next stage of FAB development. The MoU between States is currently under development.

4.6.34 There is a perception that there is an increased trust between members of the FAB. The staged approach to development, with an initial, static and then dynamic changes shows an intention to build momentum. A pragmatic approach to staged changes has been taken, with the implication that significant benefits will take some time to materialise. There is a danger that convergence of wages and conditions (to some of the higher levels in the FAB) may significantly diminish the potential benefits of the FAB.

4.6.35 However, the precise nature of the changes to be introduced at each stage of the development is as yet unclear and it is expected that the CBA will be revised and made more precise during the next stage of development.

4.6.36 In fact, the CBA is reliant on many assumptions, some of which are debatable, and the benefits are not expected until after 2014, which is later than hoped for. However they have identified quantified performance targets based on the results of the Feasibility Study - even if the cost-efficiency targets cannot be considered as particularly challenging.

4.6.37 Given the range of operational concepts currently in place it is difficult to find a common denominator and meet the explicit objective that the FAB creates a win-win situation for each individual partner in order to "survive" as a group. This will require a degree of flexibility and the potential that members may join with different speeds, weakening the FAB benefits. This is a significant risk.

4.6.38 States/NSAs have now a responsibility to steer the Development Phase so as to ensure commitment, delivery, challenge the ANSPs targets, and learn from past lessons.

4.6.39 To date there has been very limited social dialogue. The PRC understands that FAB CE is developing a Social Dialogue Consultation team with an initial step of a workshop with social partners in November 2008.

4.7 FAB Europe Central (FAB EC)

CONTEXT AND HISTORY

4.7.1 In 2005, four Member States (Germany and the Benelux countries) together with the EUROCONTROL Maastricht Upper Airspace Control (MUAC) initiated a FAB Europe Central project. In parallel there was another FAB initiative ongoing between France and Switzerland. In autumn 2006, there was a decision of the High Level Policy Group to re-orient the FAB Europe Central project combining the membership of the two initiatives, so in total 6 States and 7 ANSPs participate in the FAB EC initiative.

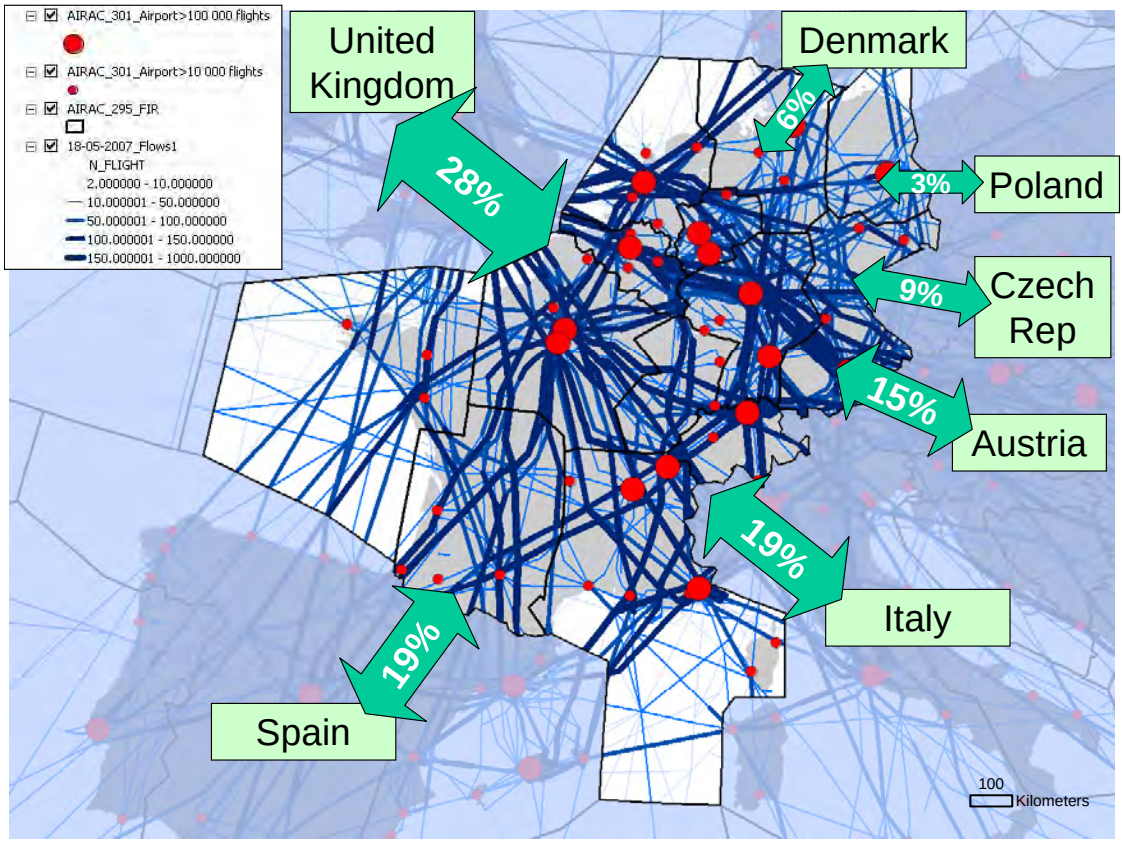
4.7.2 The UK is a collaborative partner to FAB EC. In early 2008 the UK proposed that the southern part of the UK should join FAB EC. Being too late to introduce a new State at this stage, it has been agreed that the area to the southeast of London will be given special consideration when addressing airspace design. The UK will be involved at a working and decision making level.

SCOPE: AIRSPACE AND GEOGRAPHY OF THE FAB

4.7.3 The existing organisation of the airspace which forms the FAB is shown in Figure 4-28 below.

4.7.4 FAB EC comprises some of the busiest airspace in Europe (as measured through density and complexity). It includes three major intercontinental hub airports (Paris, Amsterdam and Frankfurt) and its proximity to the London airports and flows across the North Atlantic mean it is a very important part of European airspace. The traffic flows reflect its location in the core of Europe.

Figure 4-28: FAB Europe Central airspace region



4.7.5 The Figure 4-29 below shows the interconnections between major airports in FAB EC.

Figure 4-29: Main hub airports in FAB Europe Central area

DEVELOPMENT OF THE FAB

4.7.6 The Feasibility Study was conducted in three phases:

- Phase 1 - 2006 to 2007, identification, description and initial analysis of concepts;
- Phase 2 - January 2008 - April 2008, final analysis and evaluation; and
- Phase 3 - April 2008 - June 2008, consolidation of results.

4.7.7 The Feasibility Study Report was completed in July 2008. The aim of the study was to identify possible areas for cooperation between the ANSPs with the aim of improving performance and to propose an implementation plan for these areas.

4.7.8 From an institutional/legal perspective three models of cooperation have been identified “contractual cooperation”, “alliance structure” and “single structure”. The study concluded that contractual co-operation and alliance structures were possible, the single structure would require further study.

4.7.9 The CBA primarily reported on the results of the co-operation model with a separate indication of the additional benefits from the other models under consideration.

4.7.10 The study was a result of collaboration between the Ministries of Transport and Defence of the six States, and the civil and military air navigation service providers.

EXISTING OPERATIONAL CONCEPTS

4.7.11 The following four elements are used to provide a brief description of the existing operational concepts in each of the FAB’s ANSPs:

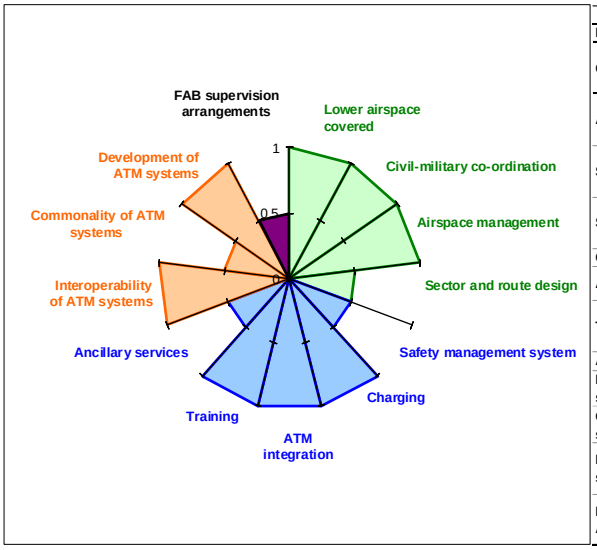
- **En-route civil-military arrangements**: There are a wide range of civil-military arrangements in FAB EC. In Belgium and the Netherlands there are remote locations for civil and military centres but a fully integrated ATC system; in France location is similarly remote, but with only a partially integrated ATC system; DFS and Skyguide are civil/military integrated and provide services to OAT and GAT, with Skyguide also providing additional defence services; a DFS unit co-located with MUAC provides ATC services to OAT over northern Germany.
- **Staff management in civil ANSPs**: There are a wide range of staff management arrangements in the ANSPs: In Maastricht there is team rostering with overtime; in DSNA team rostering with no overtime; DFS and LVNL have team and individual rostering respectively allied to a system of credit and debit hours; in Skyguide and Belgocontrol there is individual rostering with overtime/credit hours.
- **Characteristics of pre-tactical ATFCM/ ASM services**: LVNL, Skyguide, DFS and Belgocontrol each have one Airspace Management Cell, DSNA is moving towards a centralised and integrated ASM/ATFCM function. Belgocontrol, Skyguide and LVNL each have 2 FMPs, while DFS has one FMP for each of its four ACCs.
- **Civil ACC main functions**: A range of functions and organisation are found across FAB EC. Maastricht is responsible for en-route upper airspace in Netherlands, Belgium, Luxembourg and part of Germany. Skyguide has two ACCs providing en-route, TMA and approach services. LVNL and Belgocontrol ACCs are responsible for TMA and approach. DFS has one ACC responsible for en-route upper airspace (Rhein) and three ACCs responsible for en-route, approach and TMA (München, Bremen and Langen). DSNA has five ACCs covering en-route and TMA with stand alone radars for approach.

4.7.12 There are many differences in the operational concepts of the ANSPs contained in FAB EC. These have the potential to provide obstacles for introducing changes to the FAB.

CHANGES PLANNED FOR THE FAB AND ARRANGEMENTS FOR THEIR INTRODUCTION

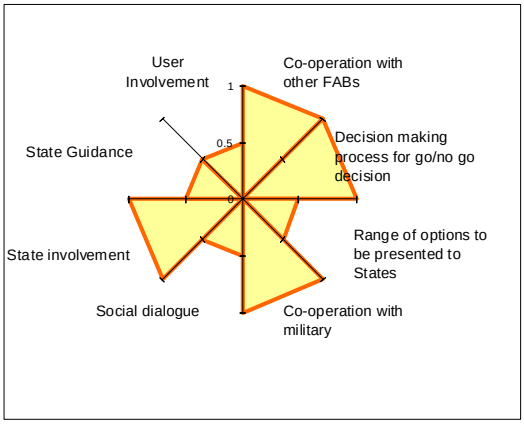
4.7.13 In Figure 4-30 and Figure 4-31 we present two frameworks for the Europe Central FAB. The first describes the key changes planned to be introduced by the FAB, the second describes the arrangement for achieving these changes. These are based on the changes introduced by the FAB, or planned by the FAB.

Figure 4-30: Changes planned by the FAB



Characteristic	Justification
Lower airspace covered	Airspace will be vertically integrated
Civil-Military co ordination	Considering advance FUA levels 1-3, joint civil/military ATFCM=ASM, and joint ASM in real time. .
Airspace management	Plan to establish a FAB ATFCM-ASM function to co-ordinate and optimise capacity provision, traffic flows and use of airspace for the entire FAB
Sector and route design	This will be integrated but not yet clear if a single unit or integrated function/approach will be pursued will be implemented in medium/ long term
Safety Management System	Seeking common safety management system. Will only develop common SMS unit if institutional arrangements allow
Charging	Long term objective is uniform unit rate
ATM integration	Optional single ANSP model considered subject to further investigation
Training	Cooperation intended in training. Single training organisation not considered till after 2020 for ATCOs but for ATSEP and Military earlier
Ancillary services	Concepts for AIS and MET under development
Interoperability of ATM systems	Cooperation intended in technical systems to facilitate interoperability
Commonality of ATM systems	Gradual progression towards common specification and architecture (FDP)
Development of ATM systems	There is an aspiration for common procurement and development which will incrementally be developed for the FAB
FAB Supervision Arrangements	A FAB NSA is identified in the roadmap to mature over the period 2008-13, however details are not provided in the feasibiltiy study

Figure 4-31: Arrangements for introduction of the FAB



Arrangement	Justification
Co-operation with other FABs	Working closely with UK-IR and Blue Med, co-ordination with FAB CE
Decision making process for go/no go decision	Clear responsibilities for governance (High Level Policy Group). States agreed to sign Declaration of intent and to declare FAB in 2011/12
Range of options to be presented to States	In some areas there will be multiple proposals, in other areas only 1. The feasibility study will not present fundamentally different institutional models
Co-operation with military	Civil/military working group has been established
Social dialogue	Some trade union involvement, however they consider still room for improvement
Involvement of States	States involved in High Level Policy Group and Steering Group and within some of the working groups. Will be involved with SSB, HLIB and FPSG.
Guidance from States to start and support FAB discussions	Have received guidance and clear targets, but are some areas further guidance is required e.g. mechanism for convergence costs.
Involvement of users	FAB has consulted extensively with user. No evidence provided that the FAB have responded to users concerns

TIMESCALES

4.7.14 Key historical and planned dates are:

- December 2007: Completion of Phase 1 of Feasibility Study (identification, description and initial analysis of options);
- April 2008: Completion of Phase 2 of Feasibility Study (final analysis and evaluation);
- June 2008: Completion of Phase 3 of Feasibility Study (consolidation of results). Adoption of the Feasibility Study report by the High Level Policy Group;
- September 2008: Presentation to the Single Sky Committee;
- November 2008: Declaration of Intent signed by the States. ANSP agreement signed by the 7 ANSPs;
- 2009: trial of the new ATFCM-ASM function involving a sub-set of ANSPs;
- 2010: Treaty between States to be ready for signature;
- 2010-2011: Treaty to enter into force (after ratification by the States);
- 2009-2013: Implementation of initiatives to improve the hotspots;
- 2018+: Implementation of other FAB related initiatives.

KEY PRIORITY AREAS FOR THE FAB

4.7.15 The initiative has developed several decision criteria to assess the feasibility of the FAB. These were initially defined in the Project Charter. The main decision criteria are:

- Increased safety;
- Reduced environmental impact;
- Increased capacity;
- Increased cost-effectiveness;
- Increased flight-efficiency;
- Increased military mission effectiveness.

4.7.16 In addition to the above, additional criteria have been identified. These include:

- Compliance with SES regulation;
- Development of a realistic institutional roadmap; and
- A socially acceptable implementation plan.

4.7.17 In the Feasibility Study the initiative identified that a key driver for the establishment of the FAB was the requirement to establish a common operational concept. The four main building blocks of the common operational concept are:

- Common information management (as part of ATM service delivery management);
- Airspace organisation and management;
- Demand and capacity balancing (through ATFCM); and
- Air traffic control (covering the components of traffic synchronisation and conflict management).

4.7.18 The airspace redesign is planned to take place in three stages – the first stage will look to address the hotspots (2008-2013), the second stage will re-sectorise and re-optimise the location of military areas (2014-2018), and the third stage will introduce tailored route in very high airspace (this will not happen before 2018).

4.7.19 The initiative envisages that a single unit rate is the best approach to dealing with issues around airspace design changes leading to traffic transferring between states. However, to date this view is largely based on judgement rather than on any analytical work. The FAB plans to introduce the single charging zone and the single unit rate before the introduction of the operational improvements in the congested 'hotspots', which involve cross-border sectorization.

4.7.20 As part of the common operational concept, technical measures have been identified to ensure timely implementation. These technical measures are also intended to overcome the present fragmentation of ATM systems in the core area of Europe and ensure that future developments follow a joint roadmap towards common technical systems and common technical services.

4.7.21 Initially each ANSP will have its own safety management system (SMS), as it is felt that initially the FAB's institutional model will not facilitate a common system. However, once the FAB institutional model develops to a point which

allows for the integration of functions then the FAB would look to develop a common SMS.

4.7.22 The initiative plans to co-ordinate training between the ANSPs and where possible develop harmonise ATCO training.

4.7.23 In addition to the main areas of potential cooperation, the FAB has also identified three other opportunities:

- Aeronautical information services (AIS);
- Meteorological services;
- Contingency.

4.7.24 FAB EC has identified 8 Task Forces designed to take priority in their implementation. These include: ATFCM/ASM, Hotspots, Common Training, VCS, Common Data Services, ANSP Contract, Enhanced use of OLDI and AGL).

4.7.25 Finally, Figure 4-32 below details the ANSP performance targets that the initiative identified in the Feasibility Study. These were agreed by the States to give guidance to the experts developing the feasibility study. The feasibility study shows these targets can be reached. Following this the States have expressed their intention to develop aspirational goals (which will be published in the Declaration of Intent). ANSPs, States and Military have to consider then how to transfer into common performance management process.

Figure 4-32: FAB EC Performance targets / objectives

Area	Target
Capacity	The forecasted 50% increase in civil air traffic by 2018 would be accommodated, taking into account the current agreed ATFM delay target of 1 minute per flight and the militaries needs.
Safety	Despite the civil traffic growth the current absolute number of air navigation services (ANS) induced accidents and risk bearing incidents shall not increase.
Cost-effectiveness	The expected 50% increase of civil traffic by 2018 shall not result in more than 25% increase of total cost.
Flight-efficiency	A reduction in the EC FAB area in the average route extension of two kilometres per annum until 2010, increasing to an accumulated total of 10 km by 2018.
Environment	Improvements of routes, flight profiles and distances flown.
Military mission effectiveness	FAB EC development shall significantly contribute to improve military mission effectiveness by improvements of training capabilities and readiness as requested by States.

SIZE OF POTENTIAL BENEFITS

4.7.26 The provisional conclusions of Feasibility Study, completed in July 2008 but to be published in November 2008, outline the key potential benefits of FAB EC in the results of the CBA reported in Appendix G. This is covered in greater detail in Chapter 6 of this report.

4.7.27 The Feasibility Study provisional results assume an alliance structure (although other institutional models were considered as additional benefits to this core CBA), the estimated benefits are presented in Figure 4-33 below:

Figure 4-33: Provisional estimated benefits from the FAB EC initiative

Year	Direct Benefits (PV)	NPV of ANSPs' cash flow	Project NPV
2014	€376 million	€195 million	€571 million
2020	€3,147 million	€685 million	€3,832 million
2025	€6,196 million	€1,099 million	€7,295 million

Note: **'Direct benefits' are defined as the savings in delays and flight-efficiency gains.**

4.7.28 The main sources of the benefits are improvements in flight-efficiency and savings from reduced delay and a reduction in unmet demand. Smaller savings are found from AIS, training, CNS, common ATM systems, MET and productivity improvements.

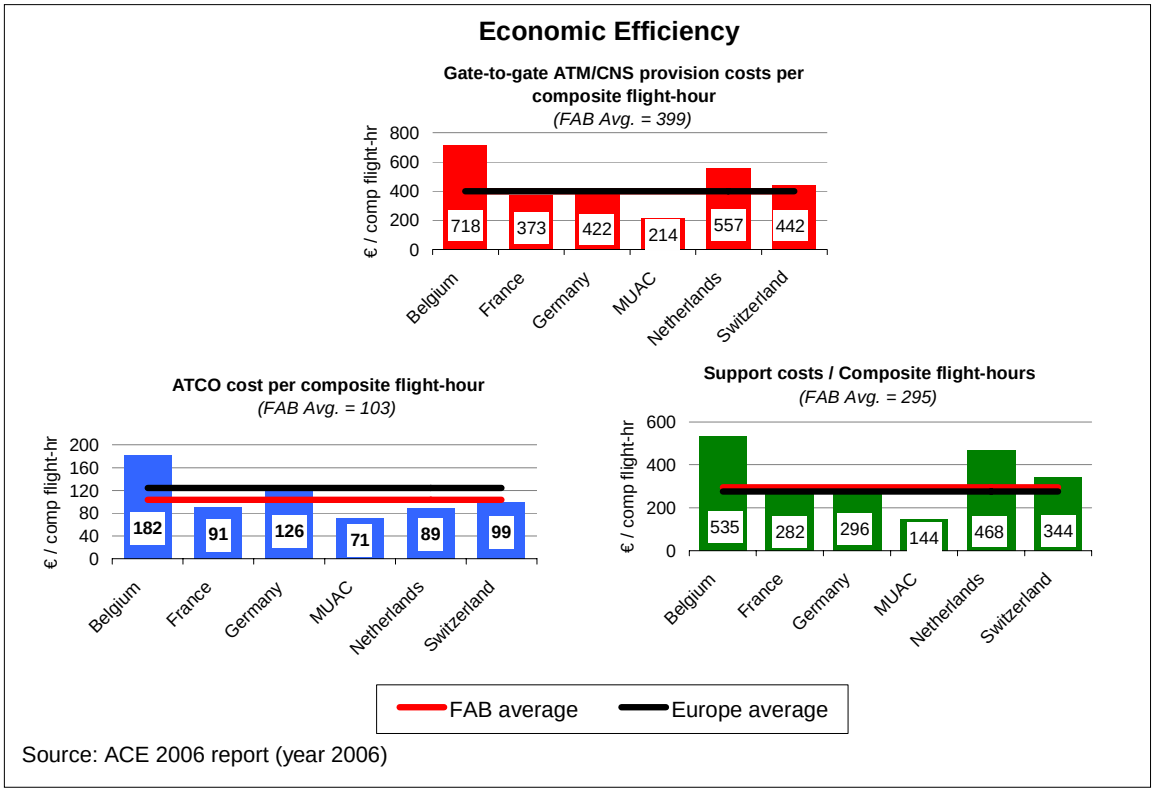
4.7.29 As a proportion of 2006 Total Economic cost (€2385 million for direct costs + €226 million for delay costs + €535 million for flight efficiency costs), the FAB is projected to produce net benefits of 8.3% in 2013 and 36.5% in 2018. Flight efficiency and delay contribute 77% of the benefits in 2013 and 83% in 2018 (based on approximate values derived from graphical figures).

KEY PERFORMANCE INDICATORS

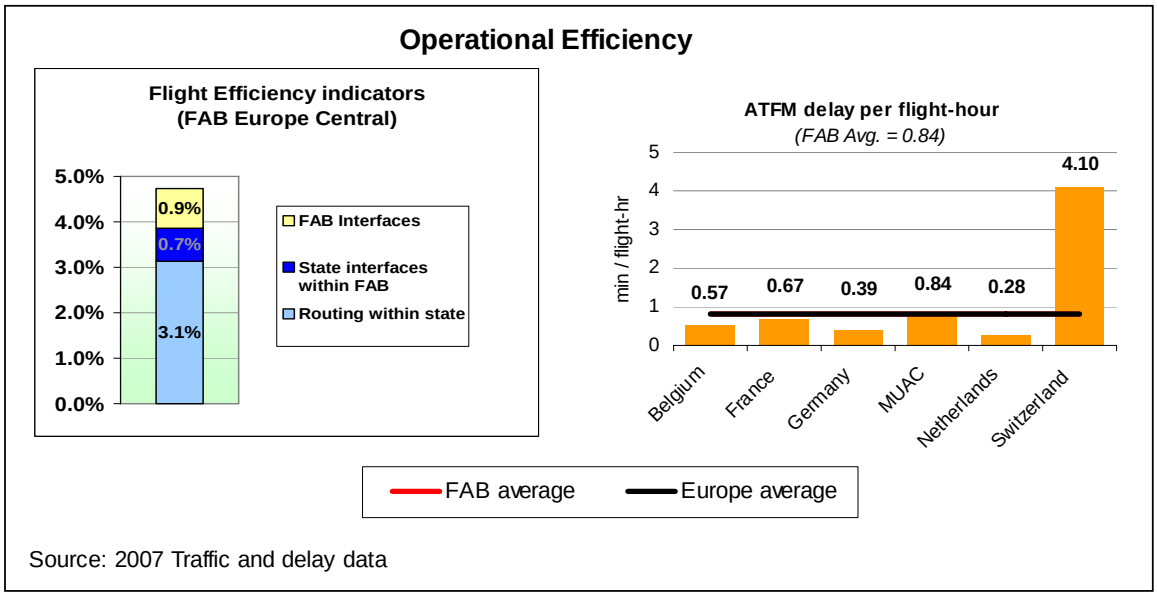
4.7.30 Figure 4-34 below shows the main key performance indicators for cost-efficiency, operational efficiency and safety for the FAB Europe Central and its constituent ANSPs.

4.7.31 There are significant differences between ANSPs for the cost-effectiveness measures, reflecting the range of operational arrangements discussed earlier. There are particularly high ATFM delays in Switzerland in 2007. Moreover, the horizontal route extension metrics indicate the potential for significant improvements to be found within the FAB.

Figure 4-34: FAB EC Key Performance Indicators[20]



Source: ACE 2006 report (year 2006)

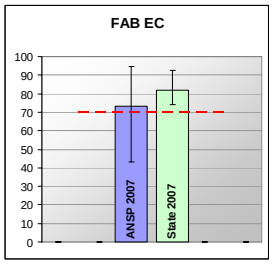


Source: 2007 Traffic and delay data

20 No indicators have been included for Luxembourg

Safety

Safety Maturity

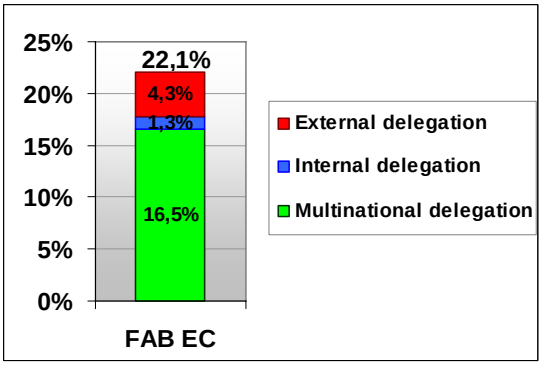


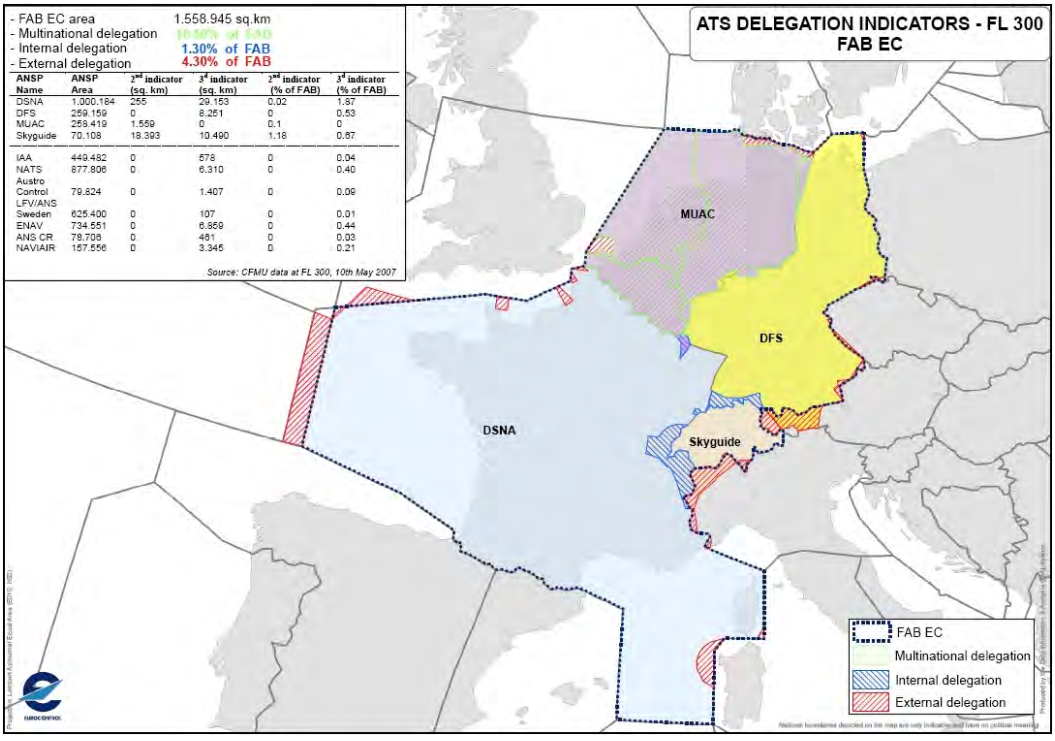
ESARR Implementation

	ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
Due fully by:	05-11-2007	01-01-2002		31-03-2008	13-07-2003		05-04-2004		11-04-2005	
State	Reg	ANSP	Reg	AST sent	ANSP	Reg	ANSP	Reg	ANSP	Reg
Belgium	Partial	✓	✓	✓	✓	✓	✓	Late	✓	Partial
France	✓	✓	✓	✓	✓	✓	✓	✓	Late	Partial
Germany	✓	✓	✓	✓	✓	✓	✓	Partial	✓	Partial
Luxembourg	Partial	✓	✓	No report	✓	✓	✓	Partial	✓	Partial
Netherlands	Partial	✓	Late	✓	✓	Partial	✓	Partial	✓	Partial
Switzerland	Partial	✓	✓	✓	✓	✓	✓	Partial	✓	Late

Source: LCIP 2008-2012

ATS Delegation





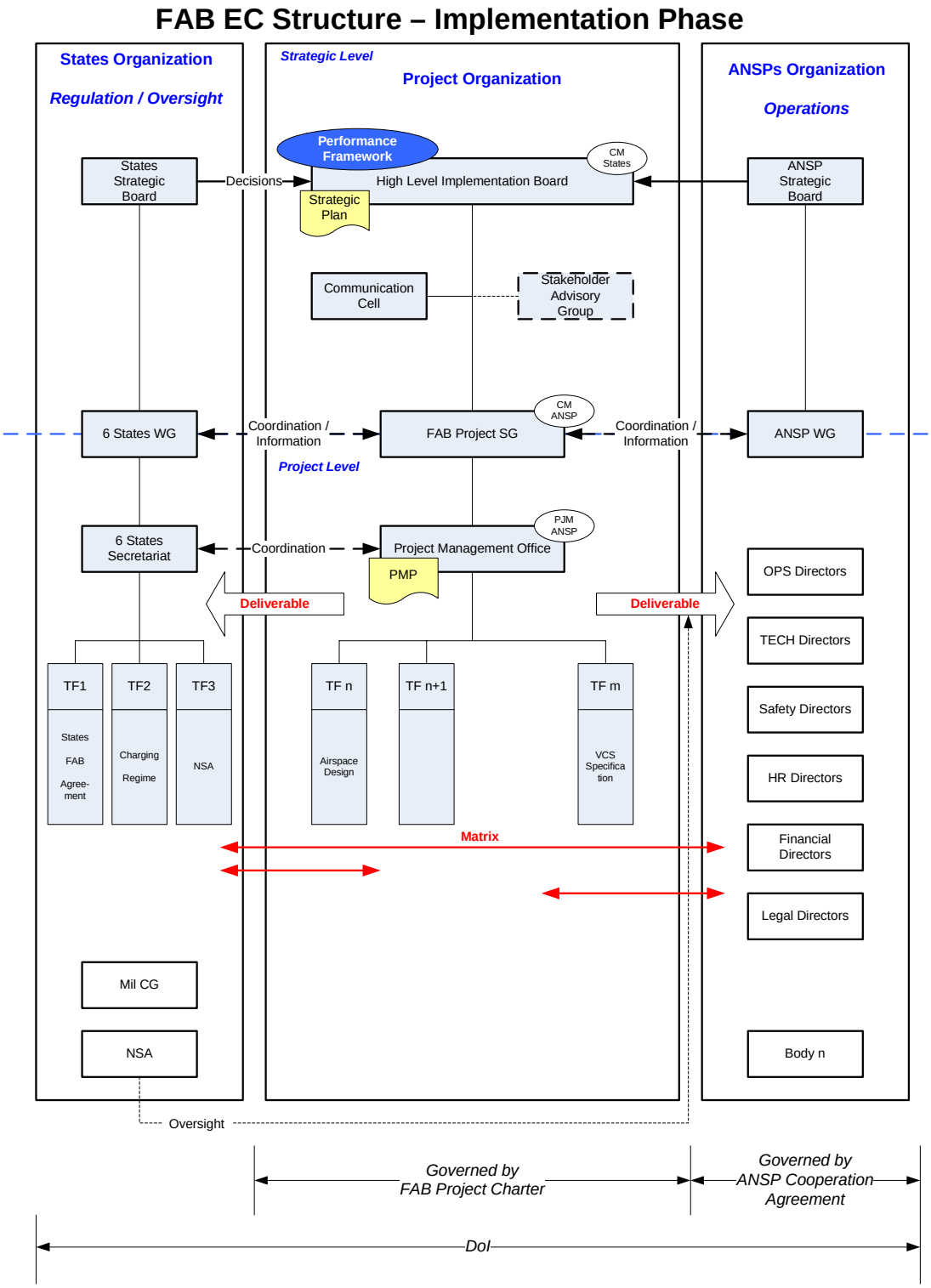
Source: EUROCONTROL 2008

GOVERNANCE ARRANGEMENTS

4.7.32 The Governance arrangements for the FAB EC Implementation phase are organised into three pillars as outlined in Figure 4-35 below

- **The State Pillar:**
  - **States Strategic Board**: providing strategic and regulatory oversight. Overseeing the six States working group and associated task forces;
  - **6 States Working Group**: reports to the States Strategic Board. Its integrated project plan allows initial drafting of the States Agreement until June 2009. ANSPs can be involved as needed and the Project Management Office can provide support. Five Task Forces began work in Autumn 2008:
    - State agreement Task Force (chaired by Switzerland);
    - Liability – Legal matters Task Force (chaired by France);
    - NSAs Task Force (chaired by Belgium);
    - Performance Task Force (chaired by Germany);
    - Charging Task Force (chaired by the Netherlands).
- **The Project pillar:**
  - **High level implementation Board**: responsible for the performance framework and FAB strategic plan and chaired by the States;
  - **FAB project steering group**: overseeing the project management office chaired by the ANSPs;
  - **Project Management Office**: managing the FABEC implementation, in particular through the work of associated task forces (Eight for the moment, some more are planned in 2009).
- **The ANSP pillar:**
  - **ANSP strategic board**: set up at CEO level, the ASB will:
    - Support the implementation of FABEC;
    - Foster a culture of co-operation;
    - Coordinate and implement common policies;
    - Decide on common ANSP positions;
    - Manage the operational implementation of project deliverables;
    - Agree on social dialogue principles and activities.
  - **ANSP working groups**: set up at Director level to prepare the decisions of the ANSP strategic Board.

Figure 4-35: Governance arrangements for the Implementation phase



4.7.33 The project organisation will be governed by the FAB EC Project Charter. The ANSP organisation is governed by the ANSP Cooperation Agreement.

AIRSPACE USERS VIEWS[21]

4.7.34 The users consider that FAB EC is politically the most challenging to engender co-operation between the constituent countries, and operationally the most exciting given the magnitude of the potential benefits associated with this large FAB.

4.7.35 The users also consider that a real challenge of FAB EC will be to effectively involve the Military community in order to address the Military areas and provide a single cross-border airspace design and management system. There are significant benefits from re-organisation of the approach to airspace design and routing in the core area. Moreover, significant benefits were expected from FAB EC if the ANSPs aligned their investment programmes and through that the interaction with the SESAR programme.

4.7.36 On the other hand, airspace users expressed disappointment that the timeline to achieving full benefits from FAB EC is only 2018. Moreover, the operational focus of the FAB is limited given the scope for significant synergies in pursuing common training, procurement, and other support functions.

4.7.37 The users accepted that they have been involved from the start of the FAB EC Feasibility Study in a sufficient way.

STAFF VIEWS

ATCEUC[22]

4.7.38 ATCEUC acknowledges the significant effort and contribution of the Feasibility study delivered by experts. However, it highlights the lack of political guidelines and key targets for the FAB as being detrimental to successful development.

4.7.39 ATCEUC considers that MOSAIC is a solution to the difficulties arising in the development of FAB EC. They feel the current FAB EC plans are not ambitious enough. This initiative is presented in Annex III.

4.7.40 ATCEUC supports the development of the co-operation evolutionary model.

ETF[23]

4.7.41 Staff accept that there has been some social dialogue as part of the gestation of the FAB EC Feasibility Study. However, there is still, in their opinion, room for improvement. Meetings were organised by ANSP CEOs at working group level (and Project Management Office level) and staff were involved in the stakeholder forum.

4.7.42 However, staff view the social dialogue to be limited to information, and no real consultation process in which the staff can be directly involved in the decision making process of the project. ETF has made proposals to improve the situation: a social forum at CEO level, involvement of the trade unions in working groups. No answer has yet been received to these proposals from FAB management.

21 A summary of IATA views from stakeholder consultation.
22 See footnote 8
23 See footnote 9

PRC ASSESSMENT

4.7.43 FAB EC has made significant progress since the PRC's Interim Report (February 2008) with the completion of a detailed Feasibility Study in July 2008. Development of this Study has required significant amount of coordination as well as human and financial efforts.

4.7.44 FAB Europe Central is one of the most ambitious in terms of the scope of complex airspace covered and the number of countries with different operational concepts it comprises. This means, that the size of the potential benefits are significant, as illustrated by the CBA conducted for the Feasibility Study.

4.7.45 To date, a large amount of effort has been placed on important operational and technical issues (Civil-Military, ATFCM/ASM function at regional level, airspace optimisation, convergence towards common technical systems, etc.). As other FABs have demonstrated, only if acceptable governance arrangements can be agreed will these benefits be materialised.

4.7.46 There is a significant risk that a long term institutional solution for FAB EC will prove difficult with very different existing institutional and governance arrangements in Member States. The convergence of social conditions will require disciplined cost management so as to achieve the desired common charging zone.

4.7.47 Several cooperation scenarios have been examined in the FAB CE feasibility study report: co-operation agreement, operational alliance (some joint functions) and merger. A progressive evolution is foreseen. It is interesting to note that a representative ATCO organisation advocates the full merger scenario in the MOSAIC project. More details about MOSAIC can be found in Annex III.

4.7.48 The benefits from improved airspace design to deal with cross-border areas (hotspots) will require strong involvement and commitment of all parties (in particular the military). There will also be a need to ensure consistency with major TMAs and interaction with the southern part of the United Kingdom which forms a part of FAB EC's work programme.

4.7.49 The FAB EC CBA identified significant potential benefits. However, these benefits from operational and technical improvements are not expected before 2014, which is later than stakeholders hoped for. There is, to date limited evidence of quick wins (however, we understand that eight Task Forces have been prioritised: ATFCM/ASM, hotspot, common training, VCS, Common Data Services, ANSP contract, Enhanced use of OLDI and AGL). The willingness to address service provision issues is not yet proven, although a scenario was discussed in the feasibility study and is likely to be subject to further investigation.

4.7.50 There have been clear performance targets agreed by ANSPs. These initial targets are ambitious for reducing horizontal route extension but not so for cost-efficiency.

4.7.51 If effective resolution of hotspots requires cross-border ATS delegation/cross border ATS provision in the core area of the FAB, possible constitutional issues may have to be solved in Germany (see section 7.2.17.h)).

4.7.52 The PRC understands that social dialogue will be addressed by a new forum for the next stage of the FAB EC's development.

4.8 NEFAB

CONTEXT AND HISTORY

4.8.1 The North European ATM Providers (NEAP), includes seven ANSPs:

– Avinor (Norway);	– NAVIAIR (Denmark);
– LFV (Sweden);	– Estonian ANS (Estonia);
– Finavia (Finland);	– ISAVIA (Iceland); and
	– IAA (Ireland).

4.8.2 NEFAB is being developed by all these ANSPs with exception of IAA. LGS (Latvia) has an observer status in NEAP but not in NEFAB.

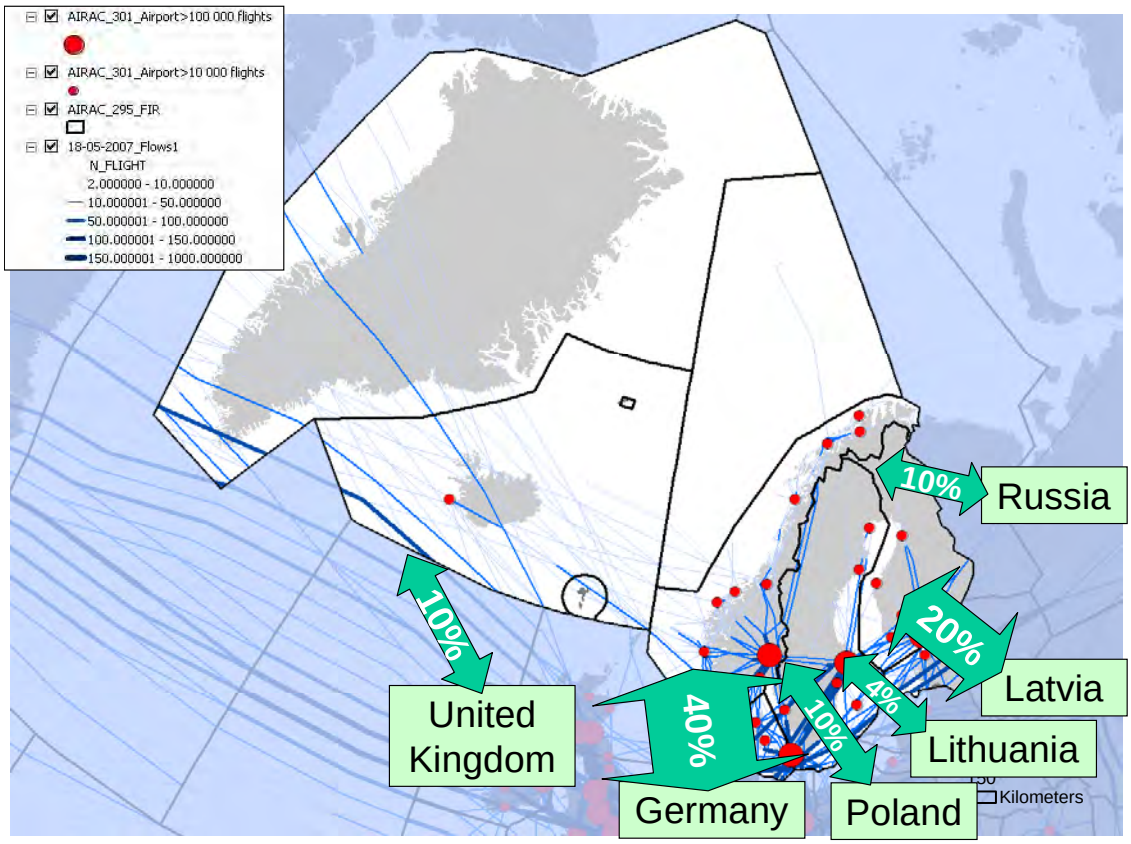
4.8.3 Two of the NEFAB members, Naviair and LFV/ANS, are also working together on the NUAC FAB initiative (see Section 4.9), which is considerably more advanced than NEFAB. It is envisaged that in due course NUAC is expected to be one service provider within NEFAB.

SCOPE: AIRSPACE AND GEOGRAPHY OF THE FAB

4.8.4 The existing organisation of the airspace which forms the FAB is shown in Figure 4-36.

4.8.5 There are significant flows of traffic from the south to the major airports in NEFAB (Stockholm, Oslo, Copenhagen and Helsinki). A significant portion of the airspace is oceanic, with delegation of ATS for Greenland to Isavia and NavCanada.

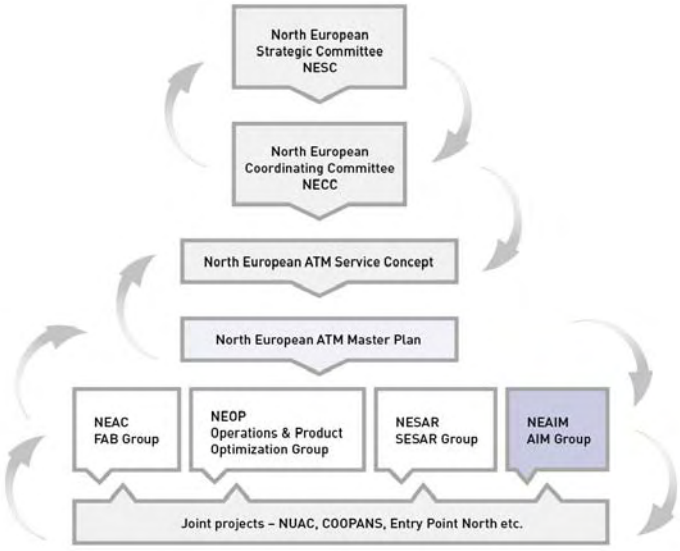
Figure 4-36: NEFAB airspace region



DEVELOPMENT OF THE FAB

4.8.6 NEFAB is one of the operational and technical initiatives that are being undertaken by NEAP ANSPs, with the scope of the North European ATM Service Concept, an agreement signed by the seven NEAP ANSPs on 10 May 2007 (See Figure 4-37). The stated objective of this agreement is to provide harmonised and cost efficient service to customers. As one of the elements of this, the North European Coordination Committee (NECC) assigned a WG to examine the possibility of a North European FAB. To date the WG has conducted five meetings. All the ANSPs, apart from IAA, are represented within the WG. IAA is kept informed about the progress of the FAB, through its membership of NECC.

Figure 4-37: NEFAB within the NEAP organisation



4.8.7 The FAB has published its pre-feasibility report in January 2008, leading to the official announcement as a FAB initiative in March 2008.

4.8.8 To date the initiative has been led by the ANSPs and there has been little involvement by the government or other stakeholders.

EXISTING OPERATIONAL CONCEPTS

4.8.9 The following four elements are used to provide a brief description of the existing operational concepts in each of the FAB's ANSPs:

- **En-route civil-military arrangements**: All ANSPs provide ATC services to GAT and OAT.
- **Staff management in civil ANSPs**: All ANSPs have individual rostering with overtime.
- **Characteristics of pre-tactical ATFCM/ ASM services**: Naviair and LFV each have an Airspace Management Cell. Naviar and EANS each have 1 FMP position. Finavia has an AMC and FMP for the Finland FIR at Tampere ACC. LFV has a FMP for each ACC. Avinor operates one FMP for each of its three ACCs.
- **Civil ACC main functions**: Naviair and EANS provide en-route, TMA and approach services through their ACC. Finavia provide en-route and TMA services through their ACCs and approach services are provided by stand-

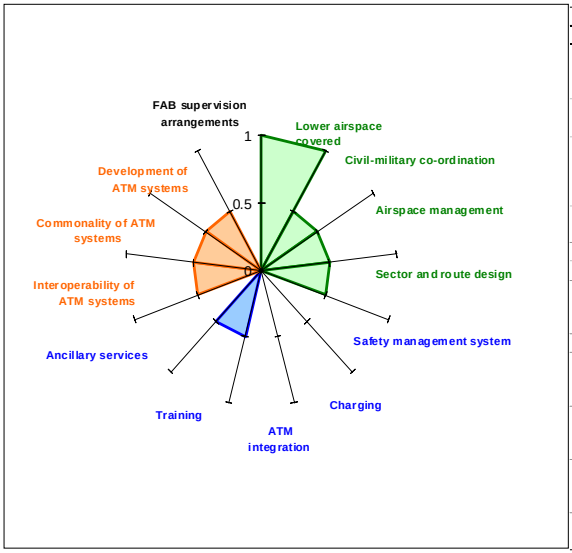
alone units. For LFV, en-route, TMA and approach are provided by two ACCs (Stockholm and Malmo) and in addition there are also some stand-alone approach units. For Avinor, en-route, TMA and approach are provided by ACCs (Oslo, Bodo) while Stavanger is the other ACC. There are also some stand-alone approach units.

4.8.10 There are many similarities in the operational concepts used across NEFAB. The large amount of oceanic airspace introduces some heterogeneity in this FAB which will have to be addressed carefully in the organisation of this FAB.

CHANGES PLANNED FOR THE FAB AND ARRANGEMENTS FOR THEIR INTRODUCTION

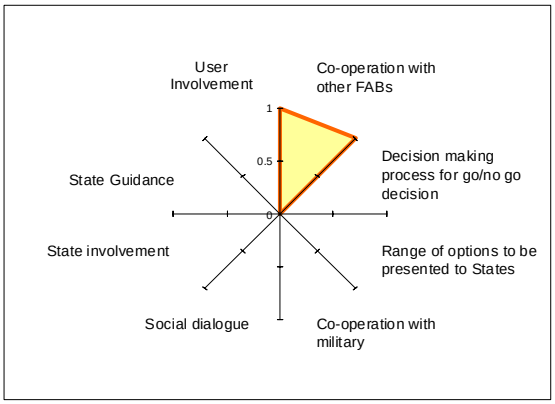
4.8.11 In Figure 4-38 and Figure 4-39 we present two frameworks for NEFAB. The first describes the key changes planned to be introduced by the FAB, the second describes the arrangement for achieving these changes.

Figure 4-38: Changes planned by the FAB



Characteristic	Justification
Lower airspace covered	All airspace is included except for control zones
Civil-Military coordination	Some early plans through NEAP for enhanced co-ordination, but no specific plans for a single CIV-MIL co-ordination unit
Airspace management	It is planned to establish a working group to evaluate whether a NMU for the FAB should be created
Sector and route design	Some changes to sector and route design have been identified through NEOP around the terminal areas and at the interface between Oceanic areas and Iceland
Safety Management System	Not under consideration at this stage
Charging	Not under consideration at this stage
ATM integration	Not under consideration at this stage
Training	Three NEFAB members are also participating in Entry Point North; it is also planned to harmonise training within NEFAB
Ancillary services	No plans for AIS or MET at this stage
Interoperability of ATM systems	A working group has been established to evaluate interoperability and possibly joint procurement of systems
Commonality of ATM systems	A working group has been established to evaluate interoperability and possibly joint procurement of systems
Development of ATM systems	A working group has been established to evaluate interoperability and possibly joint procurement of systems
FAB Supervision Arrangements	Not under consideration at this stage

Figure 4-39: Arrangements for introduction of the FAB



Arrangement	Justification
Co-operation with other FABs	Denmark and Sweden who are members of NEFAB are also members of NUAC; will also need to be co-operation agreements with UK/Ireland, and co-operation with Baltic planned.
Decision making process for go/no go decision	Unclear at this stage how a decision as to whether to proceed with a FAB would be made. Decision to proceed with feasibility study would be made by ANSP CEOs.
Range of options to be presented to States	Not determined at this stage.
Co-operation with military	Minimal involvement to date although some information exchange in certain States
Social dialogue	Minimal involvement to date although some information exchange in certain States
Involvement of States	Minimal involvement to date although some information exchange in certain States
Guidance from States to start and support FAB discussions	Minimal involvement to date although some information exchange in certain States
Involvement of users	Minimal involvement to date although some information exchange in certain States

TIMESCALES

4.8.12 A **pre**-Feasibility Study has been undertaken for NEFAB and during summer 2008 it was intended to:

- set up a project plan for the Feasibility Study;
- conduct a high level CBA (based on targets set rather than actual analysis of what will be achieved by the FAB);

- undertake analysis of possible showstoppers; and
- undertake a safety analysis.

4.8.13 On the basis of this work, at a meeting planned for 29 August 2008, the NESC (North European Strategy Committee, consisting of the CEOs of the ANSPs), was to make a decision as to whether to proceed with a full Feasibility Study for NEFAB. At this stage, the Feasibility Study is expected to be completed by May 2010.

KEY PRIORITY AREAS FOR THE FAB

4.8.14 The initiative is at a very early stage and as such is examining a wide range of possible improvement areas. It is expected that, as the initiative develops, the target improvement areas will be narrowed down. The initiative has currently prioritised the following areas:

- Common airspace planning;
- Common PANS OPS productions;
- Joint specification and procurement of CNS/ATM system including life cycle costs analysis and reduction;
- Common CNS network plan;
- Joint harmonised training; and
- Changes to regulatory arrangements.

SIZE OF POTENTIAL BENEFITS

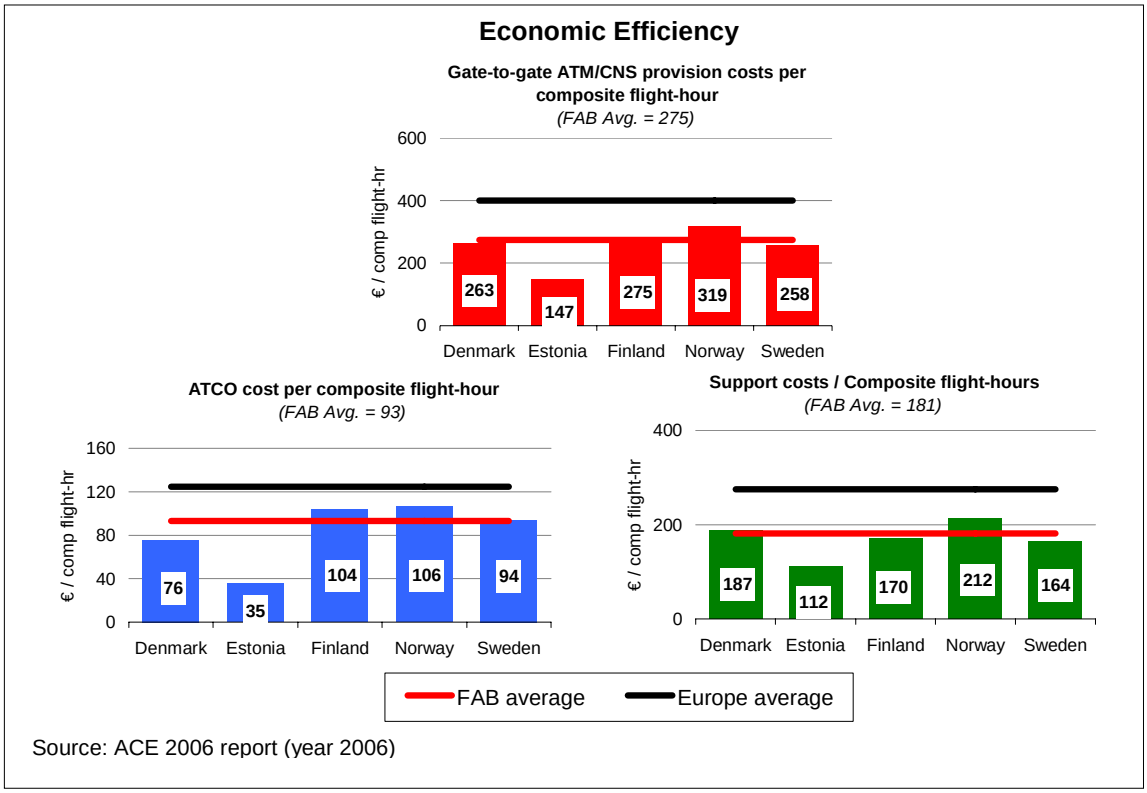
4.8.15 As in-depth work on the study has not yet been undertaken, potential benefits have not been quantified.

KEY PERFORMANCE INDICATORS

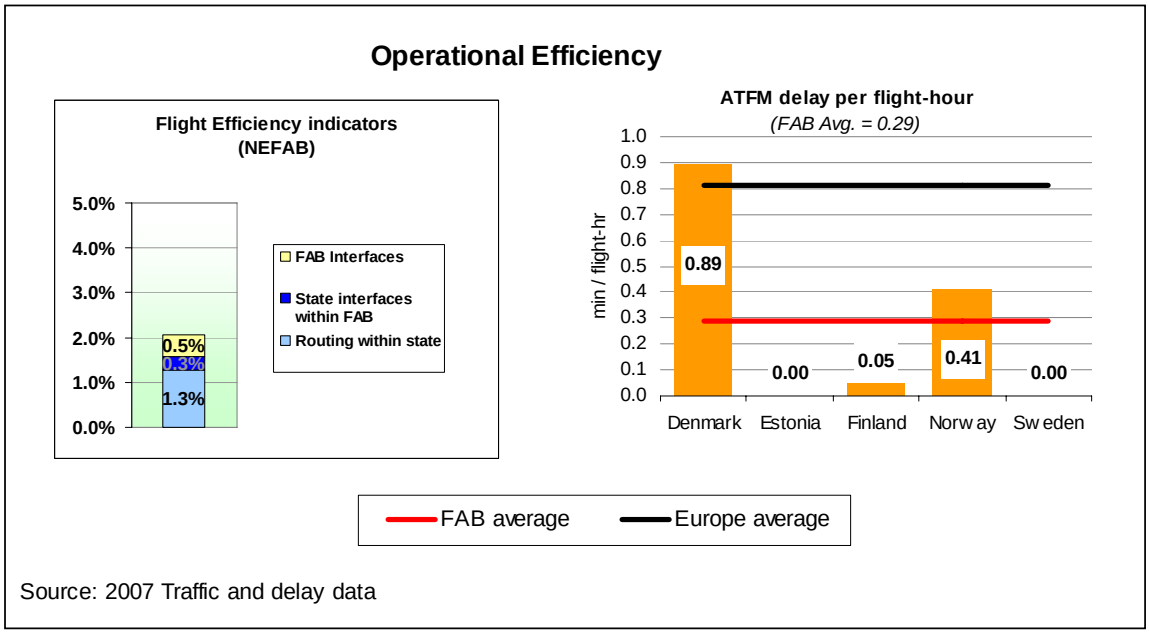
4.8.16 Figure 4-40 below shows the primary key performance indicators for cost-efficiency, operational efficiency and safety for NEFAB (no ACE data available for Isavia (Iceland)).

4.8.17 NEFAB ANSPs are relatively cost-effective compared to the European average. Significant ATFM delay in Denmark are due to a shortage of ATC capacity, this is being addressed through a new ATM system and retrofit of ACC building which was commissioned at the end of 2007.

Figure 4-40: NEFAB Key Performance Indicators



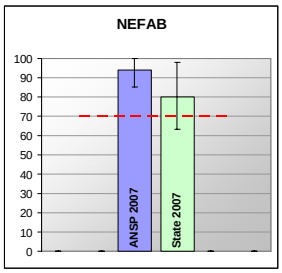
Source: ACE 2006 report (year 2006)



Source: 2007 Traffic and delay data

Safety

Safety Maturity

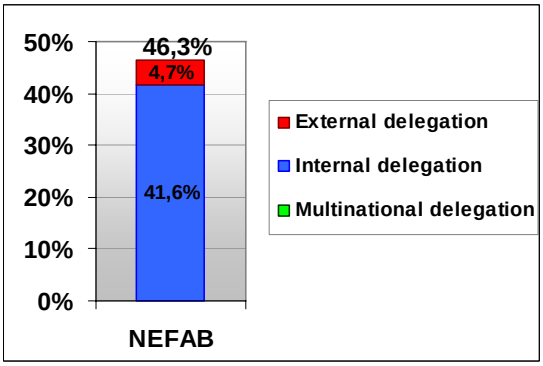


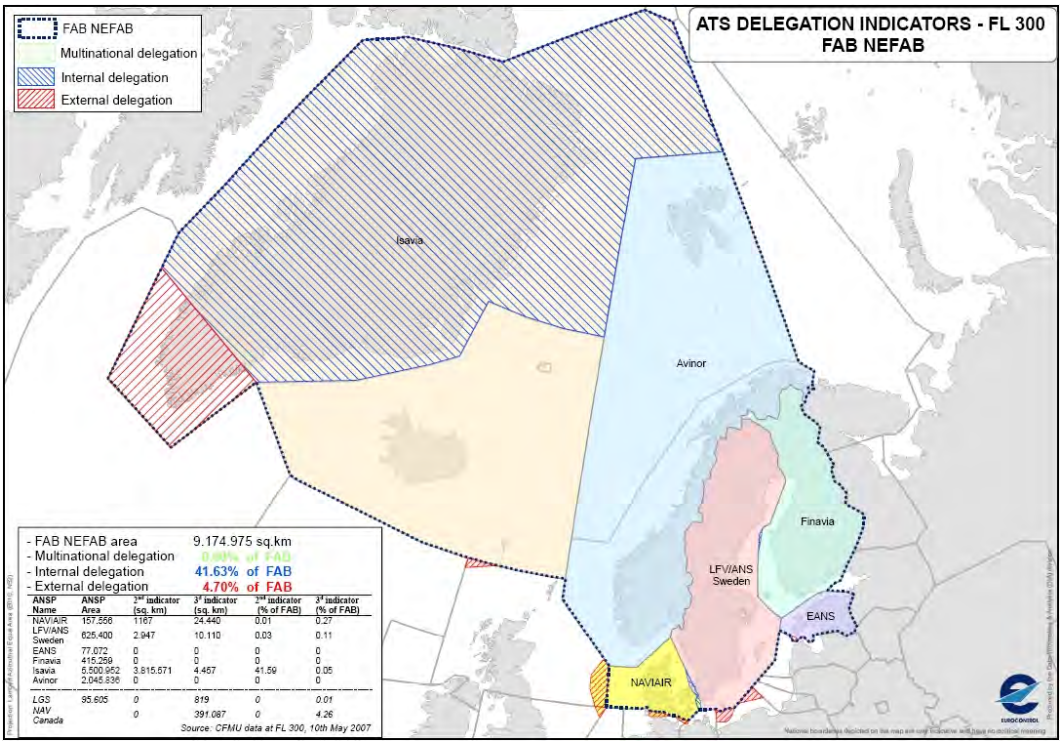
ESARR Implementation

	ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
Due fully by:	05-11-2007	01-01-2002		31-03-2008	13-07-2003		05-04-2004		11-04-2005	
State	**Reg**	**ANSP**	**Reg**	**AST sent**	**ANSP**	**Reg**	**ANSP**	**Reg**	**ANSP**	**Reg**
Denmark	Late	✓	Partial	✓	✓	Partial	✓	Partial	✓	✓
Estonia	✓	✓	✓	✓	✓	✓	✓	Partial	✓	✓
Finland	✓	✓	✓	✓	✓	✓	✓	Partial	✓	✓
Norway	Late	✓	Late	✓	✓	✓	✓	Late	✓	✓
Sweden	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Source: LCIP 2008-2012

ATS Delegation





Source: EUROCONTROL 2008

GOVERNANCE ARRANGEMENTS

4.8.18 Within NEAP, there are the following two key committees:

- North European Strategy Committee (NESC), which consists of the ANSP CEOs; and
- North European Co-ordination committee (NECC).

4.8.19 NEFAB is a WG of the NECC. The initial results of the NEFAB WG were published in NEFAB's pre-Feasibility Study report.

4.8.20 If the initiative was taken forward to a full Feasibility Study, a revised management and organisational structure would need to be put in place, but the form of this is not yet decided.

AIRSPACE USERS VIEWS[24]

4.8.21 As this is a relatively new FAB, the users have not had any involvement with the FAB to date.

STAFF VIEWS

ETF[25]

4.8.22 The ETF representatives have not had any significant involvement with the FAB to date.

PRC ASSESSMENT

4.8.23 NEFAB is in the early stages of development, it was only declared to the European Commission earlier this year following a high level pre-Feasibility Study.

4.8.24 It has the significant benefit of including a number of EU Member States and SES associate States, who at the time of the PRC's Interim Report were not included within a FAB: Iceland, Estonia, Norway and Finland. Moreover it includes a large amount of oceanic airspace (Bodø Oceanic, Reykjavik, and Sonderstrom FIRs).

4.8.25 NEFAB builds on existing co-operation agreements COOPANS, civil-military co-operation. Given the relatively low traffic density throughout the majority of the FAB, airspace optimisation is unlikely to yield significant benefits. Rather, common systems, rationalisation of services and lower duplication of support services are likely to be the main source of benefits. However, different ownership and governance arrangements across the constituent FABs may cause a difficulty with this.

4.8.26 To date the initiative has not engaged NSAs and Member States to a great extent.

4.8.27 At this stage it is too early to assess the prospects for changes and the size of the benefits introduced by NEFAB.

24 A summary of IATA views from stakeholder consultation.
25 See footnote 9

4.9 NUAC

CONTEXT AND HISTORY

4.9.1 The NUAC FAB initiative has been instigated by its Air Navigation Service Providers (ANSPs) – Luftfartsverket (LFV) in Sweden and Naviair in Denmark, as well as the respective National Supervisory Authorities (NSA) the Swedish CAA (Luftfartsstyrelsen) and CAA Denmark (SLV). The current NUAC programme is based on a former project with the same name but which was limited to upper airspace.

4.9.2 The FAB initiative was given clear political guidance on the broad objectives to be achieved by the Member States, which it perceives as being very important. However, there is no involvement by the States in the day-to-day management of the FAB initiative, and the initiative has not been provided with detailed objectives or targets by the States.

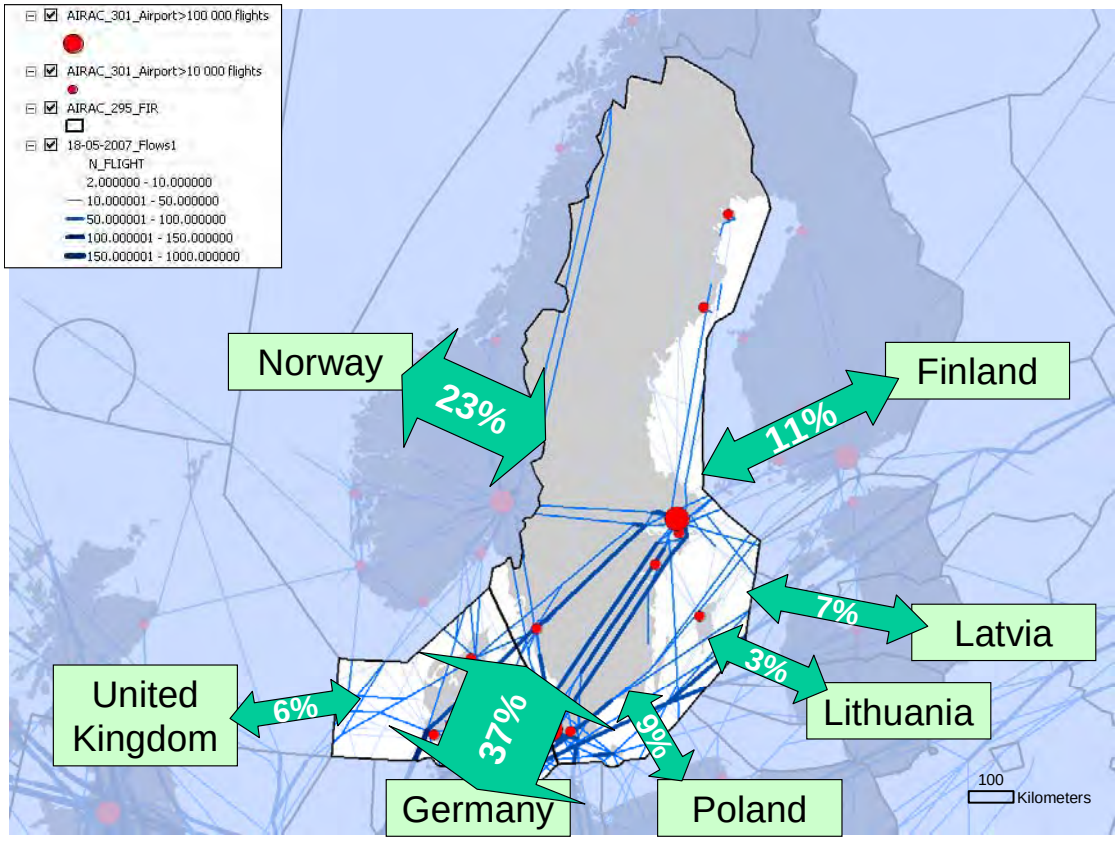
4.9.3 After examination of various options the ANSPs have decided to propose the implementation of the operational alliance model. At this stage, this is subject to agreement from the Member States.

SCOPE: AIRSPACE AND GEOGRAPHY OF THE FAB

4.9.4 The existing organisation of the airspace which forms the FAB is shown in Figure 4-41 below.

4.9.5 The main traffic flows are to the two main airports in the FAB, Copenhagen and Stockholm from the south of the FAB.

Figure 4-41: NUAC airspace region



DEVELOPMENT OF THE FAB

4.9.6 The NUAC Programme developed several scenarios for a FAB within Danish and Swedish airspace. Three were developed in the Final Definition Report (similar to the Feasibility Studies undertaken by other FABs) while the Supplementary Report supplied a fourth, as follows:

- Merger scenario;
- NUAC/SKAANE scenario;
- Alliance scenario; and
- Operational Alliance scenario (from Supplementary Report).

4.9.7 The NUAC/SKAANE scenario was not considered in the Supplementary Report, and was not being developed further, because the business case was found to be negative. However, previous work on this scenario has been used in the development of the other scenarios.

4.9.8 The ANSP CEOs have now decided to proceed with the **operational alliance** option, but this still needs to be confirmed with a final political decision by the States. The main reason the operational alliance option was selected is that it delivers the main airspace benefits of the merger, but without creating the same potential difficulties with employees and trade unions that would arise if employees had to be transferred to a new merged organisation. The NUAC Programme also considers that this option would be easier for other States to join in the future.

4.9.9 In each scenario it is foreseen the creation of a common company. The NUAC Company will be certified as the ATS provider. The parent organisations, NAVIAIR and LFV, will still own the infrastructure which will probably be leased to NUAC, and there will be some type of service level agreement. The parent organisations will be certified/designated as the ATS provider and will also provide MET and lead strategy development work.

4.9.10 It must be noted that the NUAC Company will only be certified and not designated while the parent companies will be certified and designated. They will then avail themselves of the services of the NUAC Company that has been certified in the Community according to Article 10 of the service provision Regulation.

4.9.11 There is also presently a larger FAB initiative, NEFAB, which includes Denmark and Sweden as well as Norway, Finland, Iceland and Estonia. The NUAC Company will be one of the service providers within NEFAB if this initiative proceeds. However, NEFAB would be implemented at a later stage than NUAC: at present, it is expected that NEFAB would be undertaking its feasibility assessment at around the time when NUAC started operations.

EXISTING OPERATIONAL CONCEPTS

4.9.12 The following four elements are used to provide a brief description of the existing operational concepts in each of the FAB's ANSPs:

- **En-route civil-military arrangements**: Both ANSPs provide ATC services to GAT and OAT.
- **Staff management in civil ANSPs**: Both ANSPs have individual rostering with overtime.

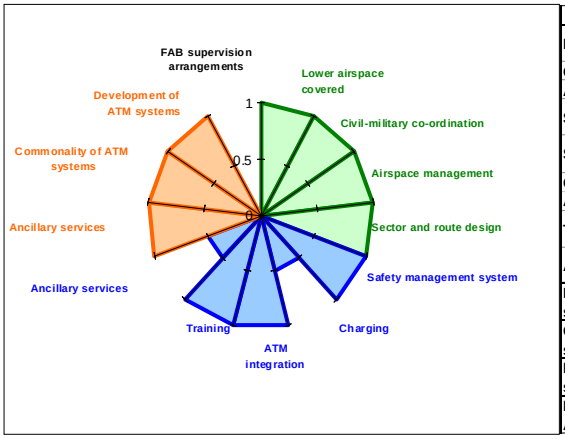
- **Characteristics of pre-tactical ATFCM/ ASM services**: NAVIAIR and LFV each have an Airspace Management Cell. NAVIAIR have 1 FMP position. LFV have an FMP for each ACC.
- **Civil ACC main functions**: NAVIAIR provides en-route, TMA and approach services through its ACC. For LFV, en-route, TMA and approach are provided by the Stockholm ACC, there is also an ACC at Malmo and several stand-alone approach units.

4.9.13 There are many similarities in the operational concepts used across NUAC as well as technology with the COOPANS initiative and training with EPN.

CHANGES PLANNED FOR THE FAB AND ARRANGEMENTS FOR THEIR INTRODUCTION

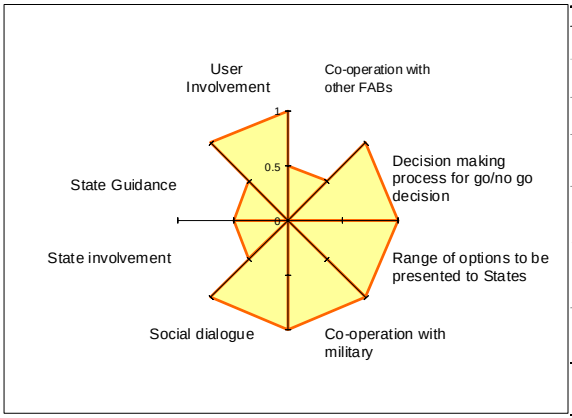
4.9.14 In Figure 4-42 and Figure 4-43 we present two frameworks for NUAC. The first describes the key changes planned to be introduced by the FAB, the second describes the arrangement for achieving these changes.

Figure 4-42: Changes planned by the FAB



Characteristic	Justification
Lower airspace covered	NUAC company to provide ATM services within lower airspace to same extent as upper airspace
Civil-Military coordination	The FAB plans level 1-3 civil-military co-ordination
Airspace management	There will be one unit for management of airspace
Sector and route design	Sector and route design will be undertaken by one integrated unit.
Safety Management System	There would be a single integrated SMS for the FAB
Charging	Possibility of uniform unit rate under consideration
ATM integration	Fully integrated service provision
Training	Entry Point North to provide joint basic training, and all other training activities to take place within NUAC
Ancillary services	AIS will be provided by the NUAC Company; MET and AIS by the parent organisations
Interoperability of ATM systems	COOPANS project and other initiatives will make systems interoperable
Commonality of ATM systems	COOPANS project and other initiatives establish common systems
Development of ATM systems	COOPANS would involve the joint development of ATM systems
FAB Supervision Arrangements	To be determined during Design and Development phase

Figure 4-43: Arrangements for introduction of the FAB

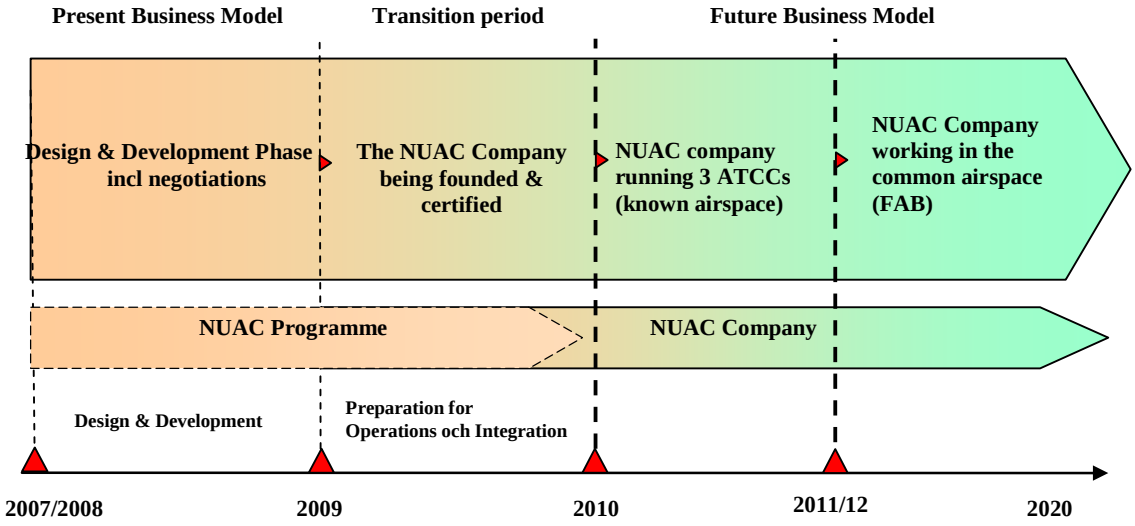


Arrangement	Justification
Co-operation with other FABs	Some co-operation with NEFAB, and FAB EC.
Decision making process for go/no go decision	Terms of reference and decision landscape give detailed description of process
Range of options to be presented to States	Three options fully developed for presentation to states, NUAC/SKAANE option development halted
Co-operation with military	Military involved in regular meetings with Coordination Groups, contributed to Definition Phase report
Social dialogue	Social partners involved in regular meetings with Coordination Groups, contributed to Definition Phase report
Involvement of States	States involved in regular meetings with Coordination Groups and contributed to Definition Phase report, but no day-to-day involvement in the initiative
Guidance from States to start and support FAB discussions	Clear political guidance was given by States, but no detailed targets or objectives were set
Involvement of users	Airspace users involved in regular meetings with Coordination Groups, contributed to Definition Phase report

TIMESCALES

4.9.15 The current timescale for the NUAC programme is summarised in Figure 4-44 below.

Figure 4-44: Timeline for NUAC[26]



KEY PRIORITY AREAS FOR THE FAB

4.9.16 In the Definition Report the initiative has identified a number of sources of potential performance improvements resulting from the introduction of the FAB:

- Cost-efficiency:
  - Cost-effectiveness;
  - Alignment of business model;
  - Strategic readiness;
  - Attraction and bargaining power; and
  - Customer orientation,
- Operational efficiency:
  - Operational flexibility;
  - Flight-efficiency;
  - Capacity improvement; and
  - Environment,
- Safety:
  - Common procedures;
  - Reduced conflict intervention; and
  - Improved interoperability,
- Political and social effects.

26 Source: NUAC Programme presentation to project team, June 2008

4.9.17 The Supplementary Report identified five further area of potential performance improvements:

- Systems;
- Resource management;
- External costs;
- Stakeholders; and
- Operations.

SIZE OF POTENTIAL BENEFITS

4.9.18 Figure 4-45 below summarises the estimated benefits from NUAC under the three organisation scenarios examined.

Figure 4-45: Estimated benefits from the NUAC initiative

	Merger	Operational alliance	Alliance
Direct impacts NPV to 2020	€172 million	**€ 84 million**	€ 69 million
Indirect impacts NPV to 2020	€ 380 million	**€ 380 million**	€371 million
Total NPV to 2020	€ 552 million	**€ 464 million**	€440 million

Source: updated CBA analysis reported by NUAC

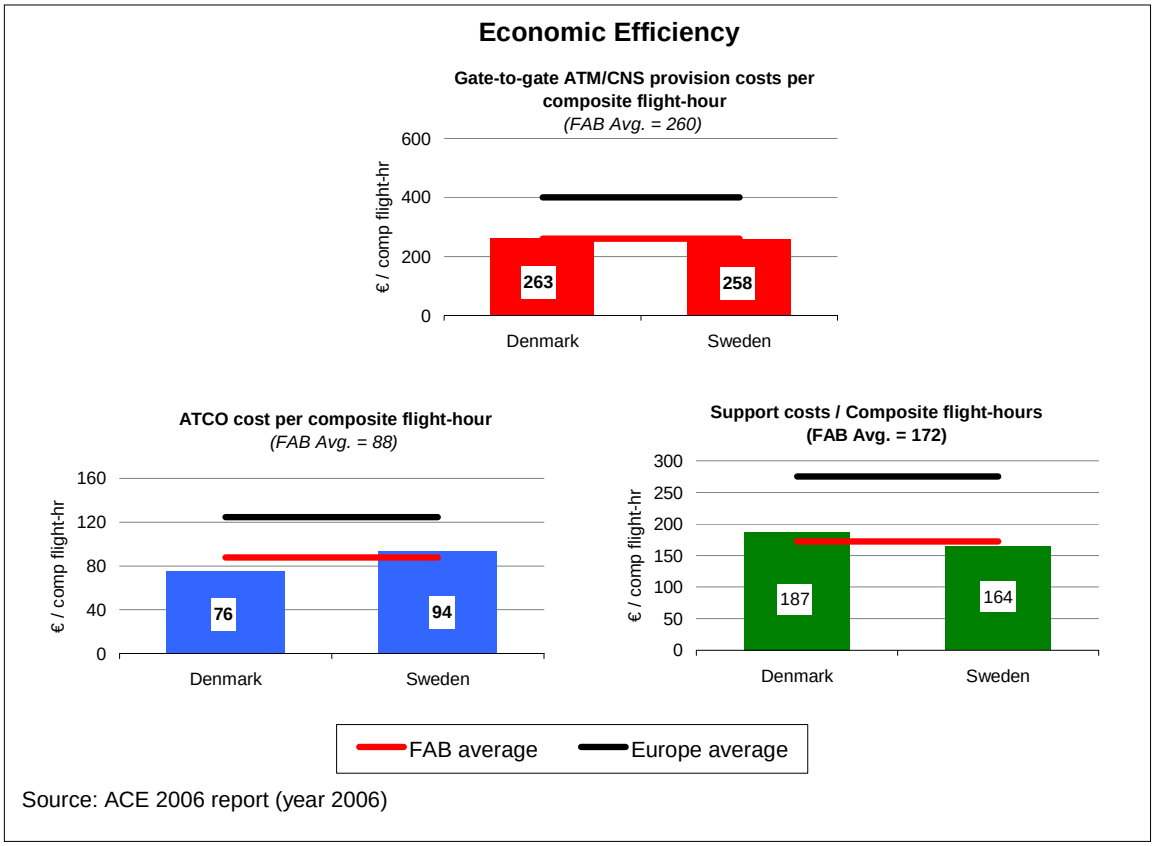
4.9.19 For the operational alliance as a proportion of 2006 Total Economic cost (€221 million for direct costs + €10 million for delay costs + €24 million for flight efficiency costs), the FAB is projected to produce net benefits of 18,4% in 2013 and 20% in 2018. 72% in 2013 and 81% of benefits are derived from flight efficiency delay and other socioeconomic benefits.

KEY PERFORMANCE INDICATORS

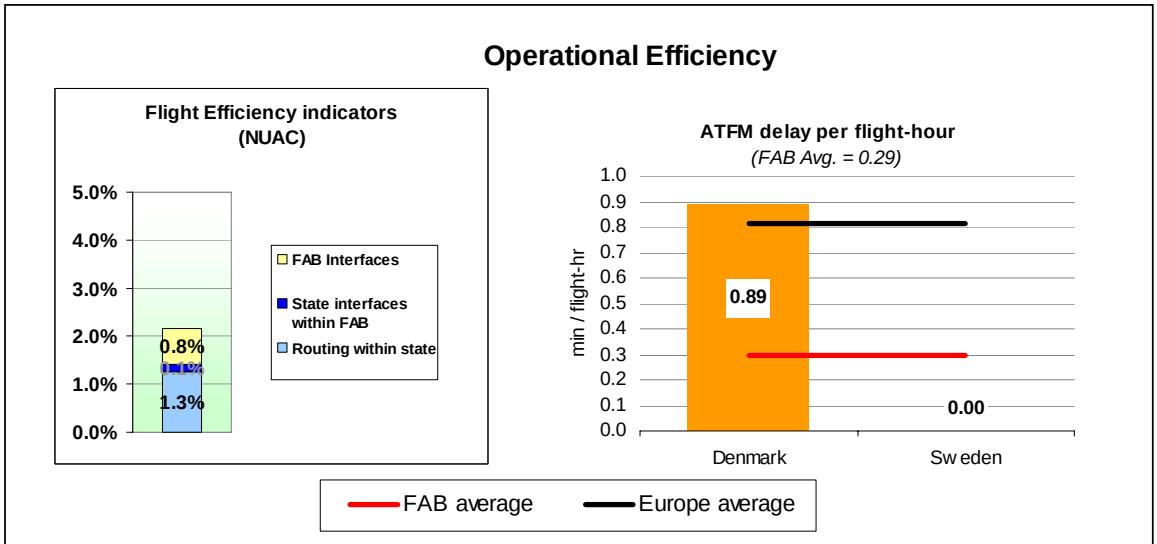
4.9.20 Figure 4-46 below shows the main key performance indicators for cost-efficiency, operational efficiency and safety for the NUAC FAB and its constituent ANSPs.

4.9.21 NUAC ANSPs are relatively cost-effective compared to the European average, with relatively low support costs. AFTM delays in Denmark in 2007 are due to a shortage of ATC capacity. However a new ATM system and retrofit of ACC building have been commissioned at end 2007. The scope for improving horizontal route extension within the FAB (1.4%) is relatively modest compared to other FAB airspaces.

Figure 4-46: NUAC Performance Indicators



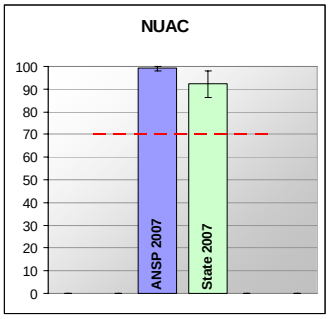
Source: ACE 2006 report (year 2006)



Source: 2007 Traffic and delay data

Safety

Safety Maturity

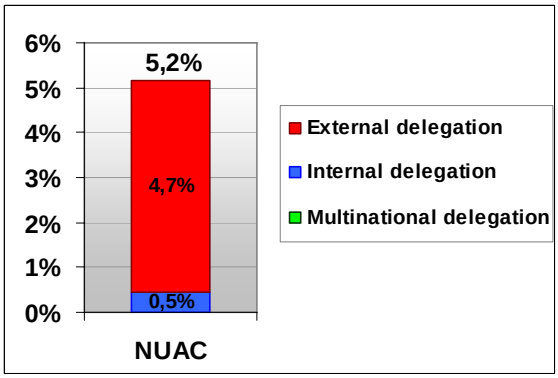


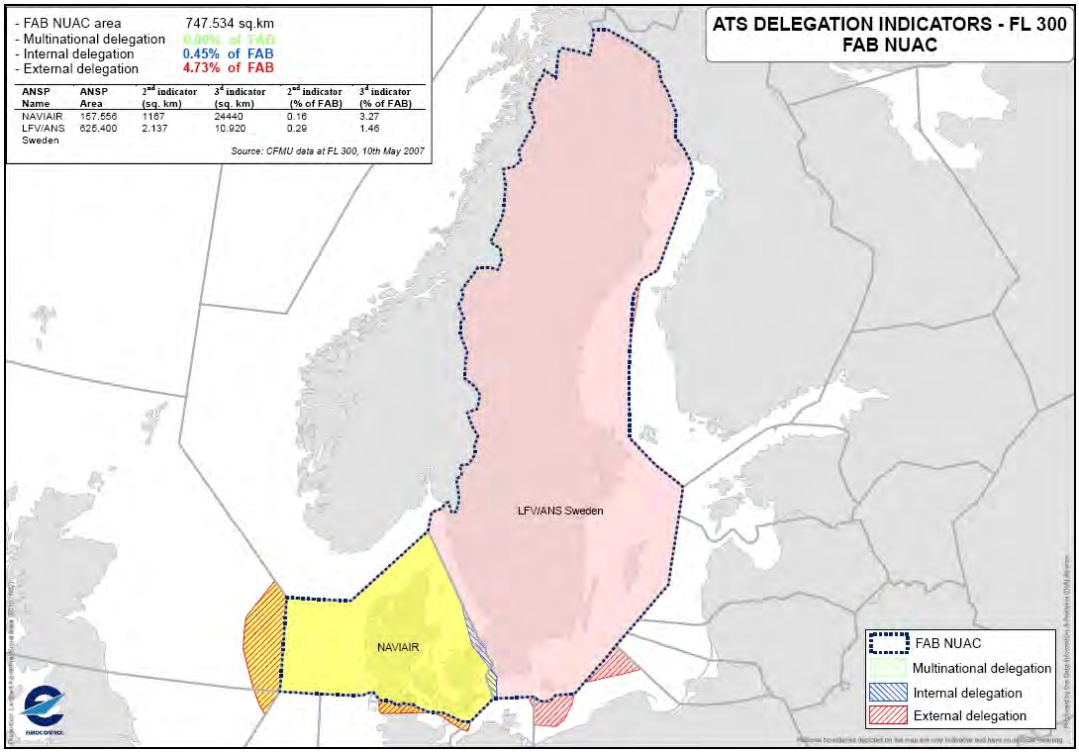
ESARR Implementation

	ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
Due fully by:	05-11-2007	01-01-2002		31-03-2008	13-07-2003		05-04-2004		11-04-2005	
State	Reg	ANSP	Reg	AST sent	ANSP	Reg	ANSP	Reg	ANSP	Reg
Denmark	Late	✓	Partial	✓	✓	Partial	✓	Partial	✓	Partial
Sweden	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Source: LCIP 2008-2012

ATS Delegation





Source: EUROCONTROL 2008

GOVERNANCE ARRANGEMENTS

4.9.22 There would be 50%/50% ownership of the NUAC Company between LFV and NAVIAIR. The NUAC Programme management has advised that the governance arrangements for the FAB would be defined in detail in the Design & Development phase of the project.

4.9.23 The Supplementary Report gives details of the proposed internal governance structure for the NUAC Company in each of the scenarios. The Company would be governed by:

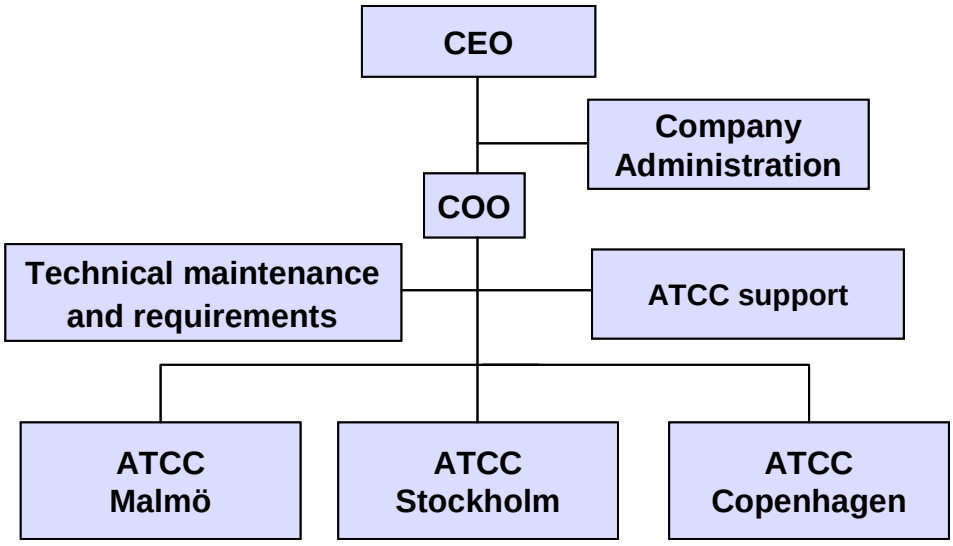
- **CEO**: Daily responsibility for overall operations and performance of the Company; chosen by and reports to the Board; inside the NUAC Company;
- **Board**: Overall responsibility for company, including operations, recruiting management, strategic direction and compliance with owners' wishes; members appointed by the General Assembly/the owners; reports to the General Assembly; inside the NUAC Company;
- **General Assembly**: Appointed by the two owners (LFS/ANS and NAVIAIR), has responsibility for picking the Board, eventual formulation of political vision for NUAC, distribution/allocation of possible surplus revenue or costs outside the NUAC Company.

4.9.24 This structure is as yet to be confirmed; in particular, it has not yet been decided whether the NUAC Company will require a General Assembly, and what role any such would have.

4.9.25 Arrangements would also need to be in place to manage the ownership of the NUAC Company. As the Company would be state-owned (the parent organisations being state-owned), a number of requirements would need to be met in order to manage ownership of shares in a financially proper way. It is also not yet clear what will be the status of the staff, whether they will be full time employees of the NUAC company or secondees from the two ANSPs.

4.9.26 The proposed organisational structure for the NUAC Company is shown in Figure 4-47 below.

Figure 4-47: Organisational structure for NUAC company



AIRSPACE USERS VIEWS[27]

4.9.27 IATA was involved with, and impressed with, the earlier work undertaken by the NUAC FAB. IATA commended the work, identifying the merger option as providing the greatest benefits of all the options under consideration.

4.9.28 However, progress has slowed down, and there is no clear reason why. The new NEFAB initiative may also have slowed down progress, as the FABs identify how these two, linked, initiatives are expected to proceed.

4.9.29 The airlines believe that the strong tradition of co-operation, the relatively good starting point of the FAB and the close working relationships with staff should provide a good basis for the future creation of the FAB.

4.9.30 The users perceived that NUAC has engaged with staff professionally (in a way not followed by other FABs), and there is potential best practice to learn from this.

STAFF VIEWS

ETF[28]

4.9.31 The involvement of staff representatives have been through a "reference group" that met once every month. The participants of the meetings were the unions and program management.

4.9.32 However, Trade Unions have had no representatives in the steering groups. ETF believes that Trade Unions involvement at working group and at management level are very important to build trust.

4.9.33 Although the social costs of change were included in the NUAC CBA, the Trade Unions were not happy about the methodology used.

PRC ASSESSMENT

4.9.34 NUAC has developed its FAB Definition Phase by building on the strong co-operation existing between LFV and Naviair, in particular the technical and training cooperation initiatives (COOPANS and EPN, respectively). The approach to airspace users and staff involvement is seen by the PRC as a model of best practice to be examined by other FABs. It was made clear from the beginning that effective engagement with staff was about sharing information on the different options being investigated and not about negotiation.

4.9.35 NUAC assessed a range of options from full organisational and operational mergers to enhanced co-operation. This shows that there is scope for further improvement. The provisional choice of the ANSPs for the operational alliance option demonstrates a pragmatic approach.

4.9.36 The project aims at creating a common Company. The NUAC Company will be certified as the ATS provider. The parent organisations, NAVIAIR and LFV, will still own the infrastructure which will probably be leased to NUAC, and there will be some type of service level agreement. The parent organisations will be certified/designated as the ATS provider and will also provide MET and lead strategy development work.

27 A summary of IATA views from stakeholder consultation.
28 See footnote 9

4.9.37 It must be noted that the NUAC Company will only be certified and not designated while the parent companies will be certified and designated. They will then avail themselves of the services of the NUAC Company that has been certified in the Community according to Article 10 of the service provision Regulation. The PRC understands that this approach has been chosen to alleviate potential legal difficulties in the creation of the FAB.

4.9.38 The similarities of the organisation in terms of operational concepts, traffic size, cost-effectiveness and mentality/ culture provide a good foundation for the creation of the FAB.

4.9.39 NUAC was provided with a clear mandate/guidance on objectives for performance improvements from States, although the objectives were not explicitly quantified. There has also been effective coordination during the different steps of the Definition Phase with the CAAs/NSAs.

4.9.40 However, limited progress seems to have been made in the first 9 months of 2008. We now understand that the ANSPs have recommended the operational alliance model, but this approach still needs to be sanctioned by the Member States.

4.9.41 Any apparent delay in decision making for the NUAC programme is related to both NAVIAIR and LFV undergoing comprehensive corporate change processes. The changes in governance arrangements mean the potential for both ANSPs to operate in a similar way to a limited Company rather than a state owned enterprise.

4.9.42 Further delay in implementation would be regrettable, as the foundation and basis for the FAB appear to have been available for some time.

4.10 SW Portugal-Spain FAB

CONTEXT AND HISTORY

4.10.1 The SW Portugal-Spain FAB initiative was instigated by its Air Navigation Service Providers (ANSPs) – NAV Portugal in Portugal and AENA in Spain.

4.10.2 To date work has been undertaken by staff from the ANSPs involved in the various working groups. Member States, NSAs, Labour unions and airspace users have been kept informed of progress, but are not actively involved at a WG level.

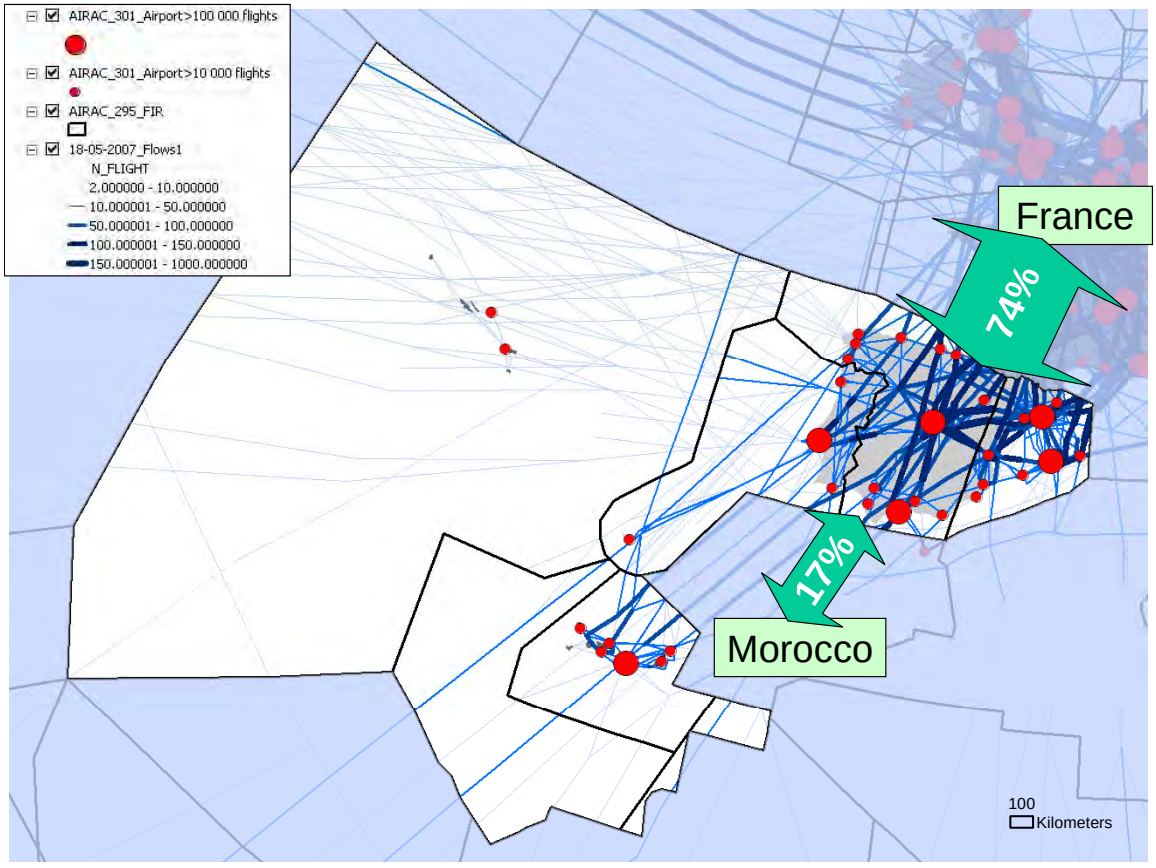
4.10.3 Discussions by both Ministry of Transports took place in January 2008 and both Portuguese and Spanish NSAs are in the process of developing agreement for the oversight of the FAB based on a draft proposal of a co-operation agreement.

SCOPE: AIRSPACE AND GEOGRAPHY OF THE FAB

4.10.4 The existing organisation of the airspace which forms the FAB is shown in Figure 4-48 below.

4.10.5 The major traffic flows are between the main airports on the mainland and to the Canaries and further to South America. Spain controls the main United Kingdom to Canaries traffic flows. A large amount of Oceanic airspace is included in the FAB through the Portuguese Santa Maria FIR. Significant flows are with Morocco which is not currently part of the FAB.

Figure 4-48: SW Portugal-Spain airspace region



DEVELOPMENT OF THE FAB

4.10.6 A letter of intent was originally agreed and signed between Aena and NAV Portugal on the 14th July 2005. However, limited progress was made at the time of a meeting with the FAB in November 2007, and the FAB was described as being "on hold".

4.10.7 NAV Portugal and Aena Spain then signed on the 29th February 2008 a **revised Letter of Intent** to set up a strengthened framework based on a number of scenarios, intending to present to the respective Member States - by the end of October 2008 - the conclusions of a FAB Feasibility Study and, should it be the case, the considered *best option*, in order to facilitate the decision making process at State level.

4.10.8 The scenarios under consideration include:

- E1: increased cooperation on CNS and other supporting services;
- E2: redesign of airspace boundaries in the Spanish-Portuguese border; and
- E3: redesign of upper airspace by studying a set of routes in order to better achieve flight efficiency.

4.10.9 All of Spanish and Portuguese controlled airspace – including the Canary Islands, and Oceanic Santa Maria FIR – are under consideration to be included in the FAB initiative. The FAB is looking at options for the FAB to include both lower and upper airspace but has not yet reached a decision.

EXISTING OPERATIONAL CONCEPTS

4.10.10 The following four elements are used to provide a brief description of the existing operational concepts in each of the FAB's ANSPs:

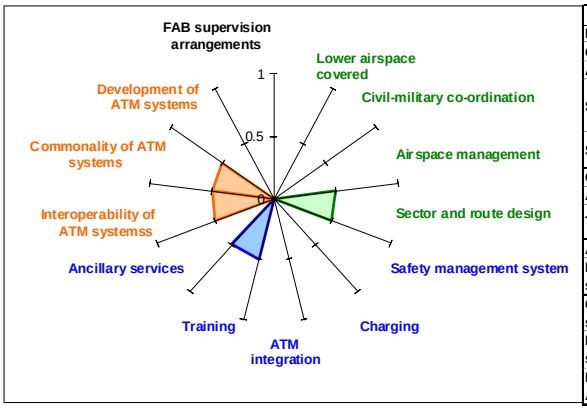
- **En-route civil-military arrangements**: both ANSPs have co-located and integrated ATC systems.
- **Staff management in civil ANSPs**: both ANSPs have team rostering with the possibility of overtime.
- **Characteristics of pre-tactical ATFCM/ ASM services**: both ANSPs each have an Airspace Management Cell. ATFM is centralised in Madrid for AENA, Nav Portugal has an FMP position for each of its two ACCs.
- **Civil ACC main functions**: Lisbon provides en-route, TMA and approach services. Santa Maria provides oceanic ATC services. There are also several stand-alone units providing approach services for NAV Portugal. AENA has some ACCs providing en-route, TMA and approach services. However, others – Palma and Valencia, provide only TMA and approach services.

4.10.11 There are many similarities in the operational concepts employed by the two ANSPs.

CHANGES PLANNED FOR THE FAB AND ARRANGEMENTS FOR THEIR INTRODUCTION

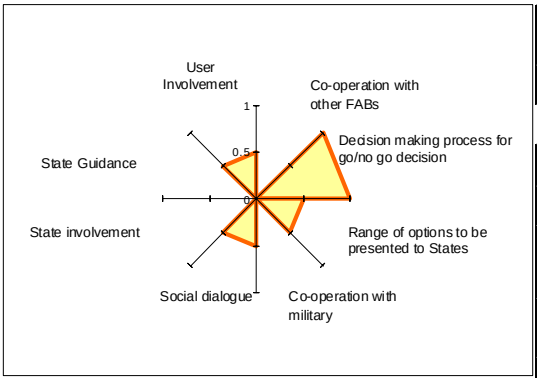
4.10.12 In Figure 4-49 and Figure 4-50 we present two frameworks for the SW Portugal-Spain FAB. The first describes the key changes planned to be introduced by the FAB, the second describes the arrangement for achieving these changes.

Figure 4-49: Changes planned by the FAB



Characteristic	Justification
Lower airspace covered	Under review, not yet concluded
Civil-Military coordination	Early stages of feasibility
Airspace management	Early stages of feasibility
Sector and route design	A task force is in place to examine opportunities for adjustment to boundaries to allow improved cross-border flows
Safety Management System	Early stages of feasibility
Charging	Not yet addressed
ATM integration	Not yet addressed
Training	FAB is considering this issue, but has not resolved its approach so far
Ancillary services	Not yet addressed
Interoperability of ATM systems	A task force is tasked with improving interoperabilty of SACTA and LISATM
Commonality of ATM systems	A task force is examining the case for a common FDP
Development of ATM systems	Not yet addressed
FAB Supervision Arrangements	In process of developing agreement based on co-operation agreement

Figure 4-50: Arrangements for introduction of the FAB



Arrangement	Justification
Co-operation with other FABs	Insufficient information received.
Decision making process for go/no go decision	Decision making based on option proposed by ANSPs and to be reviewed by the Member States
Range of options to be presented to States	One preferred option will be presented to Member States
Co-operation with military	
Social dialogue	Some involvement of ATC professional bodies and unions
Involvement of States	The evidence of involvement is minimal. There is a communication but no firm evidence that that there has been any actual involvement. A meeting is expected after October to review proposal.
Guidance from States to start and support FAB discussions	Initiative led by ANSPs and no evidence of clear guidance from States.
Involvement of users	Meetings with users on a regular basis

TIMESCALES

4.10.13 Following a period of time when the FAB was on hold, a revised letter of intent was agreed on 29 February 2008. The letter of intent provides an objective to present an option to the States by October 2008. In October 2008, both ANSPs' CEOs decided to launch a feasibility study to be carried out in 2009.

4.10.14 In this context, the Feasibility Assessment phase of the project is delayed and the project managers expect the timescales for the SW Portugal-Spain FAB programme to be:

- **Proposal and Inception**: July 2005;
- **Go/no-go decision to launch a feasibility study**: October 2008
- **Feasibility assessment and CBA**: not before the end of 2009;
- **Decision in principle by the ANSPs**: to be scheduled after States' decision;
- **Preparation for implementation** (Design & Development phase): to be scheduled after States' decision;
- **Implementation**: to be scheduled after States' decision;
- **Operations started** to be scheduled after States' decision.

KEY PRIORITY AREAS FOR THE FAB

4.10.15 The revised letter of intent, dated 29 February 2008, provides the following principle areas of co-operation:

- Development of a feasibility study based on: overall performance improvement of ANS, a common understanding and development of

optimised design in accordance with SES requirements; development of scenarios to provide medium term improvement in productivity and cost effectiveness based on current FIRs (including Canarias and Santa Maria)

- Improvement of interoperability of the SACTA and LISATM systems. Within iTEC developing and procuring an interoperable FDP system. Exploring opportunities for other system co-operation.
- Analysis of collaboration in air navigation equipment calibration (potential a common company providing this service to both organisations.
- Potential for NAV to join AENA in the SESAR JU contribution and participation.
- Analysis of joint Research and Development requirements and opportunities in the medium term.
- Analysis of the common use of training processes and facilities.

SIZE OF POTENTIAL BENEFITS

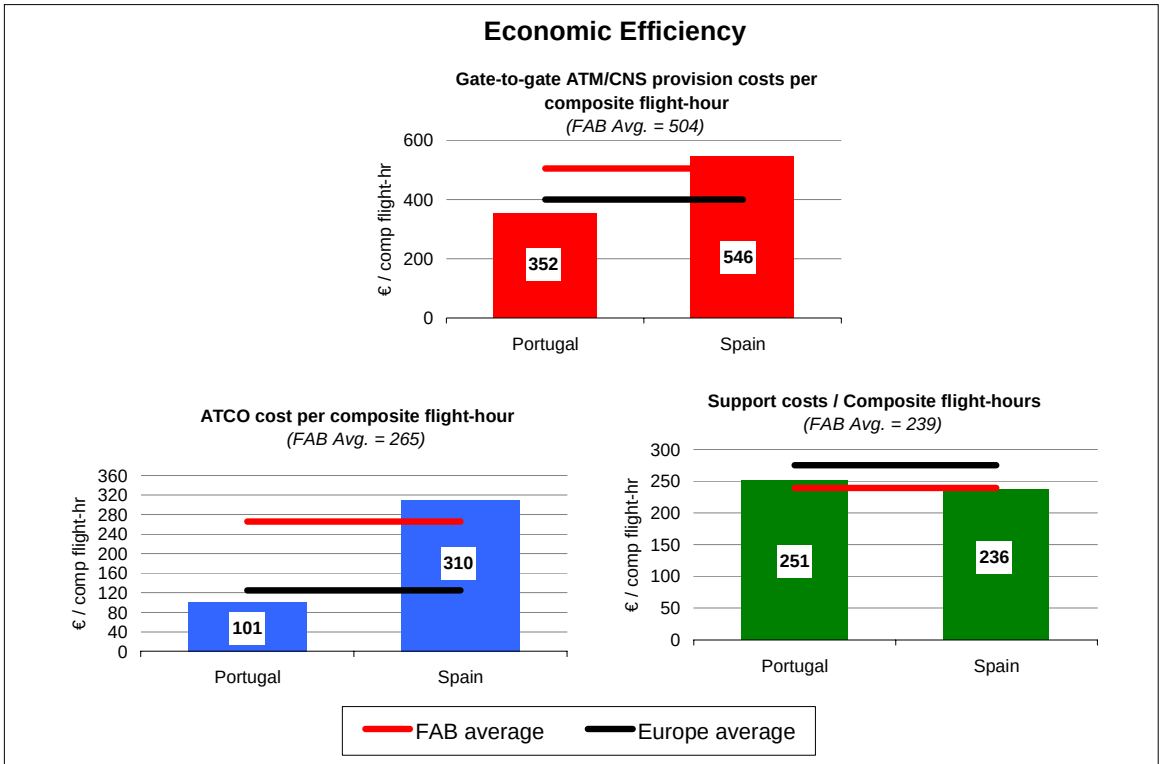
4.10.16 As in-depth work on the study has not yet been undertaken, potential benefits have not been quantified.

KEY PERFORMANCE INDICATORS

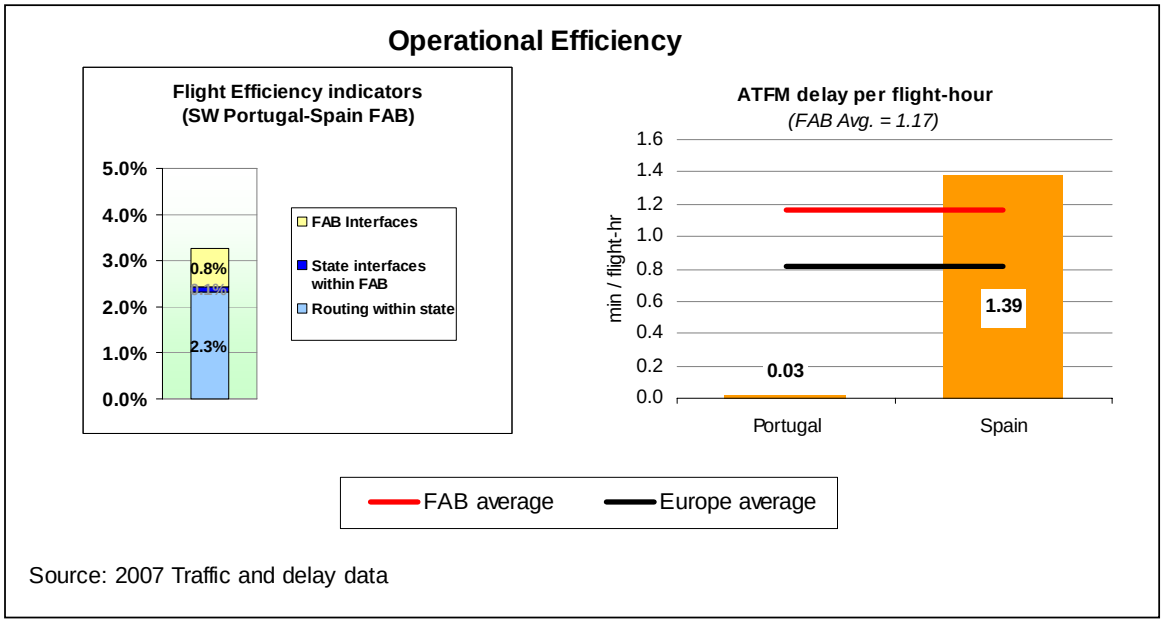
4.10.17 Figure 4-51 below shows the main key performance indicators for cost-efficiency, operational efficiency and safety for the SW Portugal-Spain FAB and its constituent ANSPs.

4.10.18 The relatively high unit costs of the FAB are driven by high employment costs of AENA. There is high ATFM delay in Spain. The main opportunity for improving horizontal route extension lies within the States.

Figure 4-51: SW Portugal-Spain Key Performance Indicators



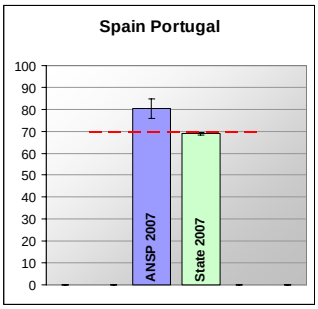
Source: ACE 2006 report (year 2006)



Source: 2007 Traffic and delay data

Safety

Safety Maturity

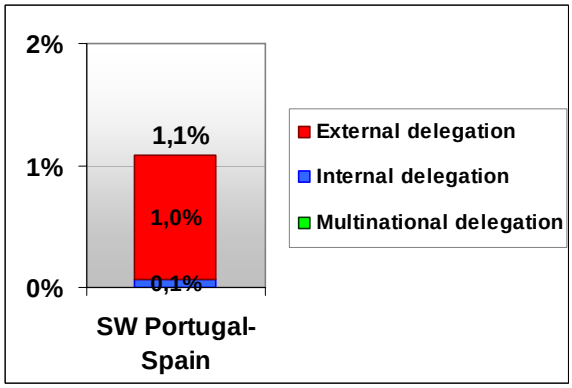


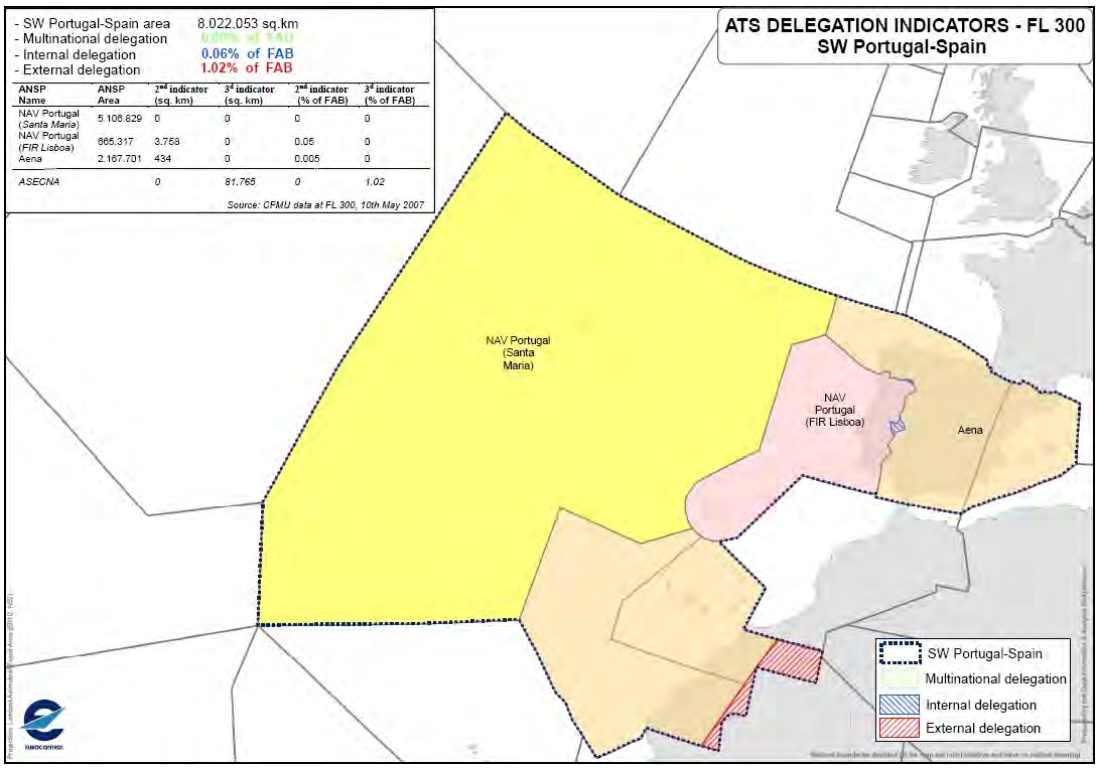
ESARR Implementation

	ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
Due fully by:	05-11-2007	01-01-2002		31-03-2008	13-07-2003		05-04-2004		11-04-2005	
State	Reg	ANSP	Reg	AST sent	ANSP	Reg	ANSP	Reg	ANSP	Reg
Portugal	✓	✓	✓	✓	✓	Partial	✓	Partial	✓	Late
Spain	✓	✓	✓	✓	✓	✓	✓	✓	✓	Late

Source: LCIP 2008-2012 except for Spain following comments received during Draft Final Report consultation

ATS Delegation





Source: EUROCONTROL 2008

GOVERNANCE ARRANGEMENTS

4.10.19 As outlined in the minutes of the Steering Group, the governance arrangements for the FAB following the February revision of the letter of intent comprise:

- Steering Committee: with representatives of senior management from each ANSP;
- Task Forces: composed of technical experts and organised to address specific issues arising:
  - Operational task force: to study adjustments to collateral FIR boundaries according to cross-border flows where operational gains justify it;
  - System task force: interoperability of SACTA and LISATM, systems, development and procurement of an interoperable FDP system;
  - Flight calibration activities task force: study collaboration and consolidation of flight calibration activities;
  - Procurement task force: analyse the potential gains of joint procurement of CNS equipment;
  - SESAR activities task force: investigate and consider joint contribution on planned activities (SESAR JU);
  - Training task force: study common use of ATS and technical staff training processes and facilities.

AIRSPACE USERS VIEWS[29]

4.10.20 Users have not yet been involved with the development of the SW Portugal-Spain FAB and perceive with dissatisfaction that there is a lack of political drive at States level and no progress has been made at ANSPs level.

STAFF VIEWS

ATCEUC[30]

4.10.21 There has been some involvement of ATC professional bodies and unions, however they lack the information and transparency to fully understand the development of the project.

ETF[31]

4.10.22 There has been some involvement of ETF representatives in the development of SW Portugal-Spain FAB. The FAB management describes that ATC professional bodies and unions are participating in working groups and regular meetings are held.

PRC ASSESSMENT

4.10.23 There has been very limited progress in the development of the SW Portugal-Spain FAB during the course of this study. There appears to be a lack of commitment, or clear guidance on objectives for performance improvements from Member States, and a lack of agreement from within the ANSPs as to how to progress to the feasibility stage of the assessment. The latest information

29 A summary of IATA views from stakeholder consultation.
30 See footnote 8
31 See footnote 9

indicates that both ANSPs have decided to launch a feasibility study; a preferred option for a go/no-go decision from States will be presented in October 2008.

4.10.24 The differences in size between AENA and NAV provide a potential obstacle to the further progress of the FAB. The location of the States to the South West of Europe and the high level of ATCO employment costs in Spain provide potential obstacles to producing significant benefits from the creation of the FAB in the region.

4.10.25 The geographic location of Portugal and Spain at the edge of Europe mean they are natural partners for a FAB. However, significant traffic flows with Morocco indicate there may be significant potential benefits from including them within the FAB.

4.10.26 The list of areas for investigation includes adjustments to cross border flows, training, R&D and systems. It is currently unclear what the size of the potential benefits from these changes is.

4.10.27 The PRC can find no basis for optimism that this FAB will be implemented in the near future.

4.11 United Kingdom- Ireland FAB

CONTEXT AND HISTORY

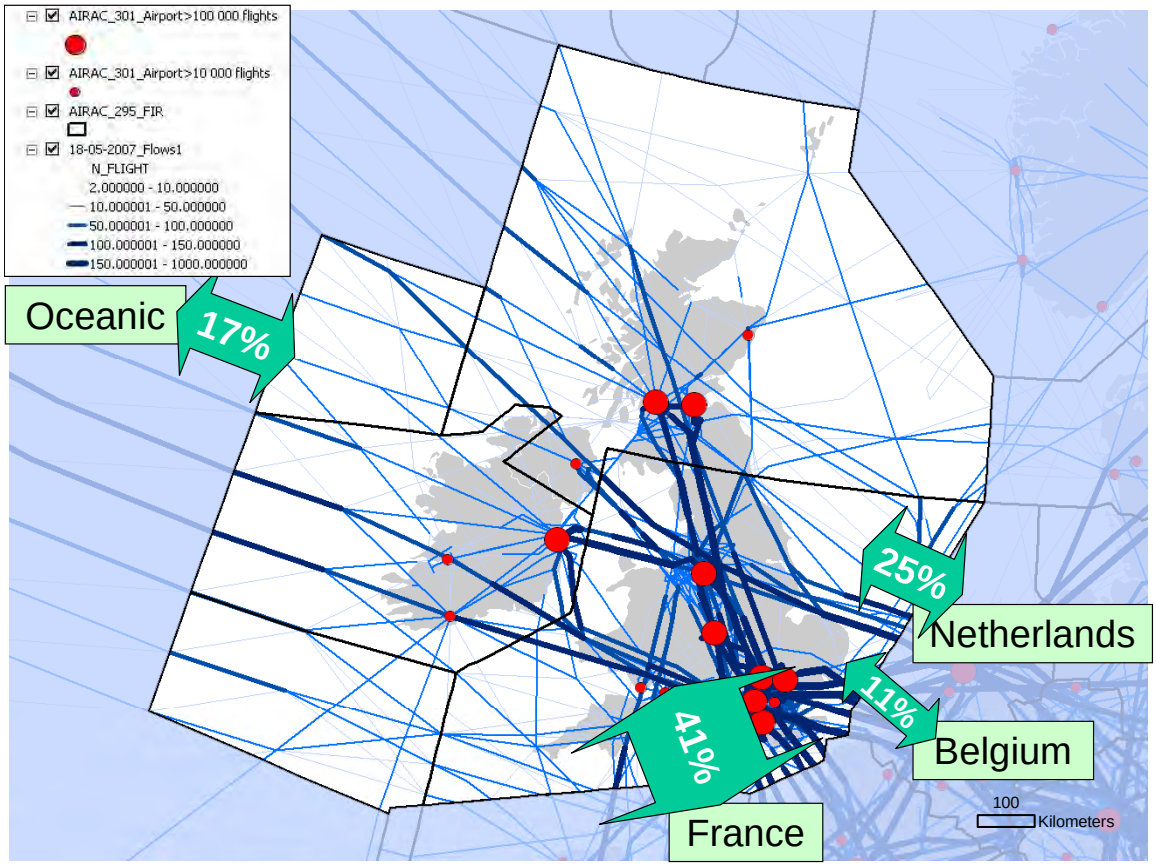
4.11.1 The UK-Ireland FAB initiative has been developed by its Air Navigation Service Providers (ANSPs) – NATS and the Irish Aviation Authority (IAA), as well as its respective National Supervisory Authorities (NSA) the UK CAA – through the Directorate of Airspace Policy, Safety Regulation Group and Legal Directorate - and the Safety Regulation Division of IAA in Ireland. Representatives of both Departments of Transport of the Member States have played a key role in shaping the FAB initiative.

SCOPE: AIRSPACE AND GEOGRAPHY OF THE FAB

4.11.2 The existing organisation of the airspace which forms the FAB is shown in Figure 4-52 below.

4.11.3 Significant traffic flows link the main airports serving the London basin to the European mainland. North Atlantic flows travel over Scotland to the north. The major London flows are close to FAB EC airspace. There are also significant oceanic traffic flows.

Figure 4-52: UK and Ireland airspace region



DEVELOPMENT OF THE FAB

4.11.4 The Helios initial Feasibility Study in 2005, and further developed by the ANSPs, examined a number of options for the application of a FAB to the controlled airspace of the IAA and NATS. It recommended an option for the FAB which would cover both upper and lower airspace including:

- the London, Scottish and Shannon Flight Information Regions (FIRs); and

- the Northern Oceanic Transition Area (NOTA) and Shannon Oceanic Transition Area (SOTA) parts of the Shanwick Oceanic Control Area which is delegated jointly to the UK and Ireland by the ICAO[32].

4.11.5 The initial Feasibility Study was followed by extensive work on action plans, and detailed examination of business integration options. However, after consideration by the respective Governments, it was decided in late 2007 that the UK-Ireland FAB should be operationally driven using an approach of "Design & Build through Partnership with Airlines".

4.11.6 Under this approach a FAB Management Board has been established and tasked with identifying changes, through defined business cases, to:

- airspace design and management;
- service provision; and
- safety.

EXISTING OPERATIONAL CONCEPTS

4.11.7 The following four elements are used to provide a brief description of the existing operational concepts in each of the FAB's ANSPs:

- **En-route civil-military arrangements**: Civil-Military co-ordination in Ireland is governed by FUA and co-ordinated by letter agreements. In the UK, there is co-location of Civil-military between RAF and NATS, but remote location of centres for the RAN, with a partially integrated ATC system.
- **Staff management in civil ANSPs**: Both ANSPs have team rostering with overtime available at IAA and NATS.
- **Characteristics of pre-tactical ATFCM/ ASM services**: Ireland has one FMP but no AMC. The AMC function is performed by the Station Manager of the relevant ACC. The UK has 1 ASM unit and 2 FMPs units with partial integration between the two.
- **Civil ACC main functions**: The IAA has two ACCs providing en-route and TMA services. Radar stand-alone services are used for approach. NATS is moving towards two ACCs (Swanwick and Prestwick) responsible for en-route, TMA and approach. NATS has an additional ACC for Oceanic traffic (Shanwick).

4.11.8 There is a long history of co-operation between the two ANSPs and there are many similarities in the operational concepts employed by the two ANSPs.

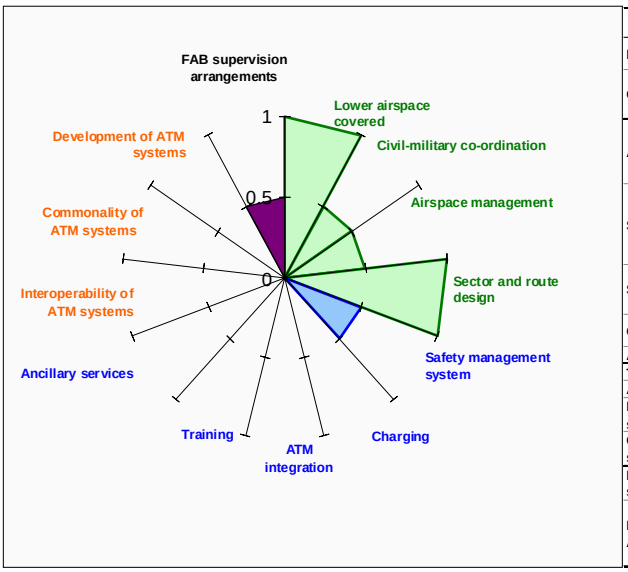
CHANGES PLANNED FOR THE FAB AND ARRANGEMENTS FOR THEIR INTRODUCTION

4.11.9 In Figure 4-53 and Figure 4-54 we present two frameworks for the UK-Ireland FAB. The first describes the key changes planned to be introduced by the FAB, the second describes the arrangement for achieving these changes. These are based on the changes introduced by the FAB, or planned by the FAB. FAB UK-Ireland although established in early July 2008, is still developing its business cases for introducing the specified changes to its operations resulting from the FAB. It should be noted that there is already a significant effective level of

32 Please note that although NOTA and SOTA lie outside the scope of the SES legislation, it is the UK-Ireland FAB's intention that they will form a part of the FAB's airspace. This was communicated to the European Commission within the joint UK and Ireland State presentation to the Single Sky Committee in 21 May 2008.

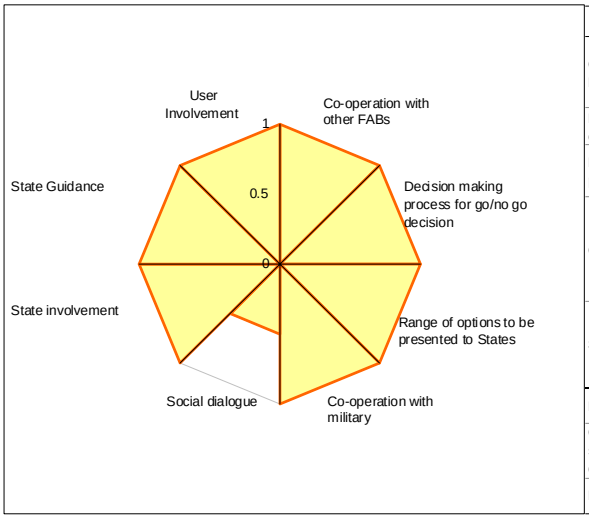
baseline co-operation between the ANSPs in a number of areas which are not applied to this framework.

Figure 4-53 : Changes planned by the FAB



Characteristic	Justification
Lower airspace covered	Lower airspace will be covered by the proposed FAB.
Civil-Military coordination	The Management Board will include two co-opted Military representatives. It is a key objective to extend co-operation on FUA.
Airspace management	Through the service provision working group there are plans to develop a fully co-ordinated and consolidated network management function for the FAB.
Sector and route design	FAB management board have prioritised airspace design with a short term objective to integrate operation of Dublin, Belfast and Manchester and to create extra co-ordination points to allow for parallel routings
Safety Management System	The FAB establishes a safety management working group. It has plans for developing an integrated safety management system.
Charging	The initial focus of the FAB Management Board will exclude charging considerations.
ATM integration	FAB does not cover this characteristic
Training	FAB does not cover this characteristic
Ancillary services	FAB does not cover this characteristic
Interoperability of ATM systems	There are no plans for enhanced interoperability as part of the FAB.
Commonality of ATM systems	There are no plans for enhanced commonality as part of the FAB.
Development of ATM systems	Both ANSPs would continue to develop their own systems.
FAB Supervision Arrangements	A Supervisory Committee will be established to oversee the FAB management board operations. However, ultimate sanction will remain with the two NSAs

Figure 4-54: Arrangements for introduction of the FAB



Arrangement	Justification
Co-operation with other FABs	NATS is a co-operative partner of FAB EC and is in discussions about a more formal membership of the FAB, and IAA is a member of the NEAP, which is progressing the NEFAB initiative
Decision making process for go/no go decision	Documents were presented to the Government , and a clear decision to proceed was given.
Range of options to be presented to States	Four options for airspace design presented in Feasibilty Study, then a further option for institutional structure was developed.
Co-operation with military	The Military have been involved with the development of the FAB during the feasibility study. Representatives of the Irish Air Corps and Royal Air Force have been appointed to the FAB management board and will be involved with creating initiative business cases.
Social dialogue	Effective process has been established for ensuring trade union views are heard. The FAB is in discussions with representatives of the trade unions to see how best they can be involved in the working groups of the FAB management board.
Involvement of States	Full involvement of Member States in examining options and the selection of the preferred option.
Guidance from States to start and support FAB discussions	Clear and appropriate political guidance given by both governments.
Involvement of users	Users to chair the service provision working group and are represented on the FAB management board

TIMESCALES

4.11.10 Key dates were:

- 1 June 2005, publication of Feasibility Study;
- 24 October 2007, meeting with Member States to determine when and how the programme is taken forwards;
- Christmas 2007, submission of revised proposal to Member States;
- Early 2008, decision to go ahead with revised proposal, Member State approval process;
- 21 May 2008, presentation to Single Sky Committee;
- 12 June signing of inter-State, NSA and ANSP Memoranda of Understanding;

- 13 June 2008 notification of the FAB joint designation by UK and Irish Member States and joint Member State announcement of the FAB at the Transport Council;
- 30 June 2008, First meeting of FAB Management Board;
- 14 July 2008, start date of UK Ireland FAB;
- 6 August 2008, first meeting of FAB Supervisory Committee.

KEY PRIORITY AREAS FOR THE FAB

4.11.11 The "Design & Build" FAB is focussed on delivering practical solutions to problems or constraints emerging. The UK-Ireland FAB has identified seven key focus areas, with key target dates, to develop for implementation over 2008-2010:

- **Safety**: To develop an integrated SMS for the FAB including publication of a strategic plan for safety with performance reporting against safety metrics by 2009.
- **Performance management and reporting**: To prepare an annual FAB plan by 2008; develop and implement integrated performance management reporting and customer consultation process by 2009; and prepare an annual report outlining performance against plan by 2010.
- **Environment**: To develop a plan to allow aircraft at the higher levels transiting Oceanic UK – Ireland airspace into the FAB EC airspace or NEAP airspace to operate in a more environmentally effective way by utilising routes tailored to optimal tracks by 2010.
- **Airspace design optimisation**: To provide a plan for the integrated operation of the Dublin, Belfast and Manchester terminal airspaces and their ACC interfaces by 2009; and create extra co-ordination points at current airspace boundaries to allow parallel routing operations by 2010.
- **Oceanic transition**: To develop a customer optimised airspace and sectorization plan for the efficient integration of oceanic and domestic traffic to accommodate the significantly increased demand expected on the North Atlantic by 2009.
- **Airspace management optimisation & Civil/Military co-operation**: To develop a plan for improved system and procedural support to allow for the optimisation of available route structures and more flexible use of the entire airspace by 2010.
- **Capacity/ Service delivery**: To develop and implement a fully co-ordinated network management function for the FAB which will improve services for customers utilising CDM tools by 2010.
- **Interface with other FABs**: At the first meeting of the FAB Management Board it agreed to add another near term objective to focus on effective co-operation with other FABs.

4.11.12 However, ANSPs and States did not agree on quantified key performance targets.

SIZE OF POTENTIAL BENEFITS

4.11.13 The size of the potential benefit was quantified during the Feasibility Study, and adapted during the development of the "Design & Build" FAB. In the period to 2013, the FAB estimates benefits of €12 million per annum:

- €8 million coming from delay reductions;
- €3 million from fuel savings; and
- €1 million from CO_2 savings.

4.11.14 This represents a modest size of benefits compared to the total gate to gate costs of the FAB. The FAB has not yet identified the quick wins, but these should emerge during the early work of the FAB Management Board.

4.11.15 In the longer run they expect annual benefits by 2018 to be in the region of €40 million per annum (€15m from delay reductions, €10m from a combination of fuel and CO_2 savings, €7m from CNS/ATM savings and €8m from sector savings), this is summarised in Figure 4-55 below. A detailed description of the CBA is provided in Chapter 6 of this report.

Figure 4-55: Estimated benefits from the UK-Ireland FAB initiative

Category	Benefits p.a. by 2013 (€ millions)	Benefits p.a. by 2018 (€ millions)
Delay reductions	8	15
Fuel savings	3	10
CO_2 savings	1	-[1]
CNS/ATM savings	-	7
Sector savings	-	8
TOTAL	**12**	**40**

[1]: The CO_2 savings are included in the fuel savings and delay reductions values

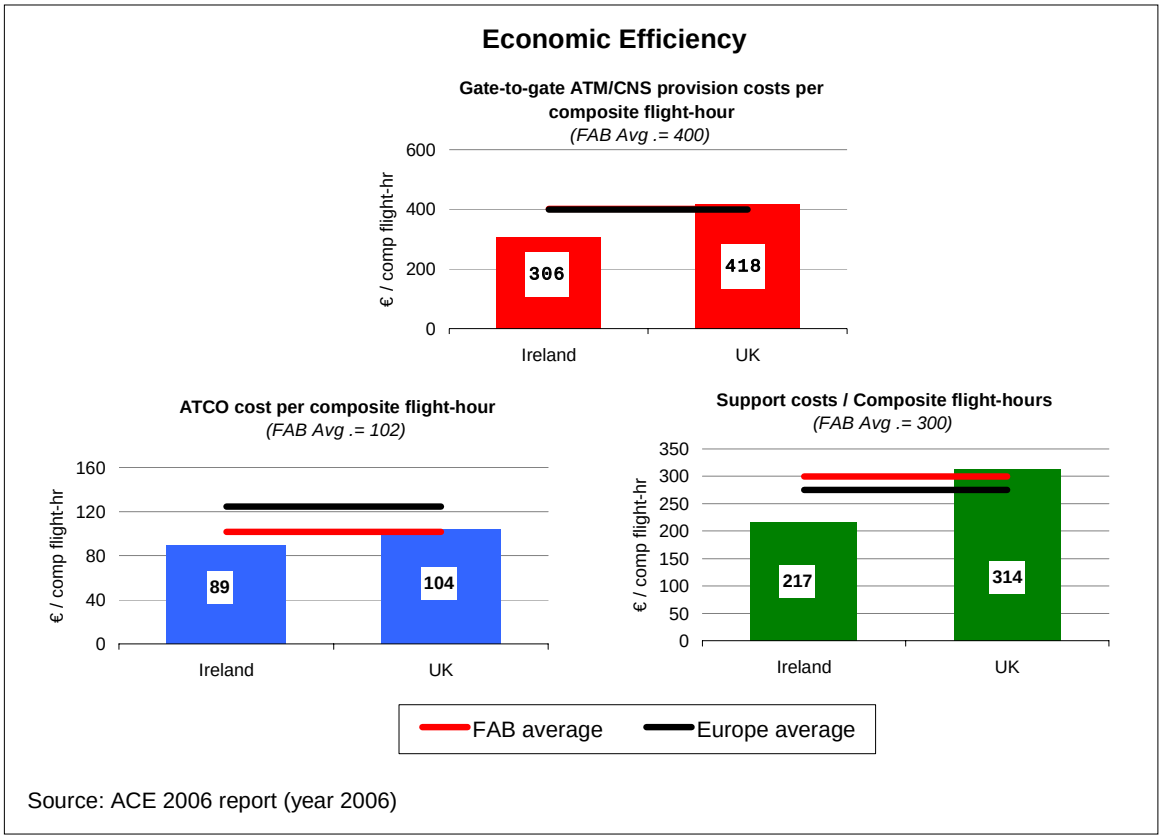
4.11.16 As a proportion of 2006 Total Economic cost (€895 million for direct costs + €94 million for delay costs + €146 million for flight efficiency costs), the FAB is projected to produce net benefits of 1.1% in 2013 and 3.5% in 2018. Flight efficiency and delay improvement provide 100% of the benefits in 2013 and 63% in 2018.

KEY PERFORMANCE INDICATORS

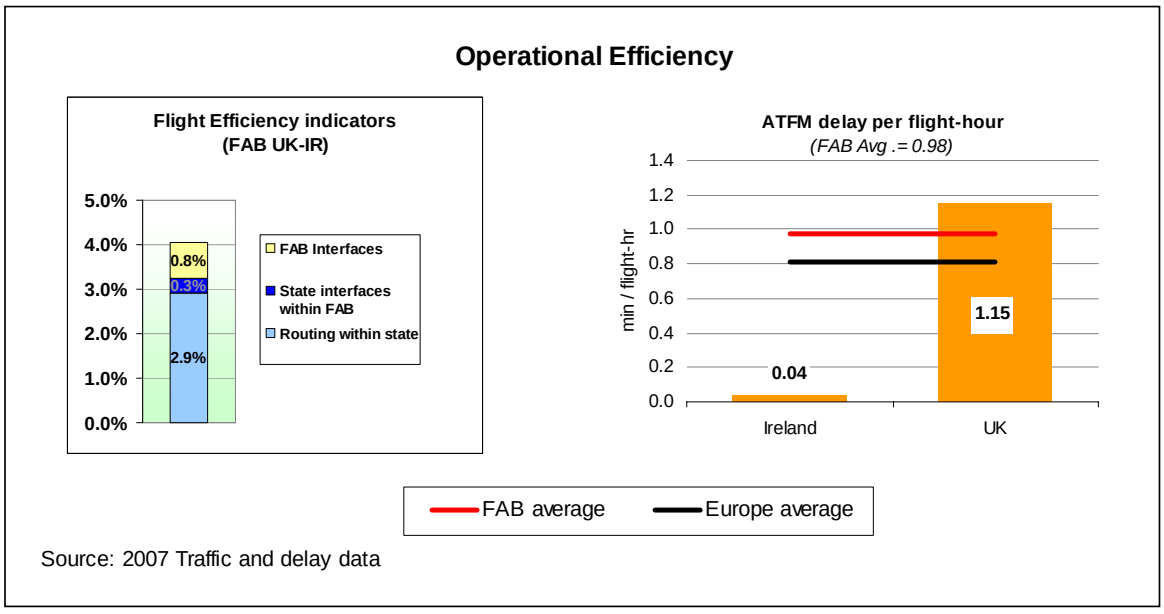
4.11.17 Figure 4-56 below shows the main key performance indicators for cost-efficiency, operational efficiency and safety for the UK-Ireland FAB and its constituent ANSPs.

4.11.18 NATS has relatively high support costs and the UK experiences high en-route ATFM delay. There appears to be still significant scope for improvements in the horizontal route extension within the FAB.

Figure 4-56: UK-Ireland Key Performance Indicators



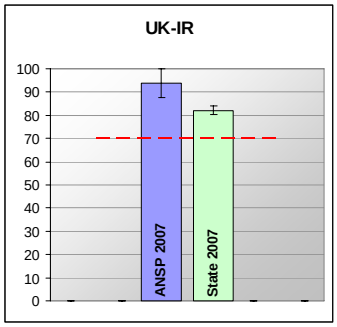
Source: ACE 2006 report (year 2006)



Source: 2007 Traffic and delay data

Safety

Safety Maturity

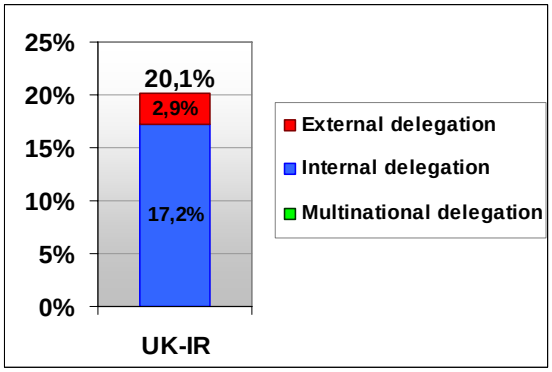


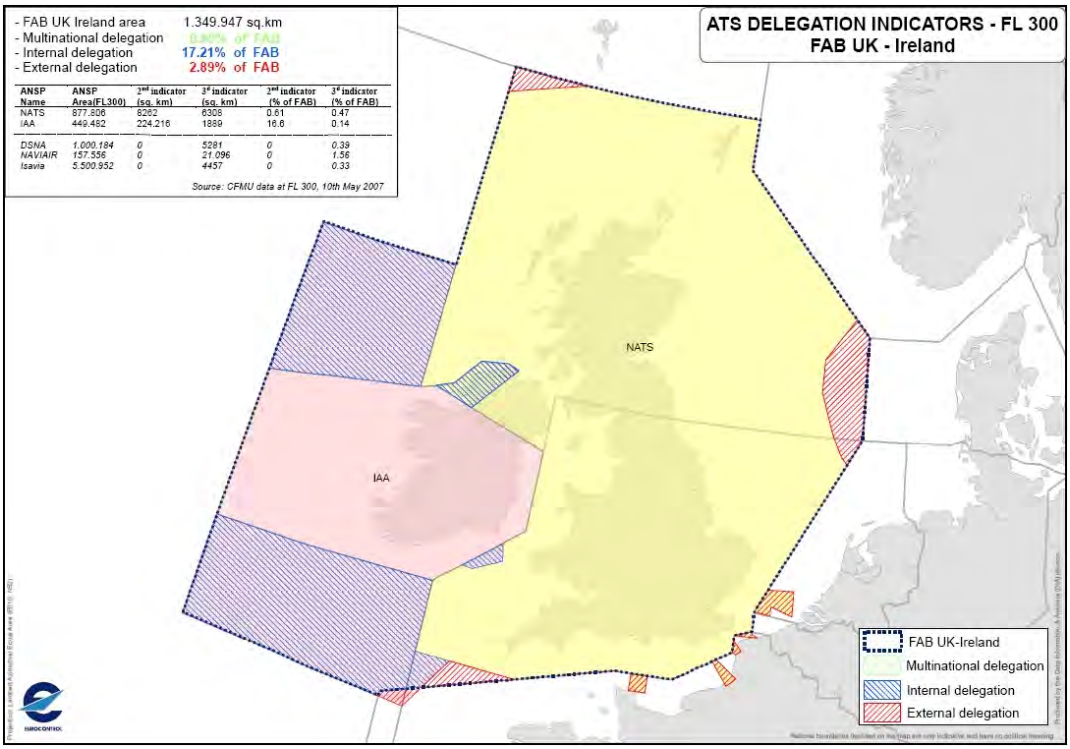
ESARR Implementation

	ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
Due fully by:	05-11-2007	01-01-2002		31-03-2008	13-07-2003		05-04-2004		11-04-2005	
State	Reg	ANSP	Reg	AST sent	ANSP	Reg	ANSP	Reg	ANSP	Reg
Ireland	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UK	Partial	✓	✓	✓	✓	Partial	✓	under rev	✓	✓

Source: LCIP 2008-2012

ATS Delegation





Source: EUROCONTROL 2008

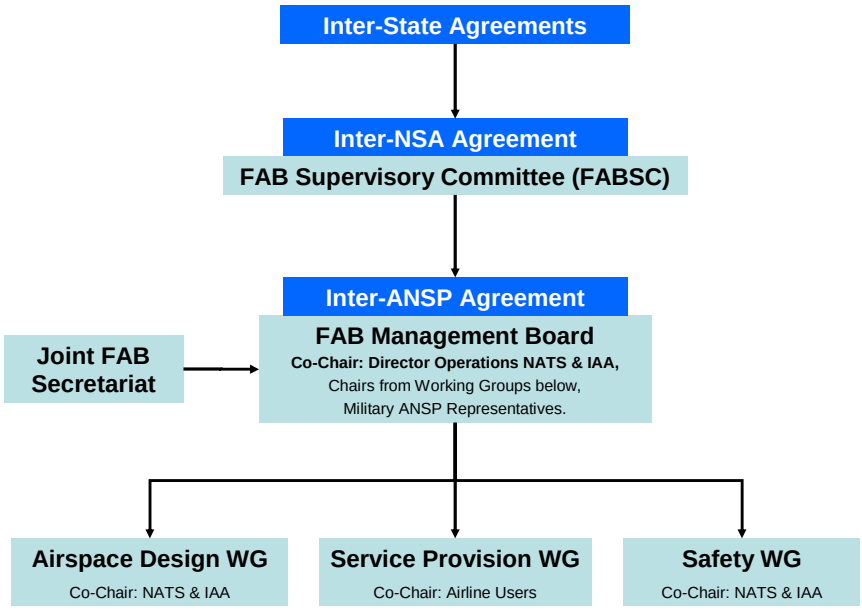
GOVERNANCE ARRANGEMENTS

4.11.19 Figure 4-57 illustrates the UK-Ireland FAB's governance structure for the implementation of the FAB Management Board.

4.11.20 The Governance arrangements are set out in three Memoranda of Understanding (MoUs) between the respective States, NSAs and the ANSPs.

4.11.21 At NSA level a FAB Supervisory Committee has been established to organise the implementation of the inter-NSA agreement. The expectation is that the Supervisory Committee will produce annual or twice annual reports and will also review the business cases produced by the FAB Management Board.

Figure 4-57: UK-IR FAB Governance Structure



4.11.22 The FAB would be governed by the FAB Management Board, which will meet quarterly. The Management Board terms of reference set out the following responsibilities:

- To develop and oversee the implementation of a UK-Ireland Annual Plan;
- Make decisions on proposals, recommendations and suggested options from the FAB Working Groups (as supported by business cases);
- To take account of "priority areas" as identified by customers and ANSPs through consultation;
- To monitor and direct the Working Groups, ensuring they maintain a clear customer focus;
- To agree and oversee the implementation of safety and performance FAB metrics and associated targets;
- To determine FAB standards and to ensure that effective arrangements are place for managing them; and

- To develop an annual UK-Ireland report detailing progress on the implementation of FAB initiatives, for review by the NSA FAB Supervisory Committee.
- The trade unions will be represented on the Service Provision working group.

4.11.23 The Management Board is supported by three WGs, whose chair would sit on the Management Board – Airspace Design, Service Provision, and Safety. Each WG will meet quarterly. The Airspace Design and Safety WGs would be co-chaired by a representative from IAA and NATS, while the service provision WG would chaired by a representative of the users on a rotating basis. The users have nominated a chair from BMI and Aer Lingus for the Service Provision Working Group.

4.11.24 Military representatives have been appointed to the FAB Management Board, and the trade unions have an active role on the FAB through membership of the Service Provision Working Group.

AIRSPACE USERS VIEWS*[33]*

4.11.25 During the Feasibility Study, there was only limited consultation with airlines.

4.11.26 Airspace users have recognised the airspace improvements that have been introduced by the two ANSPs over a number of years. This high base level of co-operational is expected to be augmented further as airlines (BMI and Aer Lingus) have been invited and agreed to participate in the FAB Management Board.

4.11.27 The users were disappointed by the overall magnitude of potential benefits from the "Design & Build" approach to the FAB. The airlines believe that there is a risk that the minimalist approach used by UK-Ireland FAB will be copied in other FABs in Europe, where there is not such a tradition of effective operational co-operation between ANSPs.

4.11.28 Moreover, the airlines are concerned that the South-East UK is disconnected from FAB EC and therefore, the key capacity constraints in the TMAs will not be effectively addressed through the current arrangements.

STAFF VIEWS

ETF*[34]*

4.11.29 The two trade unions involved in the UK-Ireland FAB believed there was "minimal involvement" during the feasibility stage.

4.11.30 The trade unions have been briefed on the FAB leading to the announcement of the intention to create the FAB Management Board by both Governments in June 2008.

4.11.31 Following support from the UK Government and discussion with NATS, the trade unions expect to have full involvement in the FAB. The trade unions have received assurances that they will be treated as a key stakeholder in the FAB Management Board structure including involvement in the three supporting work groups.

33 A summary of IATA views from stakeholder consultation.
34 See footnote 9

4.11.32 We understand that the FAB has confirmed that the Trade Unions will be members of the Service Provision working group and their representation on other working groups is under consideration.

PRC ASSESSMENT

4.11.33 The UK-Ireland FAB is the first FAB to be established under the SES legislation. Since the PRC's Interim Report in early 2008, both the Member States and the ANSPs have successfully managed to agree on the proposal, adopt and implement it in the course of six months as it began operations on 14 July 2008.

4.11.34 The UK and Ireland have a long standing relationship and history of operational co-operation. Different options were contemplated, including a fully integrated ANSP, but the practicalities have been such that a more pragmatic, step-by-step approach has been chosen. There was a significant hurdle to further integration in relation to the differences in business size, unit rates and social impact. Their FAB is an operationally driven FAB using an approach of "Design & Build through Partnership with Airlines". Airlines, following discussions, have accepted the challenge to play this key role in developing the future of the FAB.

4.11.35 The set of three MoUs underpinning relationships at the State, NSA and ANSP levels provides a useful comparison for other FABs progressing to implementation. Similarly, the explicit participation of airspace users in the FAB Management Board, putting them at the forefront to identify priorities for operational benefits, is an innovative approach. Users' involvement, participation and commitment become crucial for this "Design & Build" FAB to deliver the expected benefits.

4.11.36 At the outset, the FAB will bring about limited changes to operations, and estimates are for limited financial benefits. No substantial quick wins can be expected in the short term. However, through a committed development programme it has the potential to improve more markedly performance in the medium to longer term, notably in terms of safety, capacity and flight-efficiency/environment. The intention of the FAB Supervisory Committee comprising the two NSAs to review the business cases on an initiative by initiative basis and review the FAB performance plan should ensure commitment to performance improvements.

4.11.37 At this stage, the size of the impact of change from the FAB is uncertain due to the continuing process of assessing the feasibility of changes over the coming years. It would be important that ANSPs and States agree on quantified key performance targets so that performance can be clearly compared against plan.

4.11.38 Final decision-making lies within each respective CEOs of the two ANSPs, so there is a risk that proposals by FAB Management Board are ultimately not supported and implemented.

4.11.39 Finally, there remains a danger that a similar approach could be adopted by other FABs, with a less developed history of co-operation or propensity to introducing changes.

5 CROSS FAB COMPARISONS USING THE FRAMEWORKS

5.1 Introduction

5.1.1 In this chapter we use the descriptive and performance frameworks described in Annex II to compare the nine FAB initiatives.

5.2 Descriptive frameworks

5.2.1 In this section we use the descriptive frameworks to compare:

- the key characteristics of the initiatives;
- the arrangements for establishing and progressing the initiative;
- the timescales of the initiatives; and
- the progress towards implementation.

5.3 Characteristics of the initiatives

5.3.1 This section describes the key changes expected to be introduced as a result of the FAB. These change characteristics of each of the initiatives have been split into four groupings:

- Airspace;
- Service provision;
- Systems; and
- Supervision.

5.3.2 For the majority of the FABs the changes describe those currently proposed, or actively under consideration in their feasibility assessments. The exception to this is in the case of UK-Ireland, which began operations on 14 July 2008, and the characteristics reflect the key priority areas of the initial work programme of the FAB Management Board.

5.3.3 In the case of the FAB feasibility assessments, this should not be taken to mean that the initiative will definitely be implemented in the form described, as no final decision has been taken. We illustrate the proposed characteristics of the initiatives using the characteristics framework described in Annex II.

5.3.4 The characteristics represent changes to be introduced from the FAB, and do not reflect the baseline, existing level of co-operation between ANSPs in the FAB.

OVERVIEW OF THE INITIATIVES

5.3.5 In Figure 5-1 we provide the characteristics of each of the FAB initiatives. These are based upon the consultation and discussions with FAB initiatives, but are ultimately the PRC's assessment of each of the FABs using a common framework.

5.3.6 The results show a wide variety of issues are being pursued by the FABs. Nearly all, as the SES legislation requires are planning to address airspace management issues in their FAB (as highlighted through the green shading). A number seek to address service provision issues: Blue Med, NUAC, FAB CE and FAB EC in

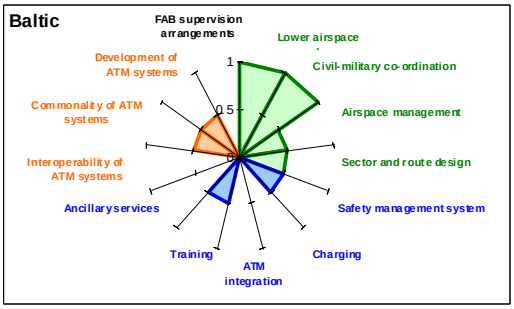
particular (blue shading). The development of ATM systems is being addressed through the Blue Med and NUAC FABs, while FAB CE and FAB EC noticeably address interoperability of ATM systems.

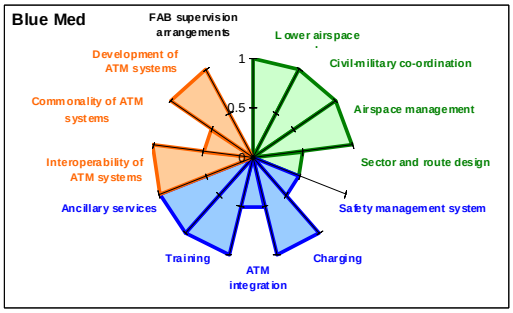
5.3.7 Supervision arrangements to date have only been changed in the UK-Ireland FAB and addressed in FAB CE.

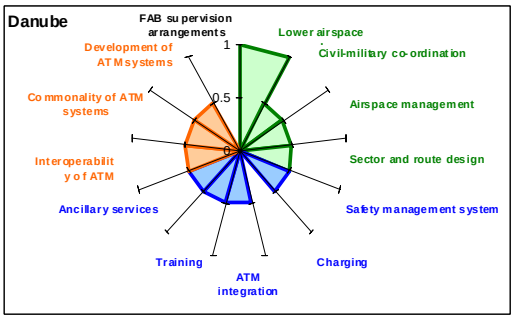
5.3.8 For all the 13 areas displayed, the categorisation 0, 0.5 and 1 used for the characteristics framework is an assessment of the extent **but not necessarily** the effectiveness of it. This framework should not be interpreted as implying that the PRC expects the FAB initiatives to address all the dimensions characterised in the framework. Rather it is a way of highlighting the changes introduced by the FABs and different approach taken across FABs.

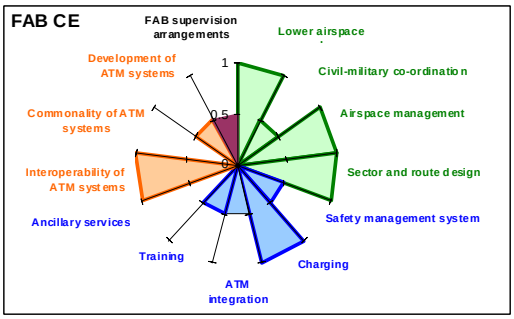
5.3.9 Please note that justifications for these categorisations can be found in the description of each FAB initiative, which are provided in Chapter 0 of this report and in each FAB Fact Sheet found in Annex I.

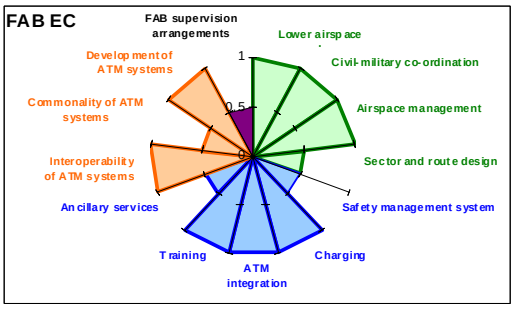
Figure 5-1: Characteristics framework

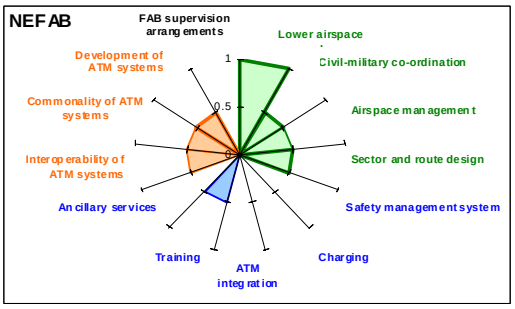


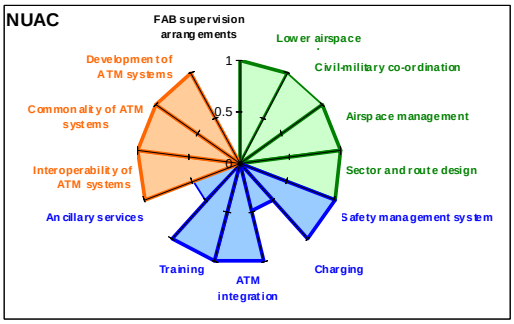


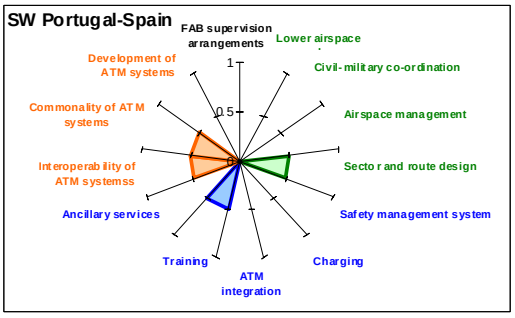


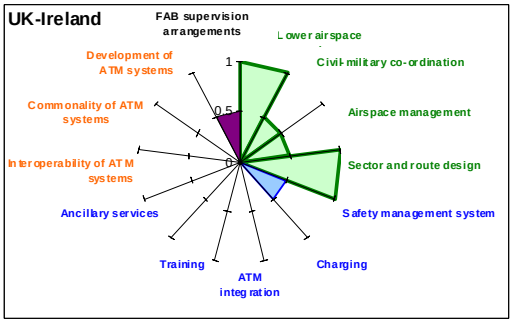












These diagrams describe the expected changes to be introduced as a result of the FAB.

The scores represent an independent assessment based on evidences provided during consultation with each FAB initiative as well as key user and staff stakeholders.

The details for each score is outlined in detail in Chapter 4 and all scores are equally valuable.

The Keys to the graphics are:

- : Airspace
- : Service Provision
- : Systems
- : Supervision

CONCLUSIONS: KEY CHARACTERISTICS FOR EACH INITIATIVE

5.3.10 As outlined above, there are significant differences between the FAB initiatives. The most important proposals of each of the initiatives are summarised in Figure 5-2 below.

Figure 5-2: Key elements of the current initiatives

Programme name	Key changes to be introduced by the FAB
Baltic FAB	Too early in the Feasibility Study phase to determine, but will look at synergies and best practices between the ANSPs
Blue Med	A wide ranging FAB, with a particular focus on interoperability and development of systems, large geographical airspace coverage and the use of Virtual Centres to address service provision improvements.
Danube FAB	Through the Feasibility Study are assessing most airspace and services provision dimensions. The emerging preferred choice for implementation is the co-operation model.
FAB Central Europe	A phased approach to implementation using initial, static and dynamic scenarios shows the ambition of the programme, in particular in airspace design, charging and interoperability
FAB Europe Central	Arguably the most ambitious in terms of scope and geography of the core area. Airspace redesign (in particular to address hotspots cross-border areas), alongside changes to the charging mechanism including consideration of a single unit rate and interoperability of systems.
NEFAB	Very early in the process, pre-Feasibility Study implies the initiative will be confined to airspace and systems issues.
NUAC Programme	A wide ranging programme of change, depicted for the ANSPs current preferred programme of operational alliance, strong co-operation across the systems, airspace and service provision dimensions.
SW Portugal - Spain FAB	Too early in the Feasibility Study phase to determine
FAB UK - Ireland	The FAB Management Board is established with clear supervision arrangements. The focus is on airspace, service provision and safety, with key focus areas under consideration in each. The scope of the FAB may grow as opportunities are identified by the Management Board.

5.4 Arrangements for the FABs

5.4.1 This section describes the key arrangements for the development of the Feasibility Study phase (and lately, implementation for FAB UK-Ireland) of each of the initiatives. These are important in understanding why some initiatives have progressed further than others and may also help to identify risks to the future progress of some of the initiatives. This analysis is undertaken using the Arrangements Framework discussed in Annex II. The justifications for each of the FAB scores are provided in Chapter 0 and Annex I containing the Fact Sheets for each FAB.

5.4.2 For all the nine areas displayed, the categorisation 0, 0.5 and 1 used for the framework is an assessment of the extent **but not necessarily** the effectiveness of it.

OVERVIEW

5.4.3 Figure 5-3 shows the arrangements frameworks for all nine FAB initiatives. The arrangements frameworks shown reflect information gathered at the bilateral meetings, but ultimately represent the PRC's assessment using the common framework and scoring mechanism.

5.4.4 The FAB arrangements demonstrate a variation across the nine FABs. For three, Baltic, SW Portugal – Spain, and NEFAB, the arrangements are still under consideration and subject to significant future development.

5.4.5 UK-Ireland and NUAC have mature arrangements as they are either in the operational or final decision phase of the FAB. FAB EC, FAB CE, Blue Med and Danube FAB arrangements reflect that they are either coming to the close of their Feasibility Study phase or are at the beginning of a deployment/ development phase in preparation for a preferred option.

5.4.6 The level of State guidance remains mixed with a number of the FABs still experiencing very limited guidance.

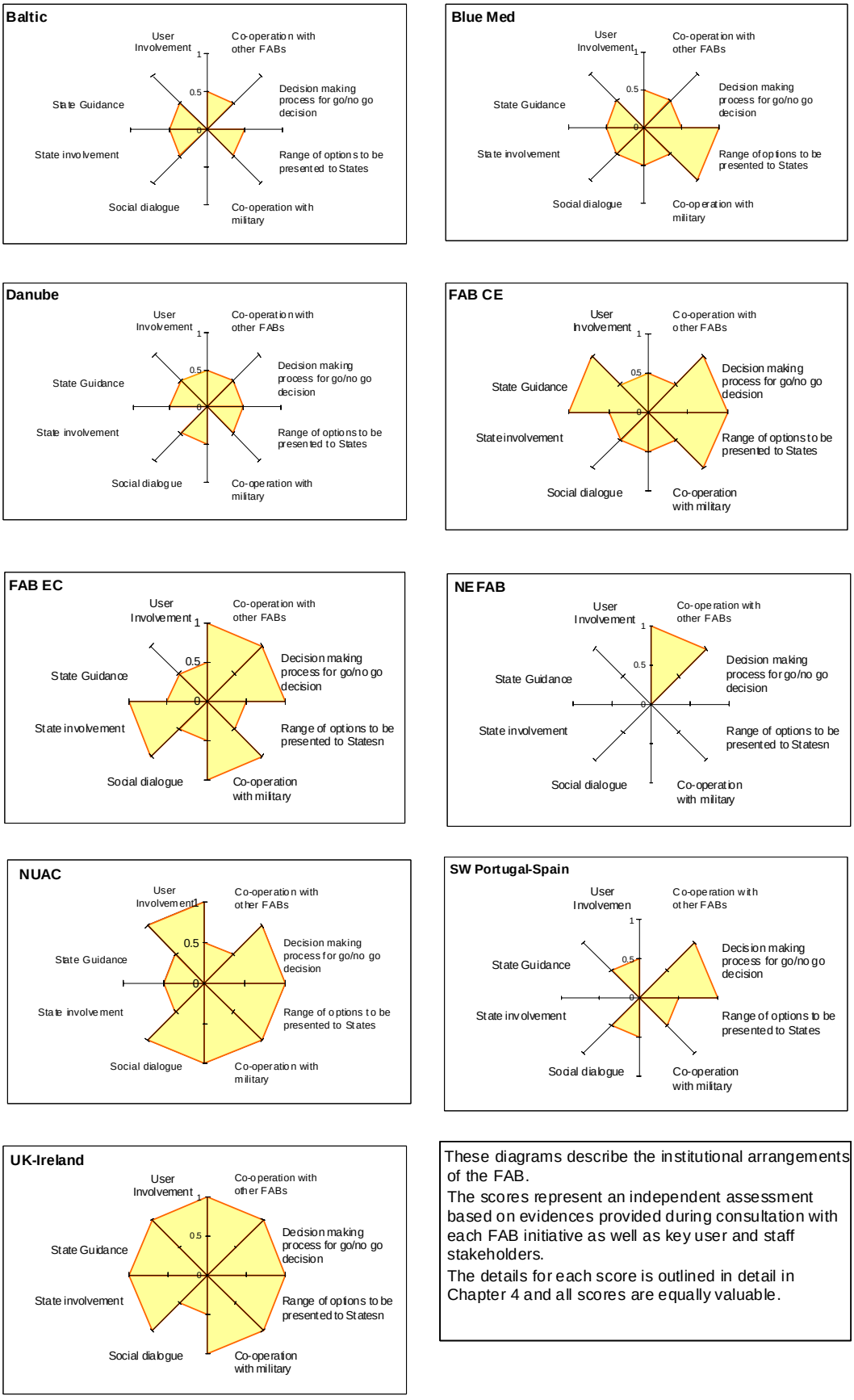
5.4.7 The level of social dialogue and user involvement and stakeholder perception are discussed in greater detail in Chapter 0.

5.4.8 Co-operation with the military is particularly progressed in the FAB EC, NUAC and UK-Ireland FABs and progress is being made in FAB CE and Blue Med. In FAB CE a joint civil-military co-ordination body will be established (JC-MACB).

5.4.9 In most of the FABs, the Feasibility Study has identified and presented a range of options for decision makers' consideration.

5.4.10 The level of co-operation between FABs is varied with most FABs. In most cases, it is very limited, FABs having being working on their feasibility studies over the last couple of months. Some FABs have pointed out the need for a more "institutionalised" inter FAB cooperation to be established in the future. For the time being an informal mechanism (PIM meetings) has been organised by EUROCONTROL, and some ANSPs are observers in other FAB initiatives.

Figure 5-3: Arrangements framework



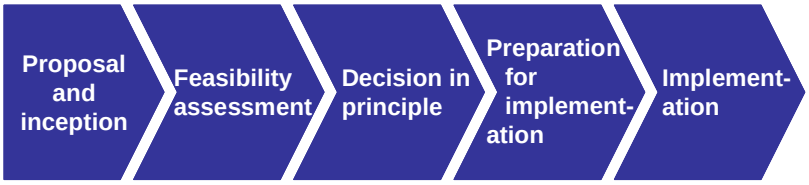
These diagrams describe the institutional arrangements of the FAB.

The scores represent an independent assessment based on evidences provided during consultation with each FAB initiative as well as key user and staff stakeholders.

The details for each score is outlined in detail in Chapter 4 and all scores are equally valuable.

5.5 Timescale

5.5.1 In Annex II, we describe the five generic phases for implementation of a FAB initiative that we had identified.



5.5.2 As discussed in Chapter 0, different FAB initiatives have been organised in different ways and the phases we identified were not intended to imply that FABs should be implemented in a particular way. In particular, although all FABs have a 'feasibility assessment' stage prior to making a decision about whether to proceed and which option to select, in a number of cases this phase does not include the full range of tasks that we identified. Some of these tasks would be undertaken later as part of what we describe as the 'preparation for implementation' phase, and therefore this phase would be, for these initiatives, more extensive. This phase has been described as the definition, design or development phase of the FAB implementation.

5.5.3 In part, this difference arises because FAB initiatives differ in their views as to what is necessary to be done in order to make a decision as to whether to proceed with the programme or which option to select. For example, although safety risk assessment is a key part of the feasibility assessment phase for some initiatives (such as FAB EC), the NUAC Programme argued that a detailed safety case should only be performed when the final option is agreed.

5.5.4 Moreover, it is recognised that some FABs will introduce value-added changes on a gradual basis and that each FAB's activities are likely to ramp up over time. On the basis of the current programmes we have reviewed more significant changes can be expected in the longer run as compared to the 'quick wins' targeted in the shorter term.

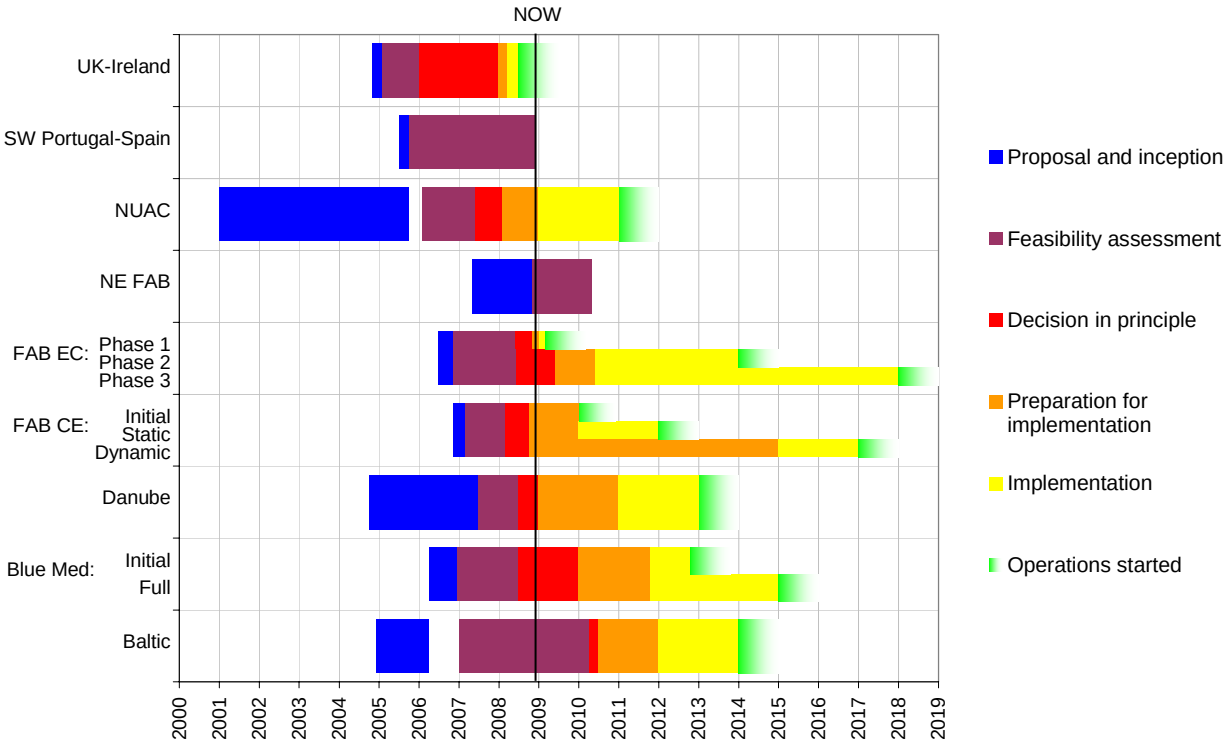
5.5.5 We do not seek to make any judgement within this section about what elements each phase should include, or which approach to the organisation of the FAB implementation is best. Therefore, and in order to facilitate comparison between initiatives, we have presented the progress and projected timescales of each of the FAB initiatives using the five phases that we identified.

5.5.6 Ultimately, the objective of this framework is to assess progress over time.

TIMESCALE FOR IMPLEMENTATION

5.5.7 Using the information provided by each FAB initiative, we have estimated the potential timescale for each of the phases of the project up to implementation, and this is shown in Figure 5-4 below:

Figure 5-4: Timescale for implementation framework



5.5.8 Since the PRC Interim Report, the timescales for FAB CE have become clearer as a result of the targeted Initial, Static and Dynamic scenarios. Danube, FAB EC, Blue Med and FAB CE timescales are clearer as they have progressed and finalised their feasibility studies.

5.5.9 The Baltic, NEFAB and SW Portugal-Spain FABs have no firm plans beyond the Feasibility Study.

PROGRESS TO DATE

5.5.10 Our evaluation of the progress that each FAB initiative has made is shown in Figure 5-5 below. UK Ireland is excluded as it has implemented on the 14 July 2008.

5.5.11 The most advanced programmes, the NUAC Programme and FAB EC, have completed most of the tasks in the first three phases we have identified, and most of the remainder are underway. The NUAC programme is close to taking a decision about whether to proceed with implementation although it considers that some of the tasks we have identified do not need to be completed in order to make this decision.

5.5.12 Most of the other FABs are in the middle of further assessment of options before proceeding to a go/no-go decision. Significant progress has been made for each of Blue Med, FAB EC and FAB CE since the PRC's Interim Report. FAB CE has agreed the feasibility study results and States and ANSPs have declared their support to development the next stage of work towards the implementation of the FAB.

Figure 5-5: Progress framework

Proposal and inception		Baltic	Blue Med	Danube	FAB CE	FAB EC	NEFAB	NUAC	SW Portugal-Spain
High level concept elaborated and proposed to potential partners by initiator (State or									
Possibility of a FAB in outline form agreed by Member States or ANSPs									
If initiative led by ANSPs rather than government, governments of the Member States consulted									
Agreement to proceed with study development obtained in principle from all of the concerned parties (States, NSAs, ANSPs, military)									
Governance arrangements for the concept/feasibility stage established:	High level policy								
	Steering group								
	Project management structure								
	Working groups								
Arrangements (contract) between parties finalised	Project charter/terms of reference defined								
	Obligations defined								
	Financial arrangements defined								
	Break clauses defined								
	Assessment criteria defined								
Project management structure for the pre-implementation activities created									
Project plan for the pre-implementation activities formulated									
External support procured (if required)									

Feasibility assessment									
Refinement of scope: options for geographical scope of the FAB defined and assessed									
Operational	Common operational concept defined								
	Airspace design and sectorisation defined								
	Risk and contingency plans defined								
	Operational implementation plan defined								
	Performance assessment defined								
	Ancillary service provision defined								
Technical	Current approach(es) and services documented								
	Future technical solutions and services defined								
	Technical roadmap defined								
	Common maintenance concepts defined								
	Technical implementation plan defined								
Civil/military: options defined and assessed									
Institutional	Options for institutional characteristics defined and assessed								
	State agreements (inc sovereignty and liability) defined								
	Regulatory and governance arrangements (NSAs) defined								
Human resources and change	Social plan established								
	Training plan developed								
Financial	Cooperation models defined								
	Charging arrangements defined								
	Availability of external funds assessed								
Safety	Preliminary safety case assessed								
	Safety management plan developed								
Ongoing consultation with stakeholders	ANSPs								
	Governments								
	NSAs								
	Military								
	Staff representatives								
	Others, inc airspace users, EC								

Decision in principle									
Shortlist of options based on feasibility outcomes identified									
Cost benefit analysis to establish that FAB would generate performance improvements sufficient to offset costs:	Capacity, delay and predictability assessed								
	Flight efficiency assessed								
	Capital costs assessed (inc. availability of external funding assessed)								
	Project impact on operating costs, inc. productivity and support costs assessed								
	Cost impact on users assessed								
Risk assessment performed									
Environmental impact assessment performed									
Preferred option selected by managing body of initiative									
Preferred option selected by state									

5.6 Key next steps for the FAB initiatives

5.6.1 This section explains the progress planned over the next 12 months by the FAB initiatives. This is summarised in Figure 5-6 below.

Figure 5-6: Progress expected by July 2009

Programme name	Progress expected
Baltic FAB	Aim to complete initial feasibility assessment by end of 2008, followed by a full feasibility study by quarter 1 in 2010
Blue Med	To start the Definition Phase of the project.
Danube FAB	Decision at State level over the preferred option for the FAB and to start the Preliminary Design phase
FAB Central Europe	Definition and definition phases of Initial scenario. Late 2008 a MoU to be signed by States, followed by drafting of FAB agreement for the states. Preparation for implementation and establishment of joint civil-military body for airspace coordination.
FAB Europe Central	Late 2008, a declaration of intent to be issued by Member States, trial of the new ATFCM-ASM function involving a sub-set of ANSPs in 2009, Treaty between States to be ready for signature
NEFAB	Undertake feasibility assessment
NUAC Programme	Go/no-go decision by the States: late 2008-early 2009. Preparation for implementation (detailed planning for implementation phase): 2008-2009. Certification process – starting in 2009, lasting 6 months Implementation: from 2009.
SW Portugal-Spain FAB	Preferred option for FAB to be presented for States decision in October 2008. Both ANSPs' CEOs have decided in October 2008 to undertake a feasibility study during 2009.
FAB UK-Ireland	FAB Management Board to investigate the key performance focus areas identified during the feasibility stage

5.7 Performance framework

5.7.1 In this section we use the performance framework to compare the FAB initiatives using:

- Safety;
- Economic, operational, environmental and technical efficiency.

5.7.2 We use both the primary and secondary Key Performance Indicators (KPIs) as well as descriptive measures of operational and technical elements of the FAB initiatives.

5.8 Safety

5.8.1 Safety is of paramount importance to the development of the FAB. Most of the FABs have an objective of maintaining or improving the level of safety resulting from the FAB. In Annex II, where we set out our framework for evaluation we explain the limitations of the metrics currently available to measure safety performance. This section describes the metrics we intend to use on an ongoing basis and current values for them.

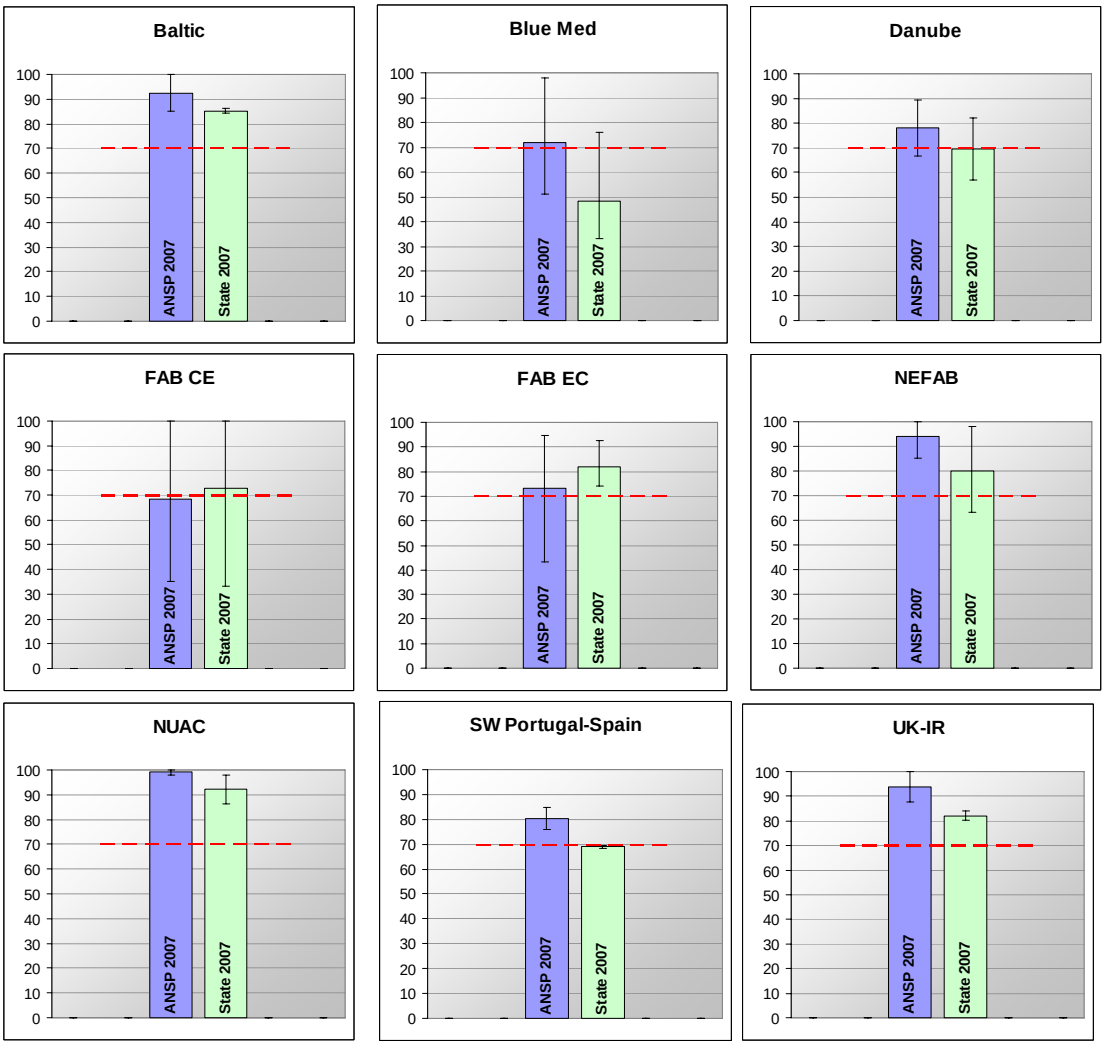
AIRSPACE EVENTS PER FLIGHT-HOUR

5.8.2 Airspace events (A and B) per flight-hour as used in PRR 2007 and as supplied by EUROCONTROL. The PRC has not incorporated them into this report following guidance from the SRC.

SAFETY MATURITY

5.8.3 Safety maturity scores assessed during 2007 for both ANSPs and Member States are shown in Figure 5-7. We have used the **simple average** scores for each initiative. FABs with below the 70% benchmark include Blue Med (State), FAB CE (ANSPs), SW Portugal-Spain (State).

Figure 5-7: Safety maturity scores by FAB average



COMPLIANCE WITH ESARRS

5.8.4 In Figure 5-8 we set out the compliance with ESARR requirements. It shows, with the exception of the Baltic FAB that is expected to be fully compliant in 2009, that all FABs have Member States with only partial compliance with the ESARR requirements despite the date of entry into force which, is in some cases, 6 years in the past.

5.8.5 There appear to be particular issues in Spain, Norway, Bulgaria, Greece, Croatia and Bosnia & Herzegovina from late or only partial compliance. However, with the exception of Sweden, all other Member States are not yet fully compliant.

Figure 5-8: Compliance with ESARR requirements (Source: LCIP 2008-2012)

		ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
	Due fully by:	05-11-2007	01-01-2002		31-03-2008	13-07-2003		05-04-2004		11-04-2005	
Baltic FAB	State	Reg	ANSP	Reg	AST sent	ANSP	Reg	ANSP	Reg	ANSP	Reg
	Lithuania	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Poland	✓	✓	✓	✓	✓	✓	✓	✓	Planned	✓

		ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
	Due fully by:	05-11-2007	01-01-2002		31-03-2008	13-07-2003		05-04-2004		11-04-2005	
Blue Med	State	Reg	ANSP	Reg	AST sent	ANSP	Reg	ANSP	Reg	ANSP	Reg
	Cyprus	✓	✓	✓	No report	✓	✓	Late	Late	✓	✓
	Greece	Late	Partial	Partial	No report	Partial	Partial	Partial	Partial	Late	Late
	Italy	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Malta	✓	✓	✓	✓	✓	✓	✓	Partial	✓	✓

		ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
	Due fully by:	05-11-2007	01-01-2002		31-03-2008	13-07-2003		05-04-2004		11-04-2005	
Danube	State	Reg	ANSP	Reg	AST sent	ANSP	Reg	ANSP	Reg	ANSP	Reg
	Bulgaria	Partial	✓	Partial	No report	✓	Late	✓	under rev	✓	Partial
	Romania	Planned	✓	✓	✓	✓	✓	✓	✓	✓	✓

		ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
	Due fully by:	05-11-2007	01-01-2002		31-03-2008	13-07-2003		05-04-2004		11-04-2005	
FAB CE	State	Reg	ANSP	Reg	AST sent	ANSP	Reg	ANSP	Reg	ANSP	Reg
	Austria	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bosnia & Herzegovina	Late	Late	Late	No report	Late	Late	Late	Late	✓	✓
	Croatia	✓	✓	Late	No report	✓	Late	Late	Late	✓	Late
	Czech Republic	Partial	✓	✓	✓	✓	Partial	✓	Partial	✓	✓
	Hungary	Planned	✓	Partial	✓	✓	Partial	✓	Partial	✓	✓
	Slovakia	Late	✓	✓	✓	✓	✓	✓	Late	✓	✓
	Slovenia	✓	✓	✓	No report	✓	✓	✓	Late	Late	Late

		ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
	Due fully by:	05-11-2007	01-01-2002		31-03-2008	13-07-2003		05-04-2004		11-04-2005	
FAB EC	State	Reg	ANSP	Reg	AST sent	ANSP	Reg	ANSP	Reg	ANSP	Reg
	Belgium	Partial	✓	✓	✓	✓	✓	✓	Late	✓	Partial
	France	✓	✓	✓	✓	✓	✓	✓	✓	Late	Partial
	Germany	✓	✓	✓	✓	✓	✓	✓	Partial	✓	Partial
	Luxembourg	Partial	✓	✓	No report	✓	✓	✓	Partial	✓	Partial
	Netherlands	Partial	✓	Late	✓	✓	Partial	✓	Partial	✓	Partial
	Switzerland	Partial	✓	✓	✓	✓	✓	✓	Partial	✓	Late

		ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
	Due fully by:	05-11-2007	01-01-2002		31-03-2008	13-07-2003		05-04-2004		11-04-2005	
NEFAB	State	Reg	ANSP	Reg	AST sent	ANSP	Reg	ANSP	Reg	ANSP	Reg
	Denmark	Late	✓	Partial	✓	✓	Partial	✓	Partial	✓	✓
	Estonia	✓	✓	✓	✓	✓	✓	✓	Partial	✓	✓
	Finland	✓	✓	✓	✓	✓	✓	✓	Partial	✓	✓
	Norway	Late	✓	Late	✓	✓	✓	✓	Late	✓	✓
	Sweden	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

		ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
	Due fully by:	05-11-2007	01-01-2002		31-03-2008	13-07-2003		05-04-2004		11-04-2005	
NUAC	State	Reg	ANSP	Reg	AST sent	ANSP	Reg	ANSP	Reg	ANSP	Reg
	Denmark	Late	✓	Partial	✓	✓	Partial	✓	Partial	✓	Partial
	Sweden	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

		ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
	Due fully by:	05-11-2007	01-01-2002		31-03-2008	13-07-2003		05-04-2004		11-04-2005	
SW Portugal-Spain FAB	State	Reg	ANSP	Reg	AST sent	ANSP	Reg	ANSP	Reg	ANSP	Reg
	Portugal	✓	✓	✓	✓	✓	Partial	✓	Partial	✓	Late
	Spain	✓	✓	✓	✓	✓	✓	✓	✓	✓	Late

		ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
	Due fully by:	05-11-2007	01-01-2002		31-03-2008	13-07-2003		05-04-2004		11-04-2005	
UK-IR FAB	State	Reg	ANSP	Reg	AST sent	ANSP	Reg	ANSP	Reg	ANSP	Reg
	Ireland	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UK	Partial	✓	✓	✓	✓	Partial	✓	under rev	✓	✓

Note: for Austria, Italy, Poland and Spain, the 2008 evaluation has been updated for comments received during the Draft Final Report consultation in October 2008. For those States, the data are therefore not consistent with the LCIP 2008-2012 data.

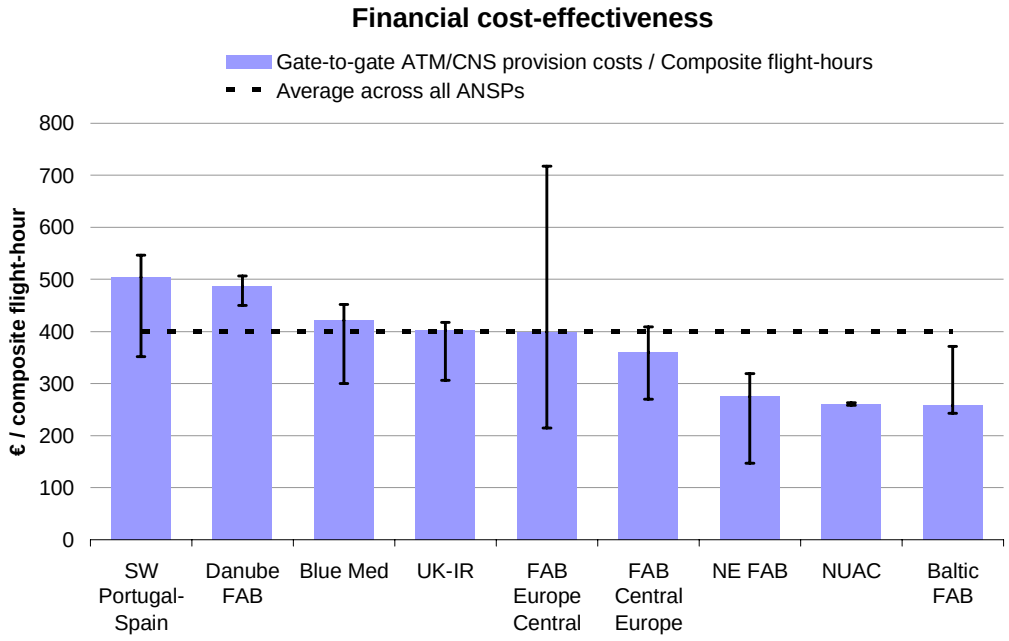
5.9 Economic efficiency

5.9.1 In this section we outline the KPIs we have identified to monitor FABs economic efficiency. These build on the PRC's ACE analysis, and we present the values by FAB for each of the KPIs using the latest ACE data (2006), the metrics are described in Annex II outlining our performance framework. The graphics show the range of variation both within individual FABs and between FABs.

KEY PERFORMANCE INDICATORS

5.9.2 We measure financial cost-effectiveness in terms of gate-to-gate ATM/CNS provision costs per composite flight-hour[35]. On this measure, FAB groupings vary between unit costs of €504 for SW Portugal-Spain and €258 for Baltic FAB. FAB EC shows the widest variation within the FAB: Belgocontrol has unit costs of €718 (but only serves lower airspace with associated high level of complexity), and MUAC has unit costs of €215 (but only services upper airspace)[36]. A large disparity within a FAB may be an obstacle to integration of operations and charging arrangements, but can also be an opportunity for significant savings if the FAB leads towards alignments on best performers and allow more effective exploitation of scale effects. There will always be a risk that a FAB might orientate their cost arrangements (and especially wages conditions) towards the highest-cost ANSP.

Figure 5-9: Financial cost-effectiveness (2006)



Source: ACE 2006 report

5.9.3 Figure 5-10 and Figure 5-11 show the trends of en-route unit costs per FAB as computed from the 2007 States submissions to the Enlarged Committee until 2011 (CRCO data). This data represents the data used for en-route charges at State level and therefore differs from data related only to ANSPs. In fact, Figure 5-10 shows that trends are already decreasing without FABs, especially for Blue Med, FAB EC, UK-Ireland.

35 All details related to these metrics are provided in the ACE 2006 Benchmarking Report.

36 The figure for MUAC reflects the unique status of MUAC as a specific provider for upper airspace control.

Figure 5-10: Trends in financial cost-effectiveness per FAB (2002-2011 in real terms)

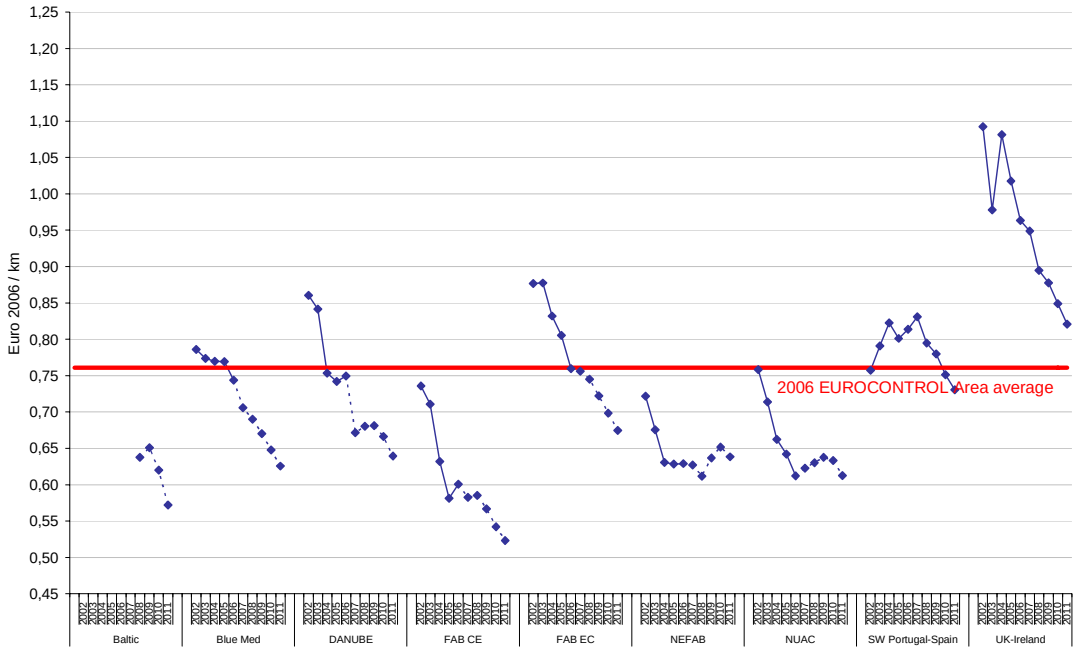
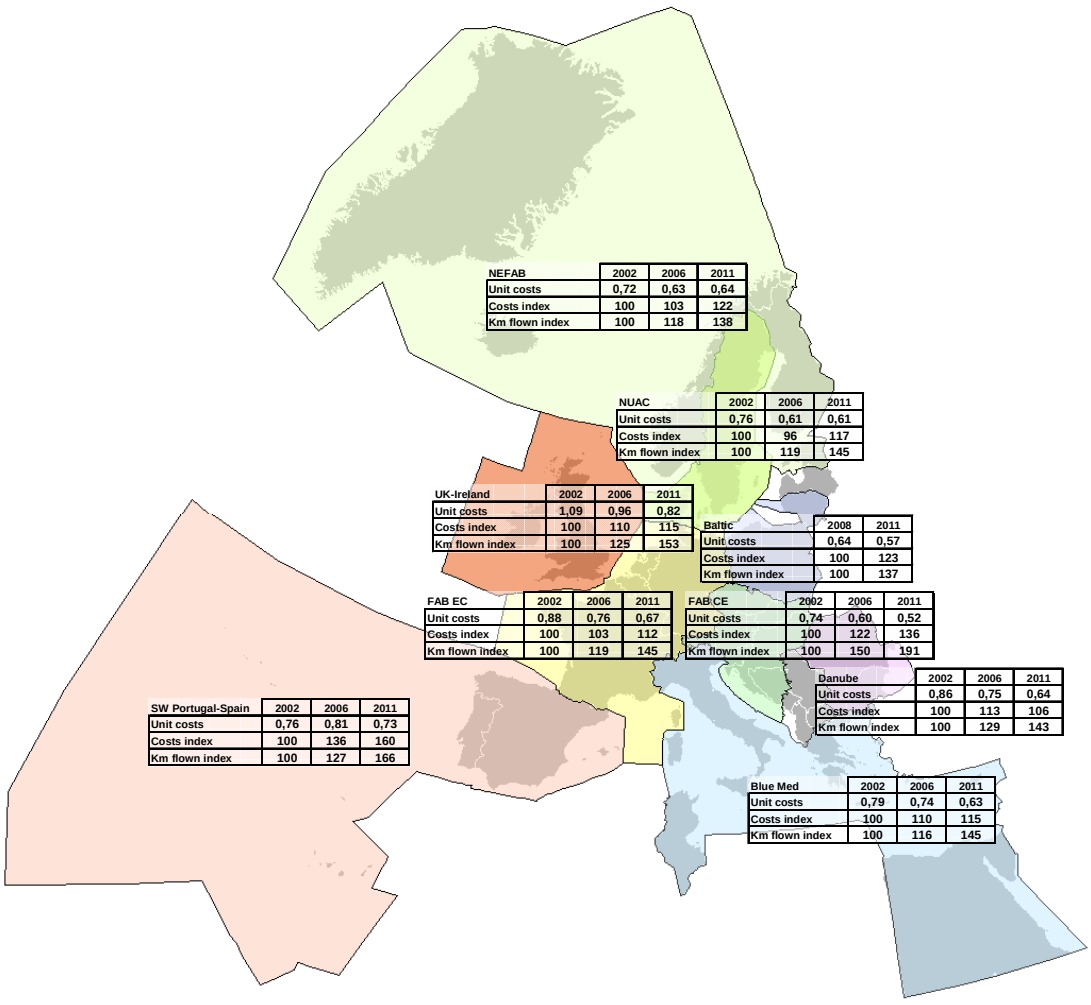
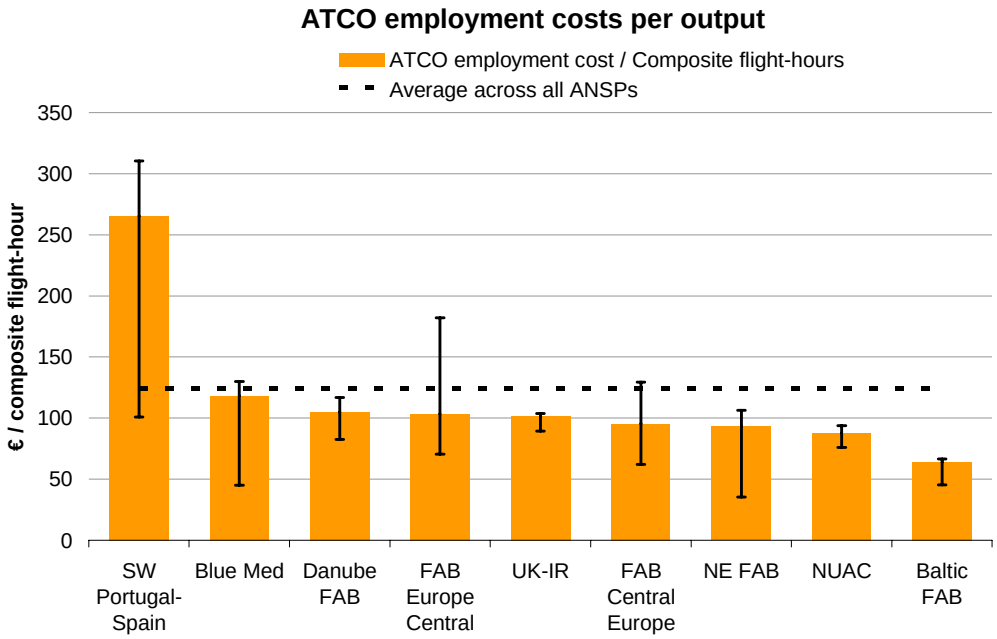


Figure 5-11: Map of the trend of en-route unit costs per FAB (2002-2011 in real terms)



5.9.4 The employment costs of air traffic control officers (ATCOs) in operations per composite flight-hour shows a wider variation between FABs. Spain and Portugal both have relatively high employment costs for ATCOs. As a result, the SW Portugal-Spain FAB has an ATCO in OPS employment cost of €265 per composite flight-hour, over double the nearest other FAB (Blue Med, with €118). On this metric, Baltic FAB is the least expensive FAB, with an ATCO in OPS employment cost of €64 per composite flight-hour.

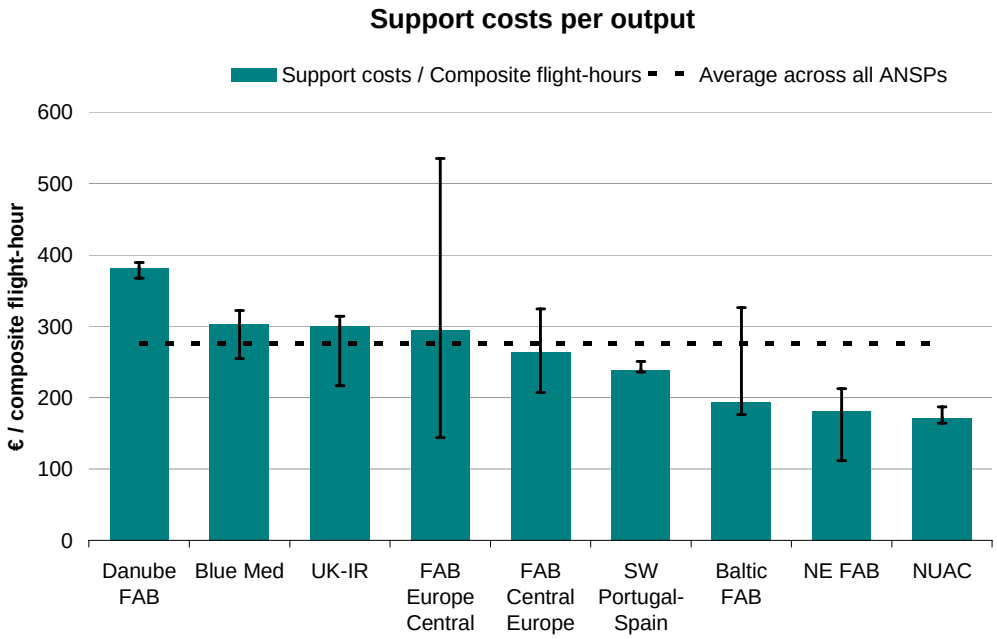
Figure 5-12: ATCO employment costs per composite flight-hour (2006)



Source: ACE 2006 report

5.9.5 When employment costs for ATCOs are excluded, the remaining support costs vary between €382 per composite flight-hour for Danube FAB and €172 for NUAC. As with the overall costs, the greatest variation within individual FABs is seen in FAB EC where Belgocontrol has support costs of €535 per composite flight-hour (lower airspace only) and MUAC has €144 (upper airspace only).

Figure 5-13: Support costs per composite flight-hour (2006)



Source: ACE 2006 report

5.9.6 Clearly, there are significant variations within some FABs in terms of cost-effectiveness measures. This may have an impact on how much convergence and at which speed could be achieved between the organisations making up a FAB.

SUPPORTING METRICS RELATED TO ATCO EMPLOYMENT COSTS

5.9.7 In support of the KPI on ATCO employment costs, we have calculated the average ATCO costs per head with and without PPP adjustments in Figure 5-14 and Figure 5-15. The graphics show that by both measures the costs in Spain and Portugal are the highest of all the FABs. With no PPP adjustment the next highest are UK-Ireland and Blue Med FABs. When taking PPP into account FAB CE is calculated as the second highest cost per head.

Figure 5-14: ATCO cost per head – no Purchasing Power Parity (PPP) adjustment (2006)

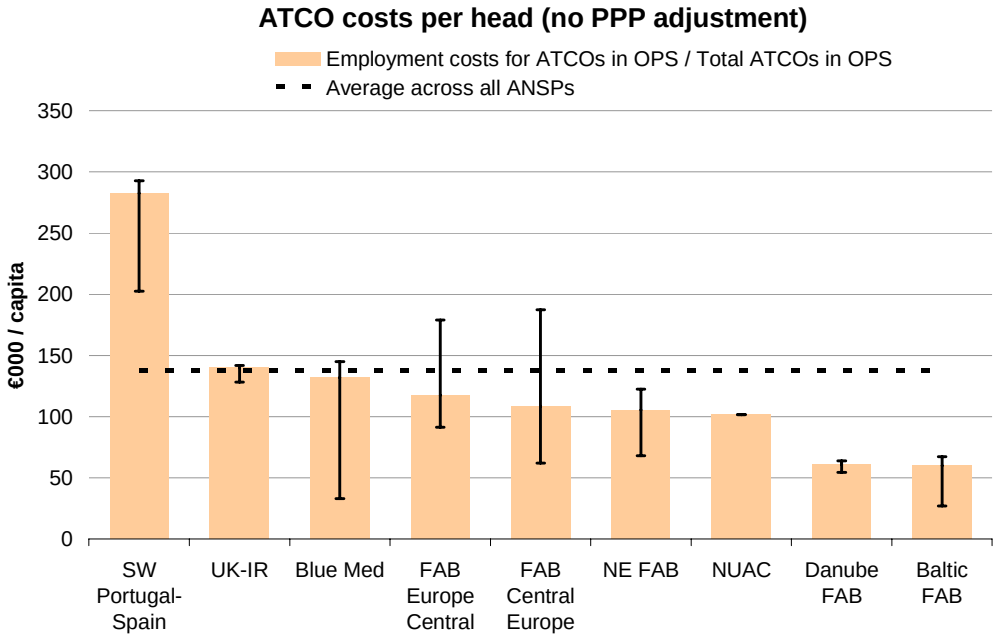
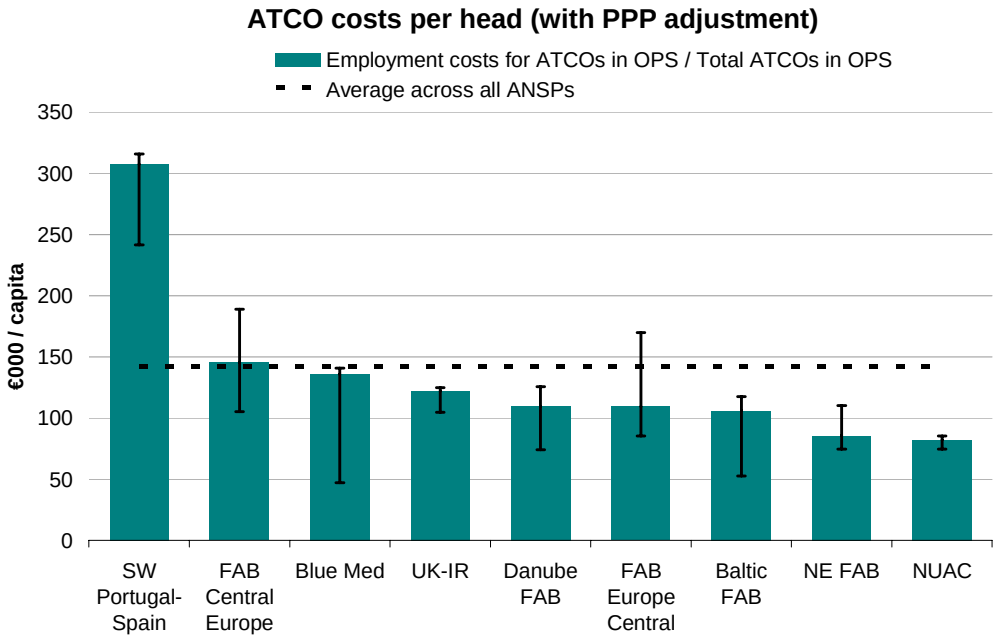
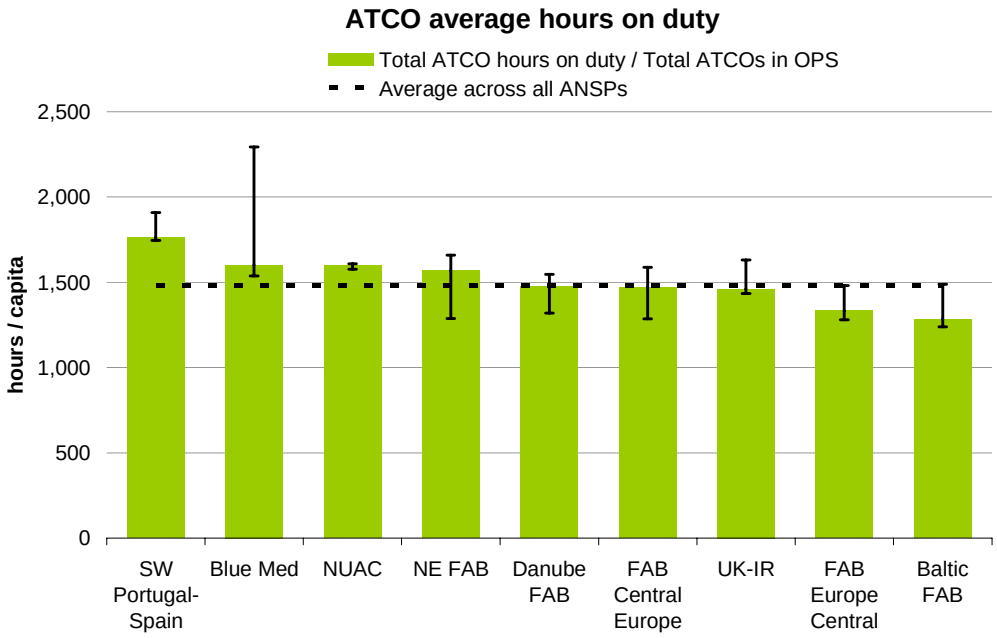


Figure 5-15: ATCO cost per head – with PPP adjustment (2006)



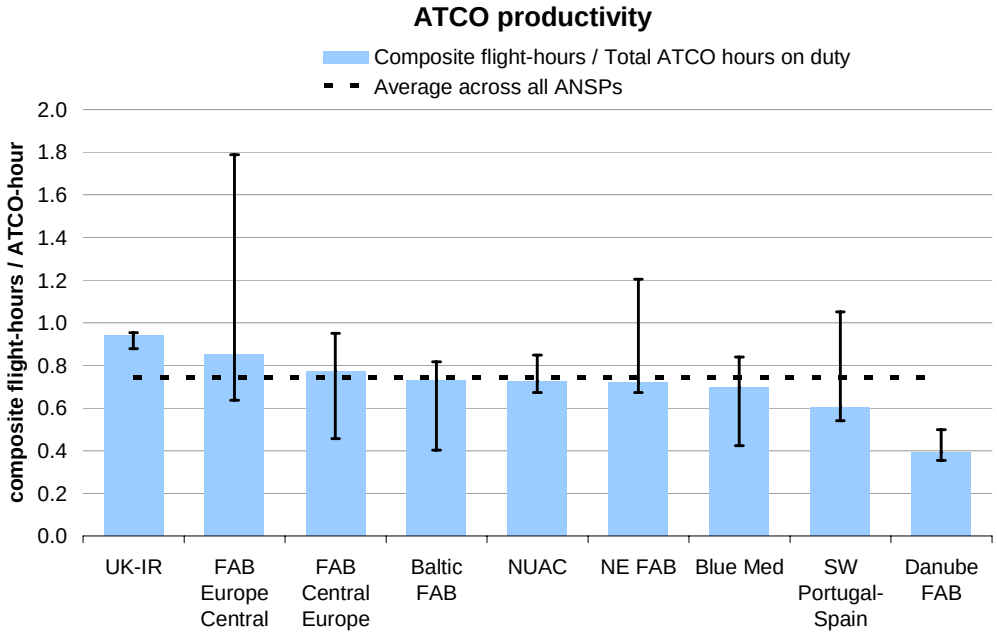
5.9.8 Figure 5-16 shows the average ATCO hours on duty per controller for each of the FABs. SW Portugal-Spain has the highest hours per annum of 1,763. Baltic has the lowest with 1,284 hours per annum per controller. The range within the FAB is particularly large for Blue Med.

Figure 5-16: ATCO average hours on duty (2006)



5.9.9 Figure 5-17 show the level of ATCO productivity by FAB (as measured by composite flight hours per ATCO-hour on duty). The UK-Ireland FAB is the most productive using this measure with Danube FAB the least productive. SW Portugal-Spain, NEFAB and FAB EC have wide ranges in ATCO productivity within ANSPs in their FABs.

Figure 5-17: ATCO-hour productivity (2006)

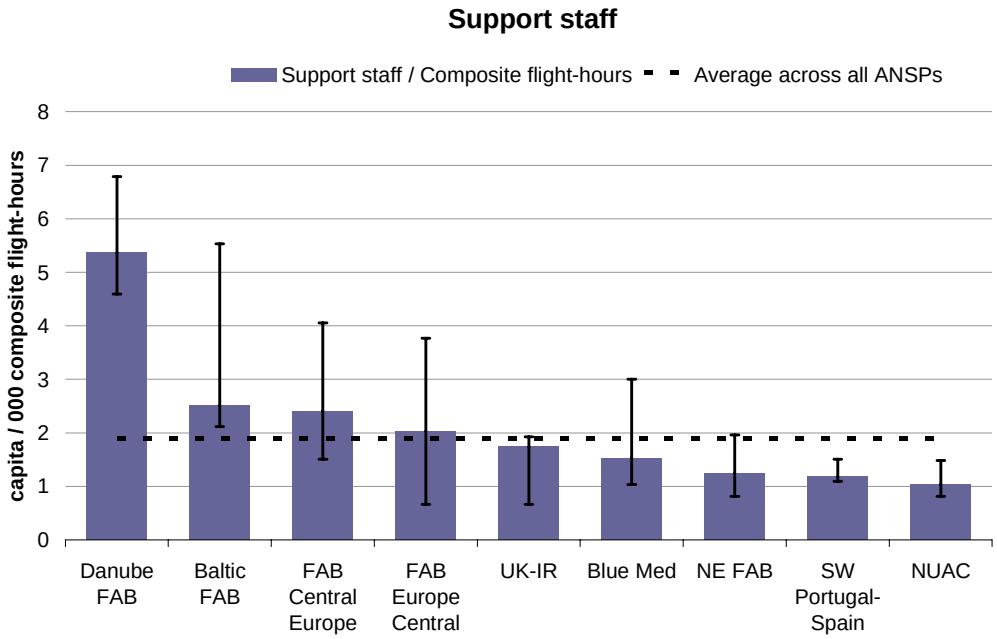


SUPPORTING METRICS RELATED TO SUPPORT COSTS

5.9.10 To substantiate the primary KPI for support costs, Figure 5-18 calculates the number of support staff per '000 of flight-hours. Danube FAB has the highest ratio on average, with more than 5 support staff per '000 of flight-hours. NUAC has the lowest value, despite the fact that both Danube FAB and NUAC have a

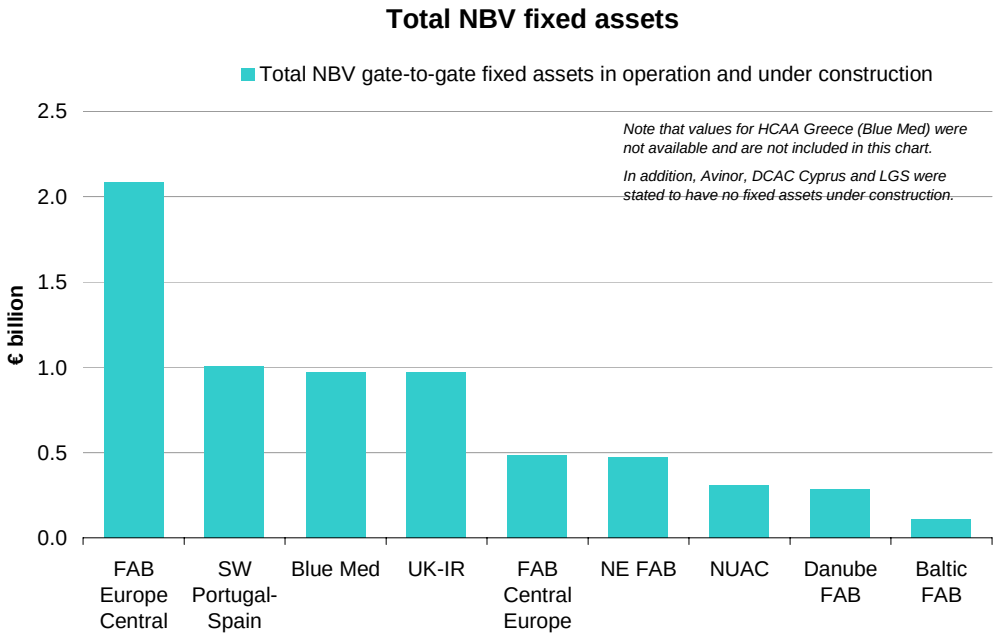
similar size in terms of flight-hours. Significant ranges in the constituent ANSPs are found for Baltic, FAB CE and FAB EC.

Figure 5-18: Support staff per /'000s of flight hours (2006)



5.9.11 Figure 5-19 shows the Total Net Book Value (NBV) of fixed assets for each of the FABs. It can be seen that in terms of this indicator FAB EC is by far the largest FAB. NUAC, Baltic and Danube are all relatively small in terms of the total NBV of assets.

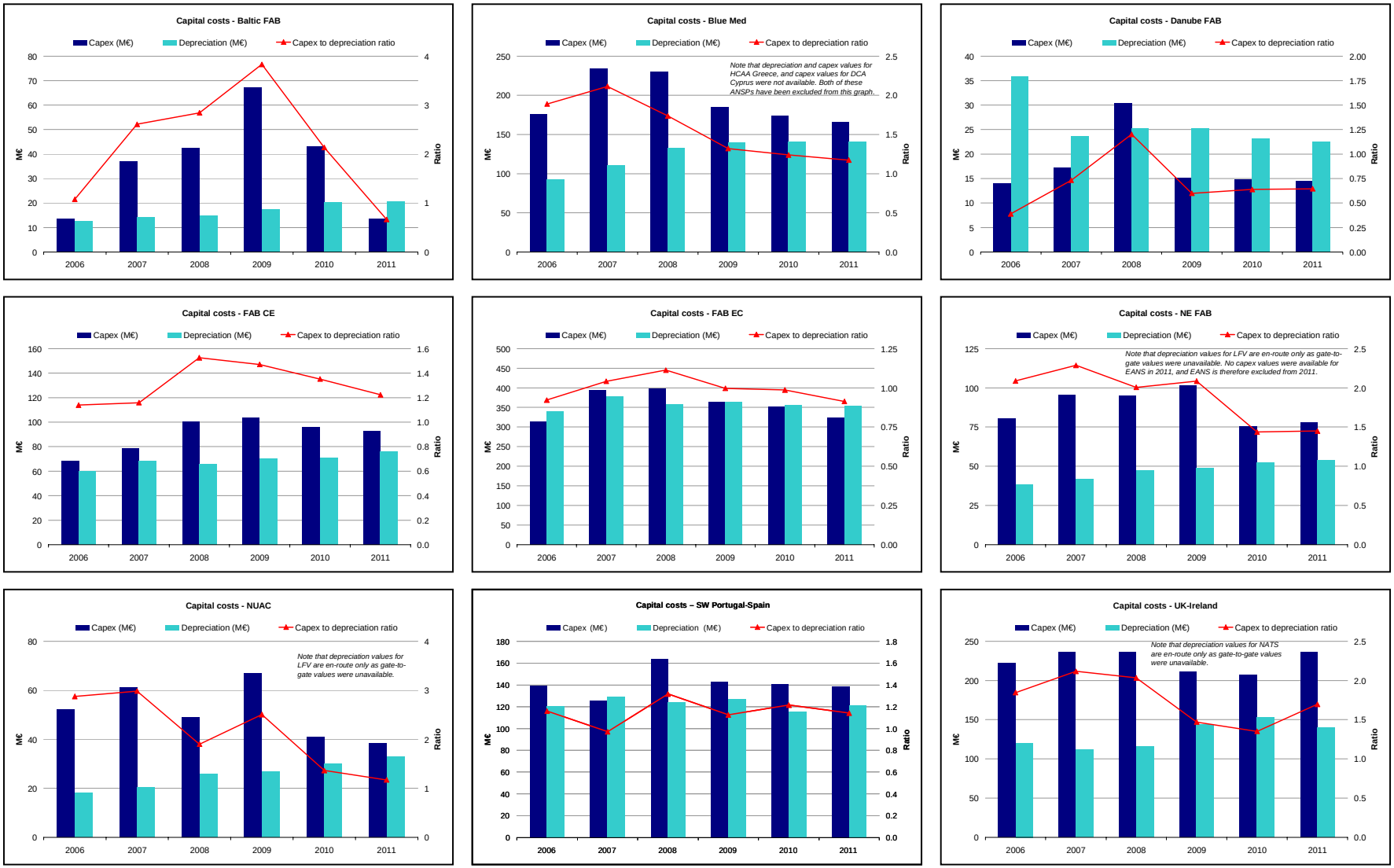
Figure 5-19: Total NBV fixed assets (2006)



5.9.12 Figure 5-20 shows the profile of FAB capital expenditure, accounting depreciation charges and the ratio between the values by FAB. These graphics use the projections from the ACE data covering the period 2007-2011. Where only incomplete data is available this is noted in each of the graphics.

5.9.13 This indicator will be used to see if FABs change their capital expenditure plans as a result of particular initiatives. In general, with the exception of the Danube FAB the capital expenditure to depreciation ratio is greater than one, implying greater capital costs are expected to be incurred in the future than in the past. This, in part, reflects inflation but also that ATM continues to be a capital-intensive industry.

Figure 5-20: Projected capital expenditure and depreciation costs (2006-2011)



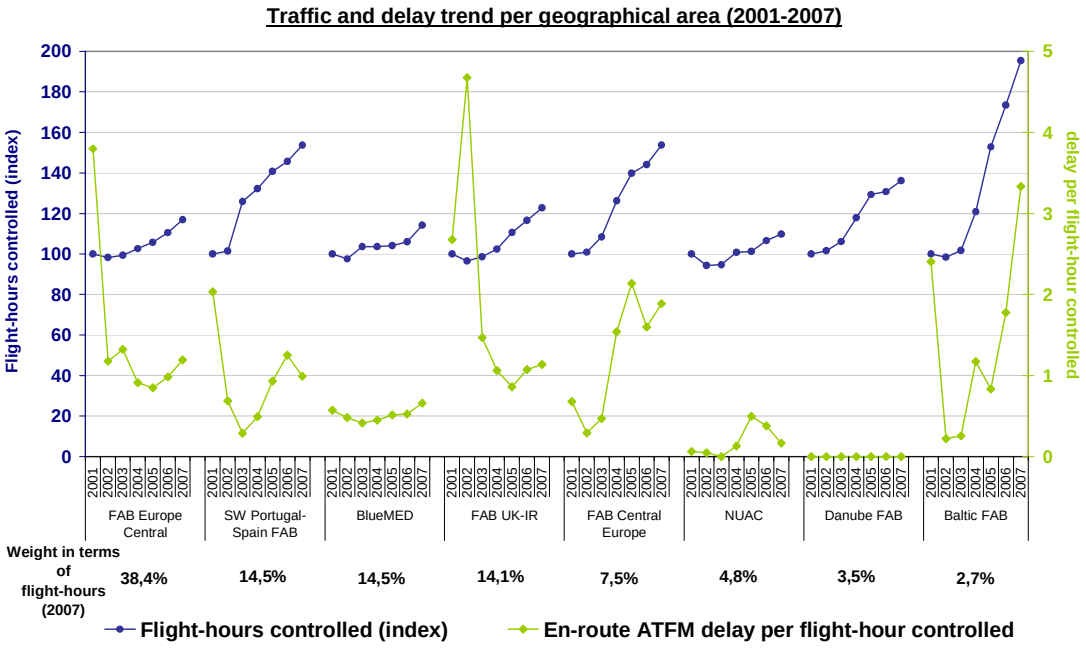
5.10 Operational efficiency

KEY PERFORMANCE INDICATORS

ATFM DELAY PER FLIGHT-HOUR

5.10.1 Figure 5-21 presents for each FAB initiative the evolution of the traffic in terms of flight-hours (base 100 in 2001) and the ATFM delay per flight-hour controlled. The figure shows the range of situations that the FAB initiatives have to face: In some, such as Danube FAB, there is no capacity issue (hence no ground ATFM delays) while in some others (FAB CE, SW Portugal-Spain FAB and Baltic FAB) ATFM delays are increasing significantly. At the same time, the evolution of traffic varies significantly: most of the FAB initiatives are facing steadily increasing traffic while some others (NUAC, Blue Med) are more stable.

Figure 5-21: Traffic and ATFM delay trend per FAB (2001-2007)



HORIZONTAL ROUTE EXTENSION

5.10.2 The average horizontal en-route deviation has been computed per FAB for all flights in 2007. Following the methodology described in Annex II this en-route extension has been split into three components: routing within State, State interfaces within FAB, and FAB interfaces.

5.10.3 It is recognised that depending on circumstances there can be a trade-off between route extension, capacity availability and delay.

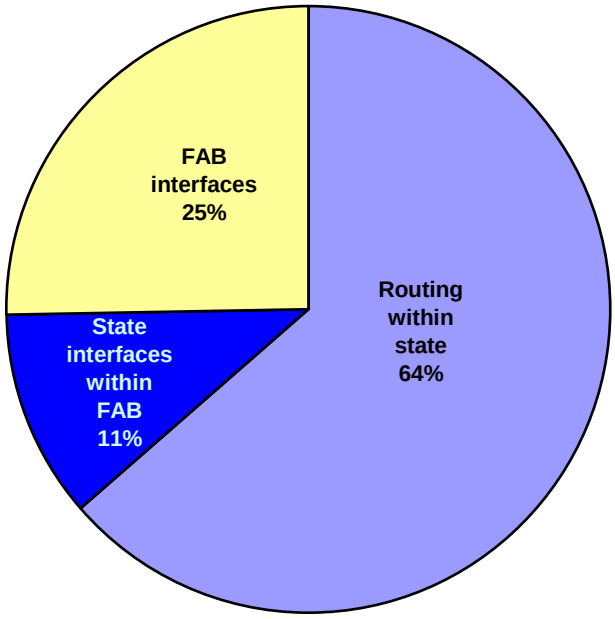
5.10.4 Figure 5-22 shows the result of this breakdown at European level. It shows that:

- 64% of en-route deviations are attributable to routing within each State;
- 11% of en-route extensions are attributable to the interfaces between States within each FAB; and
- 25% of en-route extensions are attributable of the interfaces between FABs, thus requiring action at European level.

5.10.5 It must be noted that there might be some good reasons for additional miles, mainly trade-offs between shortest mileage, optimisation of vertical movements or splitting

and reduction of conflict hotspots in certain dense areas, with a positive impact on safety and capacity.

Figure 5-22: Breakdown of additional en-route distance



5.10.6 FABs primarily address the issues of improved routing within States and between the States within the FAB; overall these account for 64% and 11% of all route extension respectively. Although the issue of routing within States could in theory be addressed without a FAB, in practice it would seem that the FAB initiatives are being used as a vehicle to address 'national' issues as well. This could be due to:

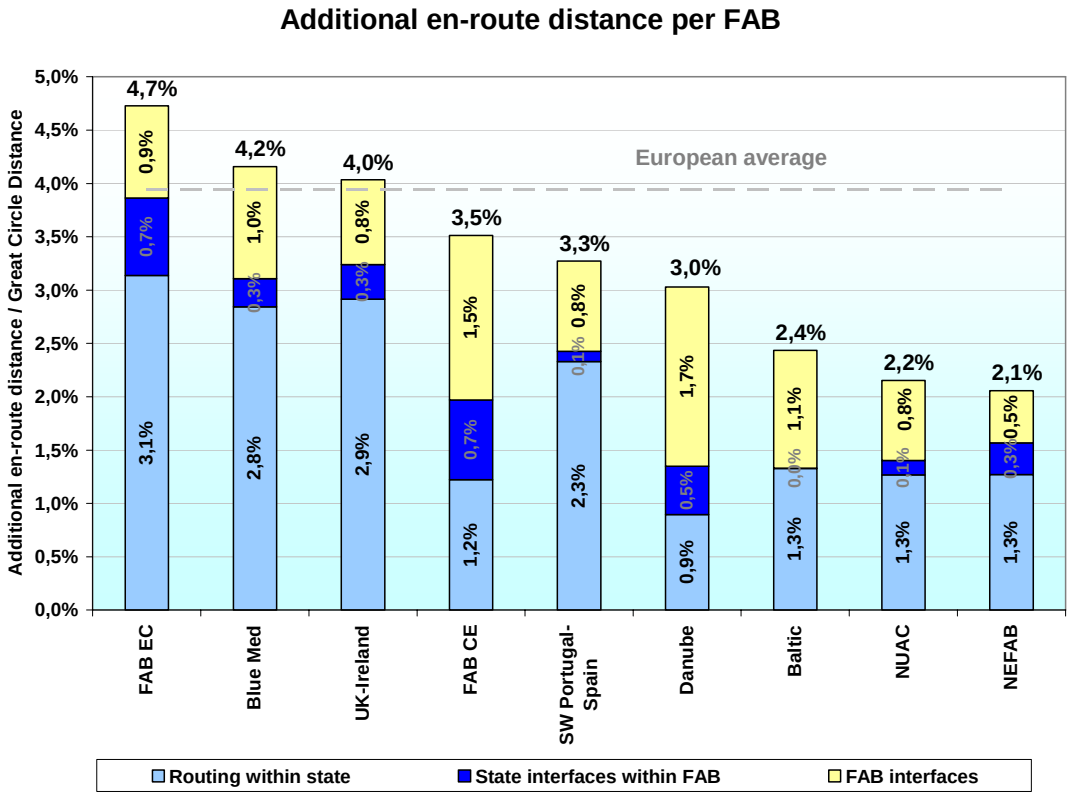
- pressure to obtain quick wins (for example, more effective civil/military cooperation); and
- a larger geographical area of airspace being available to find solutions to operational issues which are more difficult to solve at national level.

5.10.7 Figure 5-23 shows the results per FAB for the whole traffic of 2007. It is worth noting that the route extension in some FABs depends for around 50% or more from external reasons (FAB CE and Danube FAB). This is shown in the share of the yellow bars. In some others, the State interfaces within a FAB seem to be already well optimised (NUAC, SW Portugal-Spain FAB, Blue Med, NEFAB and FAB UK-IR) and the further operational benefits of a FAB are limited, at least with these proposed groupings of FIRs into FABs.

5.10.8 It must be noted that different groupings based on operational requirements, and not necessarily following national boundaries, could provide higher operational benefits, in particular with regards to interfaces between Member States, and providing a better operational optimisation.

5.10.9 In some other cases, improvements can still be achieved. In the biggest FABs (FAB EC, FAB UK-IR, SW Portugal-Spain FAB and Blue Med) the routing within State represents a significant area for potential improvements.

Figure 5-23: Additional en-route distance per FAB (2007)

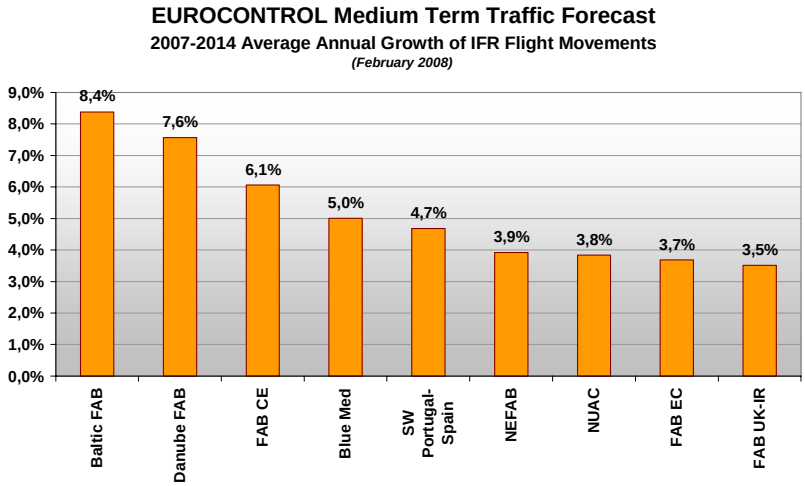


5.11 Supporting metrics

EXPECTED TRAFFIC GROWTH

5.11.1 Figure 5-24 is based on EUROCONTROL's Medium Term Forecast document dated February 2008[37]. It demonstrates a wide variation of planned annual growth depending on the FABs. Very high growth rates are projected for Baltic[38], Danube and FAB CE, with more moderate projections for NEFAB, NUAC, FAB EC and FAB UK-IR.

Figure 5-24: EUROCONTROL medium term forecasts



37 http://www.eurocontrol.int/statfor/public/standard_page/forecast_reports.html

38 In the case of the Baltic FAB around 30% of its traffic will not be reflected as it lies outside the IFPS zone

DELEGATION OF ATS SERVICE PROVISION

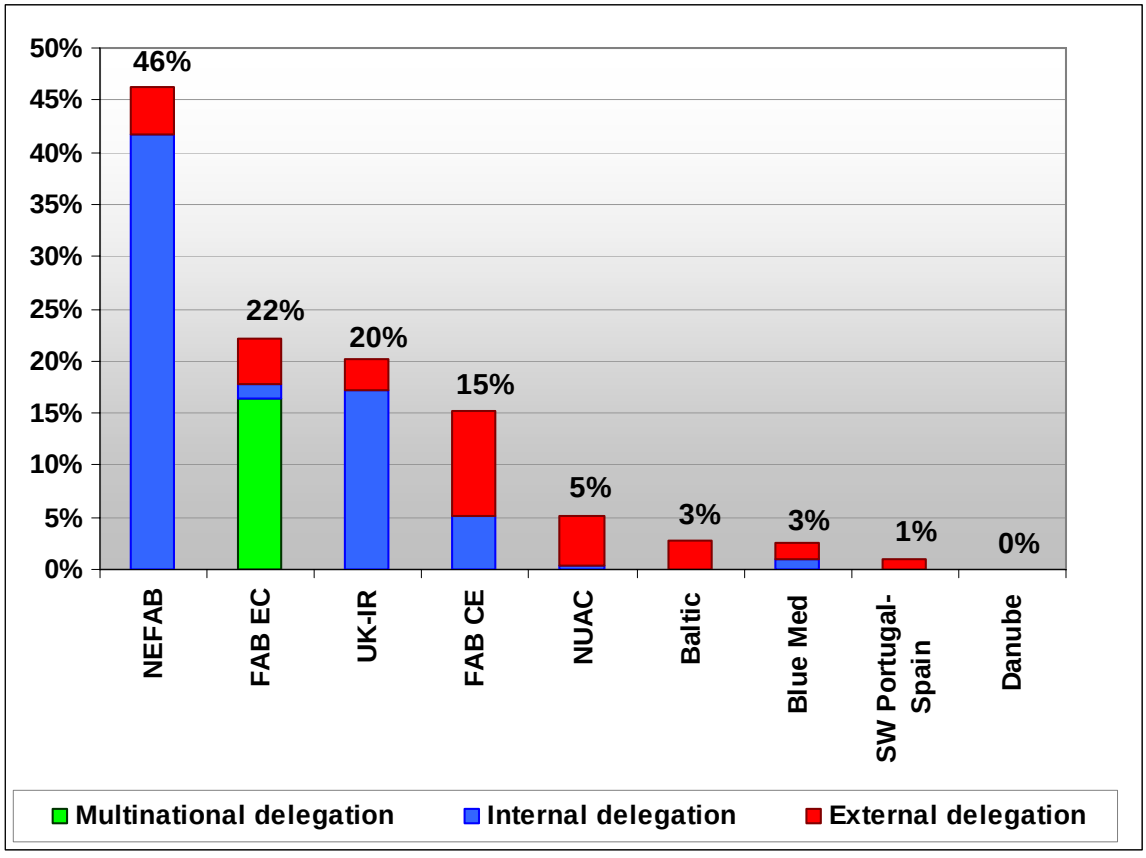
5.11.2 We have developed a measure of the amount of ATS service provision delegation in each of the FAB initiatives. Three metrics are used which show the share of airspace for which ATS is delegated. These metrics will be monitored over time to test whether FABs encourage a greater extent of ATS delegation (to support the objective of optimum airspace configuration).

5.11.3 These three metrics have been computed to measure:

- External delegation: both the delegation of ATS service provision within the FAB to a ANSP from **outside** the FAB and the delegation of ATS service provision from an ANSP of the FAB **outside** the airspace of the FAB;
- Internal delegation: delegation of ATS service provision **between** ANSPs of the same FAB; and
- Multinational delegation: delegation of ATS service provision to an **international** ANSP. Currently in Europe, this is the case of MUAC where upper airspace ATS service provision of parts of Netherlands, Germany, Luxembourg and Belgium is delegated to MUAC.

5.11.4 Figure 5-23 shows the results of these metrics. It shows that for four FABs (NEFAB, FAB EC, UK-IR and FAB CE) a significant amount of ATS service provision delegation already occurs. For the other five declared FABs only very limited delegation currently occurs.

Figure 5-25: ATS Delegations within the FABs



Source: PRU analysis

FLIGHT SEGMENTS SHORTER THAN 200KM WITHIN THE FAB

5.11.5 For the purpose of this study, the PRC has developed an indicator to show the share of "short" flight segments (less than 200km) which cross the borders of the FAB. All being equal, the shorter the flight segments in a given airspace, the larger the number of interfaces for the flight. This indicator will be monitored over time to test how far FABs support the objective of optimum airspace reconfiguration.

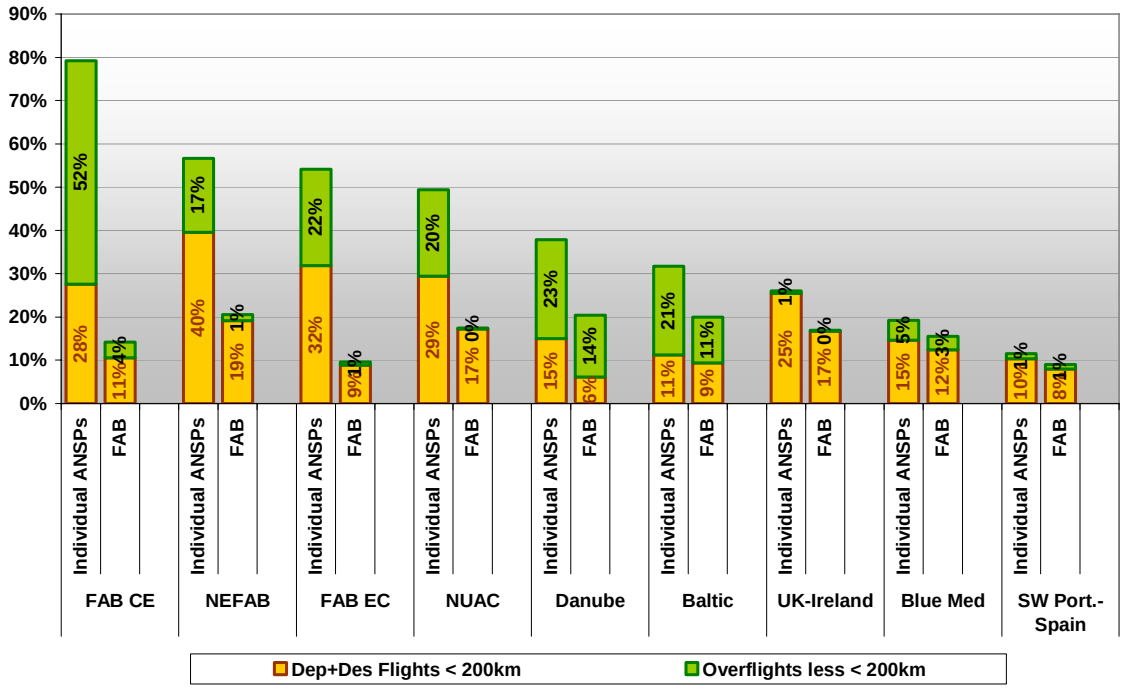
5.11.6 Based on real traffic, the share of short flight segments which cross the borders of the FAB (both international take-off and landings and over-flights) have been computed in two different ways:

5.11.7 For each individual ANSP of the FAB: Number of flight segments of less than 200km which cross the border of the airspace controlled by each ANSP divided by the number of flights within the FAB;

5.11.8 For the whole FAB: Number of flight segments of less than 200km which cross the border of the airspace controlled by the FAB divided by the number of flights within the FAB.

5.11.9 When comparing the two indicators in Figure 5-26, it appears that, as expected, the grouping of ANSPs within the FAB reduces considerably the number of "short" flight segments, both in terms of over-flights and of take-off and landings. Most of those short flight segments are therefore internalized through the creation of the FAB. This is particularly the case for FAB CE (which shows the most important reduction of short flight segments), NEFAB, FAB EC and NUAC.

Figure 5-26: Flight segments shorter than 200km within FABs



5.11.10 When considering only the FAB indicator in Figure 5-26, it appears that two FABs still have a high share of short overflights (14% for Danube and 11% for Baltic) which would suggest that the management of traffic could be improved by considering a wider geographical coverage for the FAB.

5.11.11 Figure 5-26 also shows that for three FABs at least (NEFAB, NUAC and UK-IR), the share of international take-offs and landings is important. This demonstrates that in

those FABs, the main airports are located close to the border of the FAB. Once again, the creation of the FAB, as well as cooperation with neighbouring FABs could provide an opportunity to mitigate this.

5.11.12 Finally, Figure 5-26 shows that, while the creation of FABs will significantly internalize the issue of short flight segments, there will still be some FABs with a large share a short flight segments (NEFAB, NUAC, Danube, Baltic, UK-Ireland). The PRC will monitor the evolution of this indicator overtime.

MILITARY FLEET

5.11.13 The PRU has developed a supporting metric to describe the size of the military fleet located in the FAB. This is an indirect measure of the density of military combat aircraft in any given FAB. The lowest value in FAB EC typifies the complexity of the civil-military interactions for the use of airspace.

Figure 5-27: Military Fleet

FAB	numbers of combat aircraft (fighters)	km² per fighters
FAB UK-IR	360	3.753
SW Portugal-Spain FAB	201	39.597
FAB EC	1053	1.724
FAB CE	104	4.192
Blue Med	622	2.685
Danube	116	3.448
Baltic FAB	78	5.333
NUAC	175	4.274
NEFAB	290	31.638

5.11.14 This measure implies that civil-military airspace co-ordination will be particularly important for the FAB EC, Blue Med and Danube FABs.

5.12 Supporting qualitative metrics

A DESCRIPTION OF THE CURRENT EN-ROUTE OPERATIONAL CONCEPT

5.12.1 A brief description of the current en-route operational concept of the ANSPs in each FAB is provided in Chapter 0.

APPLICATION OF THE FLEXIBLE USE OF AIRSPACE REGULATION

5.12.2 In Annex II, which describes the performance framework we set out the qualitative assessment framework for compliance with the Flexible Use of Airspace (FUA) requirements at each of the levels:

- Level 1: Strategic airspace management;
- Level 2: Pre-tactical airspace management; and
- Level 3: Tactical airspace management.

5.12.3 For each of the FABs, we asked questions about their plans for FUA and how they interacted with their respective FAB initiatives, and the timing of the expected changes. In the table below, we summarise the information collected from the five FABs who have provided us with information.

Figure 5-28: FUA compliance by FAB

Measures in place	UK-Ireland	FAB EC	FAB CE	BLUE MED	Baltic	NUAC
Level 1: FUA	It is a Key Focus Area to: extend cross border co-operation on FUA with a view to managing Military airspace in a manner that would provide more efficient routing options for commercial transport by 2010. Increased co-operation at State FUA Level 1 in terms of setting FUA policy to be applied within FAB	Key element of the FAB is the development of a common operational procedure. As part of this airspace will be designed regardless of national boundaries to fulfil civil and military requirements. 2013	Development of Military advanced concept of operations Based on enhanced application of the FUA concept Phased enhanced co-operation beginning in 2009	Complete harmonisation 2012	Formalised cross border co-operation based on renewed LoAs. There are no military zones in Lithuania. Implementation after 2012	All measures to be introduced. Implementation to commence in 2009 and be completed during 2011
Level 2: FUA	Lead AMC concept already exists. Intention is to build on the existing arrangements to enhance co-operation	2013	Lead AMCs will look to support the management of cross border airspace structures and/or operations. If possible, a FAB AMC will be created to cover both major AMC functions and FMP functions which focus on sector configuration adjustments 2012-15	Complete harmonisation 2012	Closer institutional co-operation is planned but the business case will be known after the feasibility study not implemented till after 2012	All measures to be introduced. Implementation to commence in 2009 and be completed during 2011
Level 3: FUA	Not yet defined	Key element of the FAB is the development of a common operation concepts 2013	Subject to the Implementation Plan development	Complete harmonisation 2015	CBAs are going to be developed, covering the necessary interfaces between FABs implementation after 2012	All measures to be introduced. Implementation to commence in 2009 and be completed during 2011

5.12.4 All of the FABs who have responded are working towards staged harmonisation over the period 2009 – 2013.

AIRSPACE DESIGN PROCESS

5.12.5 Within the FAB dossiers we asked questions regarding the airspace design process, comprising a description of the approach to airspace design and capacity planning one year or more before operations.

5.12.6 In Figure 5-29 we set out the answers we have received to the questions raised in the FAB dossiers.

Figure 5-29: Airspace design process

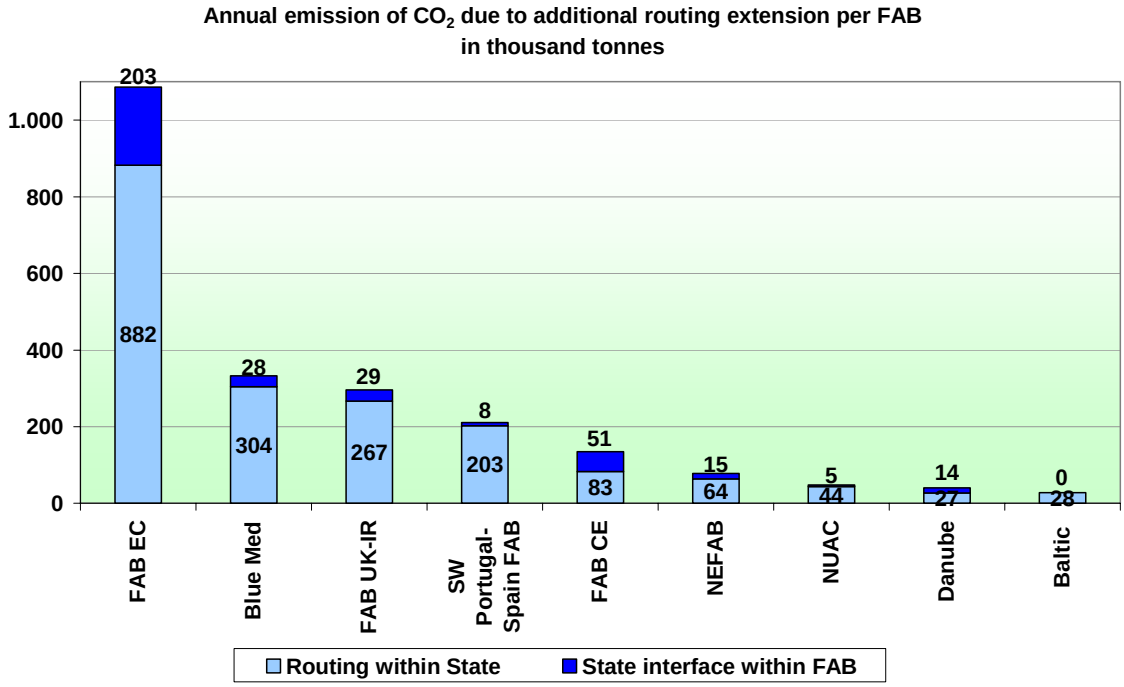
Description	UK-Ireland	FAB EC	Danube	FAB CE	BLUE MED	Baltic	NUAC
Harmonisation of airspace classification below FL 195 within FAB	No – there are as of yet no plans to do this	No comment	Yes, by 2012	Will follow pan-European process	Yet to be decided, by 2012	Action already completed (ECIP/LCIP, AOM14). Further actions depend on SES II. Change expected in 2009/10	All Danish and Swedish airspace will be harmonised within the FAB, commences 2009, completed 2011
Decision making process to optimise sector structure with the FAB	Airspace design to remain responsibility of States, through the processes agreed by the FAB management board (Airspace Working Group) and respective ANSP governance 2008	No comment	The decision making process to optimise the sector structure will be at FAB level with a single unit responsible for sector and route design.	A Joint Civil-Military Airspace Coordination Body (JCMACB) responsible for co-ordinating airspace design and ASM policies will be established Airspace design decisions to remain responsibility of States End 2009	Regional airspace design cell is expected to manage airspace design at FAB level, by 2012	FAB/ ANSPs level based on the LoAs / MoUs. Implemented after 2012	The decision making process regarding sector structure will be at FAB (NUAC) and State level, 2010-11
Decision making process to optimised route structure and military training areas within the FAB	Approval of airspace design proposals to remain responsibility of States	Airspace design to remain responsibility of States	The route structure optimisation will be at FAB level. Military training areas optimisation will be at State level, only the CBA's being subject to a FAB level decision.	JCMACB responsible for co-ordinating airspace design and ASM policies will be established Airspace design to remain responsibility of States End 2009	Regional airspace design cell will interface with a joint CIV-MIL FAB cells, by 2012	Assessment no requirement	The decision making process regarding sector structure will be at FAB (NUAC) and State level, 2010-11
Involvement of stakeholders in airspace design process within the	Both airlines and the military are represented on the FAB	Stakeholder have been consulted, however it is unclear the	Stakeholders will be invited to participate in public	ANSPs and Military users involved with JCMACB. ATCOs	To be agreed with stakeholders during Definition	National consultation process at level of the Committee for	Key stakeholders will be directly involved in the airspace

Description	UK-Ireland	FAB EC	Danube	FAB CE	BLUE MED	Baltic	NUAC
FAB	Management Board 2008	degree that their views have influenced airspace design	consultations / forums.	involved in validation. Civil airspace users involved through pan-European processes End 2009	Phase, by 2012	Airspace Management. Other actions controlled at ECTRL / ICAO level	design process, including a joint civil/military design team, 2009-10
Measures for co-ordinating the capacity planning within the FAB	No information available at this stage	No information available at this stage	The decision making process regarding the coordination on long term of capacity planning will be at FAB level from 2012.	JC-MACB will: • Contribute to NOP • Demand / Capacity balancing • AoR modification • Route improvement / CDR definition End 2009	Regional airspace design cell is expected to manage airspace design at FAB level, by 2012	Implemented after 2012	The long term capacity planning will be handled mainly in the same way as airspace design and optimisation, i.e. primarily at FAB (NUAC) level with only one airspace management cell. There will be some involvement from the State. 2010-11
Involvement of stakeholders in capacity planning process within the FAB	No information available at this stage	No information available at this stage	To some extent, the ANSPs will organize public debates on this matter.	Through pan-European processes	To be agreed during Definition Phase, by 2012	Follow gate to gate concept covering the FUA, CDM. To be implemented after 2012	Key stakeholders will be directly involved in the process (as for the airspace design process). 2010-11

5.13 Environmental performance

5.13.1 Based on an average value of kg of CO_2 per Nm calculated by the PRC over the whole traffic of 2007, it has been possible to roughly quantify the emission of CO_2 due to additional routing extension within each FAB by using both the routing extension within States and the interface between States within the FAB as calculated in section 5.10.2 and Figure 5-23). The result is shown in Figure 5-30.

Figure 5-30: Annual emission of CO_2 due to additional routing extension per FAB



5.13.2 The remaining 25% of routing extension which are due to FAB interfaces represents 732 thousand tonnes of CO_2 per year, using the same methodology.

5.14 Technical efficiency

5.14.1 Using a qualitative framework, we asked the FABs questions about their technical efficiency and the impact of the FAB in changing these systems. The results of these questions are reported below. A number of FABs were unable to provide information on these metrics. For NUAC these changes are being delivered by the COOPANS programme. This information is shown in Figure 5-31.

Figure 5-31: Technical efficiency measures - responses

FAB	System	Impact of the FAB						System manufacturer(s) [39]	Version	Key dates in integration system plan
		Specification	Procurement	Development	Training	Maintenance	Operations			
UK-Ireland	FDP							Indra (iTECH) (UK) Thales (through COOPANS) (IAA)		Not planned
	RDP									Not planned
	HMI interface									Not planned
	Voice-Communication Switching. System									Not planned
FAB EC	FDP	2008-11	2012-16			2016	2020	France: Thales/ Capgemeni/ EADS-Astrium Germany: Raytheon-Indra/other Belgium: Thales Luxembourg: SELES Netherlands: Raytheon-Indra Switzerland: Skysoft, Comsoft, Frequentis		
	RDP						2016			
	HMI interface						2020			
	Voice-Communication Switching. system	2008	2013			2015	2020			
FAB CE	FDP									2012-2017/21
	RDP									2012-2017/21
	HMI interface									2012-2017/21
	Voice-Communication Switching. system									2012-2017/21
Baltic	FDP	2006	2006	2006	2006					All inputs concerning OLDI exchange
	RDP									
	HMI interface									
	Voice-Communication Switching. system	2006	2006	2006	2006					

39 Source: PRC ATM Fragmentation Study

FAB	System	Impact of the FAB						System manufacturer(s) [40]	Version	Key dates in integration system plan
		Specification	Procurement	Development	Training	Maintenance	Operations			
Blue Med	FDP	2012	2012	2012	2012	2015	2015			Phased
	RDP									Phased
	HMI interface									Phased
	Voice-Communication Switching. system									Phased
Danube	FDP							CELEX		No specific action for FAB implementation Similar FDP systems support enhanced interoperability
	RDP							ARTAS/SELEX		No specific action for FAB implementation Interoperability based on ARTAS functionalities
	HMI interface							SELEX		No specific action for FAB implementation
	Voice-Communication Switching. system							SELEX		No specific action for FAB implementation

5.15 Conclusions

5.15.1 This chapter provides the current values of the KPIs and supporting metrics that the PRC has identified to monitor during FAB implementation. It aims to provide an illustration of the measures the PRC will monitor on a FAB rather than ANSP basis.

5.15.2 The overall performance framework, and approach to monitoring the progress of FABs over time is described in detail in Annex II.

40 Source: PRC ATM Fragmentation Study

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6 REVIEW OF BEST PRACTICES

6.1 Introduction

6.1.1 This chapter sets out our review of best practice in key stages of the implementation of FAB initiatives. We discuss the following areas:

- Safety Case (as required by Article 5(2)(a) of the Airspace regulation); and
- Cost Benefit Analysis (as required by Article 5(2)(c) of the Airspace regulation).

6.2 Safety cases

INTRODUCTION

6.2.1 Article 5(2) of the Airspace Regulation 551/2004 sets out seven requirements that must be met in order to establish a FAB. This first of these is that it must be supported by a safety case. This section reviews the progress made by each of the FABs in establishing such a safety case.

6.2.2 It should be remembered that a safety case is a method of providing evidence that a known state of a system and associated operations meets its safety requirements and, in particular, providing safety assurance on any changes to the current situation.

6.2.3 First, in line with good practice, for example as promulgated in EUROCONTROL guidance material, the safety case should be built progressively as the FAB concept develops. The safety case is therefore a **live document** and it should not be expected that the finalised safety case for any FAB is available until shortly before the FAB becomes operational. However, it would be expected that each FAB would be producing the safety case building blocks (risk assessment, hazard analysis, etc) at each stage of the FAB development.

6.2.4 Second, the safety case is one element of the basket of evidence that the ANSPs will have to present to their NSAs in order to obtain the appropriate approvals for the FAB. As a risk mitigation, it is good practice to ensure that the regulator is an integral, but independent, part of the safety case development: that s/he is informed of and, where possible, given the opportunity to review safety material as it is developed. This serves the main purpose of ensuring that there are no surprises during the final approvals process and reduces the risk that approval will not be given.

6.2.5 In the remainder of this section we outline the progress made towards developing a FAB safety case for each of the FABs.

6.2.6 Figure 6-1 below summarises the status of the safety assessment analysis being produced by each FAB initiative.

Figure 6-1: Safety case/ assessment produced by each FAB

FAB initiative	Status	FAB initiative	Status
Baltic FAB	Not developed yet	NEFAB	Not developed yet
Blue Med	Feasibility Study	NUAC	Not developed yet
Danube FAB	Safety WG/ stakeholder presentation	SW Portugal-Spain	Not developed yet
FAB Central Europe	Feasibility study safety assessment	FAB UK-IR	Assessment for feasibility, approach to implementation clear
FAB Europe Central	Feasibility Study		

UK-IRELAND

6.2.7 Safety plays a key role in the governance of the UK-Ireland FAB through the existence of the Safety WG reporting to the FAB Management Board. This Safety WG is tasked, in the short-term, with undertaking a safety review that will inform the development of a Strategic Plan for Safety.

6.2.8 The strategy for FAB safety assurance comprises three main steps:

- activities to provide assurance of the "no change" baseline focussed on review of the safety case situation in each of the ANSPs, a safety audit (focussed on operational interfaces) and a due diligence assessment of each ANSPs SMS. This involved a joint Audit Team, a number of site visits to undertake the Unit Audits and recommendations made for improvements. This activity has been completed and has resulted in a statement of safety assurance for the no change situation, presented jointly to the CEOs of the ANSPs by the relevant safety personnel from NATS and the IAA
- a detailed safety review, development and agreement with the NSAs of an integrated change control procedure and the development of proposals for changes. This step comprises several sub-steps:
  - development of guiding principles, including the application of just culture;
  - detailed safety review to be complete within 12 months of the FAB's establishment and to include opportunities for convergence of the ANSPs' SMSs;
  - development of a strategic plan for safety, including SMS convergence and change control procedures in agreement with the NSAs;
- production of safety case assurance for the implementation of proposed FAB changes.

6.2.9 Proposals to NSAs will be made on a joint basis and NSAs appear to be included in the process to the appropriate degree.

FAB EC

6.2.10 The FAB EC Feasibility Study dealt with safety through a dedicated Safety WG which delivered:

- a safety feasibility study, that included definition of the safety assessment methodology, hazard identification and definition of mitigations;
- a validation of the safety feasibility study; and
- a blue print for the FAB EC SMS implementation plan, based on a study of the similarities and differences in the SMSs of the FAB partners.

6.2.11 The FAB EC Feasibility Study reported that a full safety case was not possible or required at the feasibility stage of the FAB EC assessment, and therefore a 'safety feasibility indication' was delivered for the Feasibility Study:

6.2.12 The approach used EUROCONTROL's Safety Assessment Methodology (SAM) for Air Navigation Services. For the 15 main operational changes planned for FAB EC the main hazards were identified and potential mitigations discussed. A second iteration was based on the FAB EC common operational concept, where key risks, related incidents and potential accidents were identified.

6.2.13 In most cases, issues identified could be mitigated. However for five areas there remain further remedies that need to be developed for:

- Communication and surveillance problems with UAVs;
- Autonomous aircraft operations;
- Communication problems regarding dynamic sectorization;
- Interception of civil aircraft with communication failure by military jets;
- Emergency descents.

6.2.14 Further work will need to be undertaken to address these issues as the FAB develops its final safety case.

FAB CE

6.2.15 Similarly, FAB CE established a Safety WG to assess the FAB issues in the safety domain. The FAB acknowledges that at this stage it is only possible to highlight hazards and mitigations as driven by the current concepts of operations, and that these will necessarily evolve as the project progresses. However, bearing this in mind, the Safety WG has undertaken a feasibility study safety case, hazard analysis and proposed mitigations. The main conclusions are that there are no insurmountable safety barriers to the implementation of the FAB but that further safety assessments must be performed at each stage of the project.

BLUE MED

6.2.16 Blue Med has a work area dedicated to safety and a team dedicated to this work led by EUROCONTROL. The objective of the safety work in the current stage of the Blue Med project is to formulate a safety plan comprising a number of activities to produce evidence to support safety arguments that the concept will be acceptable from a safety perspective. The safety plan specifies:

- the safety assurance activities that will be needed to support the development of the safety case;
- the methodology and resources needed to do this;
- the responsibilities and accountabilities;
- relationships and dependencies; and
- schedule and milestones.

6.2.17 There is mention of independent review by NSAs.

DANUBE

6.2.18 Danube established a safety and security WG (with a similar structure to FAB EC and FAB CE) to address, inter alia, safety issues. The safety WG has delivered:

- A Functional (safety) Hazard Assessment (FHA), building on work already done in the safety, operational and technical areas. The FHA is the first step in the safety assessment process described in the SAM. The FHA identifies 30 potential hazard areas and categorises these by severity.
- A Preliminary System Safety Assessment (PSSA).

6.2.19 On the basis of the FHA and the PSSA, a Pre-Implementation Safety Case (PISC) has been developed. This concludes that the establishment of the DANUBE FAB is acceptably safe. However, it is noted that the PISC will need to be updated following more detailed development of the FAB concept.

6.2.20 The WG addressing legal issues has also reached some conclusions relevant to safety, recommending:

- establishment of a WG on certification and designation;
- a letter of agreement between ATSA and ROMATSA to act jointly on a range of issues including safety and security;
- amendments to national legislation to, inter alia, institutionalise cooperation between Ministries, NSAs and ANSPs; and
- establishment of an international agreement to create the Danube FAB, including the potential for a joint regulatory body to ensure cross-border coordination in certification, licensing and oversight.

OTHER FABS

6.2.21 The other FABs (SW Portugal-Spain, Baltic and NUAC) have not made material available to report on their progress in the safety domain. NEFAB has limited mention of safety (in the context of contingency) in the North European En-route Optimisation Work Group (NEEOP) final report. Baltic FAB foresee no difficulties in this area as SMS at ANSP level and safety oversight at the CAA level is already using common approaches and principles across the two ANSPs.

COMMON THEMES

6.2.22 There are a number of common themes to the approach that the FABs are taking when addressing safety, in particular:

- organisational and work breakdown structures, where there is a WG and work area dedicated to safety;
- acknowledgement that development of the FAB safety case will be a planned, evolutionary process with milestones in concert with the other project milestones;
- application of the EUROCONTROL process to safety assessment, based on FHA and subsequent identification of mitigations;
- convergence and harmonisation of the SMSs of the participants with, in the extreme, the potential to transition to a single SMS.

6.2.23 There are some other themes, however, that occur in some FABs and not others (as defined in the available documentation), that could be viewed as good practice:

- inclusion of the NSAs in the process to the appropriate degree to facilitate the approvals process;
- joint and simultaneous approaches, e.g. to certification; and
- a published, explicit basis of the safety regime on just culture.

6.2.24 At this stage, the PRC considers that it is too early to assess best practice in safety case development, as primarily the work to date has involved safety assessment during the feasibility studies.

6.2.25 Some of these common themes such as safety issues related to dynamic sectorization and UAV might be best addressed at European level to avoid duplication of effort and multiple solutions.

6.3 Cost benefit analysis

STATUS OF THE COST-BENEFIT ANALYSIS (CBA) PRODUCED BY EACH FAB

6.3.1 At 25 September 2008, the final version of the CBA had been provided by:

- FAB Europe Central (still provisional until November 2008);
- FAB Central Europe; and
- Danube.

6.3.2 For the UK Ireland FAB, the CBA is an indicative assessment of the gains that might be achieved through further co-operation between the UK and Ireland ANSPs. It builds on the earlier work undertaken during pre-feasibility, but has not been fully reworked as business cases will be produced for each initiative during the implementation phase.

6.3.3 In addition, we reviewed the Blue Med High Level Economic Assessment, but this is not intended to be a formal CBA, as this will be produced at a later stage prior to a final decision being made by the States. We also reviewed the CBA for the NUAC Programme. This was acknowledged by FAB project managers to have some limitations and an updated version was under development. However, this was not available at the time this report was finalised.

6.3.4 Most of the CBAs provided by FABs formed a part of their Feasibility study outputs, usually forming a key chapter of the main document.

6.3.5 We did not have any CBA for the other three FAB initiatives because no CBA had been developed at the time our report was drafted.

6.3.6 Figure 6-2 summarises the status of the CBAs being produced by each FAB initiative.

Figure 6-2: Cost benefit analysis produced by each FAB

FAB initiative	Status	FAB initiative	Status
Baltic FAB	Not developed yet	NEFAB	Not developed yet
Blue Med	High Level Economic Appraisal reviewed	NUAC	CBA reviewed, results of update provided from FAB
Danube FAB	Business case in Feasibility Report	SW Portugal-Spain	Not developed yet
FAB Central Europe	CBA reviewed	FAB UK-IR	Initial CBA reviewed
FAB Europe Central	CBA reviewed		

GUIDANCE ON COST BENEFIT ANALYSIS

6.3.7 In considering best practice in the development of Business case/CBA, we have also taken into account:

- European Commission "impact assessment guidelines" SEC(2005)791;
- EUROCONTROL guidance on economic appraisal of EATMP projects; and
- the standard EUROCONTROL process for CBA (EMOSIA).

6.3.8 No formal comparison of methodologies could be carried out. However the EC has adopted a common assessment framework ("Impact Assessment") to cover all previously separated assessment and evaluation techniques under a common approach and has issued Guidelines (SEC (2005)791). The Impact Assessment framework has been well tested in particular in cross-domain areas. It structures the evaluation, and provides an aid to decision-making, including on qualitative and quantitative impacts but also cost and benefits. This common assessment framework is followed in particular for any development (e.g. implementing rules) within the

Single European Sky and is also recommended for SESAR. The guidance sets out the following key stages which should be covered including stakeholder consultation throughout the process:

- **Identify the problem to solve:** The need for a project should be identified. In the case of FABs, the purpose of introduction of FABs is relatively clearly established in the SES Regulations, although as it is a requirement of the Regulations, it is assumed that there is a need for a FAB in all cases.
- **Define the objectives.**
- **Identify the main options:** A do-nothing case (reference case) and do-minimum case (minimum cost approach to meeting the need) should be developed, as well as the with-project scenario. The disbenefits of the do nothing option should be identified.
- **Analyse impacts of options:** for the main areas such as Safety, Cost-Efficiency, Flight-Efficiency, Environment (Economic/Social/Environmental).
- **Compare the options:** Includes detailed investigation of costs and benefits, investigation of least cost approaches to each option; preparation of cash flows for each option including a timescale for investment and benefits; and use of discounted cash flow analysis to compare options.
- **Outline monitoring and evaluation process from the outset.**

6.3.9 The guidance is also helpful in identifying the costs and benefits that should be included in the analysis. The following costs should be included:

- investment costs;
- operating costs, including staff, operations (maintenance, materials, supplies etc) and overheads; and
- transition costs (for example where it is necessary to maintain two systems or organisational structures in parallel for a certain period).

6.3.10 In addition, EUROCONTROL provides guidance on standard values to be used in CBA. These values are based on economic studies undertaken by a number of different organisations (mostly these are not EUROCONTROL studies) and cover many of the key variables that have been used in the FAB CBAs. However, in some cases a number of different values are included without any recommendation as to which is the most appropriate. Key values which are particularly relevant to FABs are shown in the Figure 6-3 below.

Figure 6-3: Recommended values for use in CBAs

Item	Recommended value (2006 price level)
Airline costs of delay per minute	€22-39 (ground) / €40-54 (airborne)
Aircraft operating costs per hour	Aircraft type specific (€2,811 for an A320)
Passenger value of time	€40-52/hour
Value of avoided fatality	Up to €2.5 million
Discount rate	8%
Value of a tonne of CO_2	€33-92 (central case values)
Traffic growth	STATFOR

6.3.11 More general guidance and practices, which have been tried and tested for a number of years are found in the European Commission's impact assessment framework. This qualitative and quantitative framework has been used to facilitate decision making across a number of industries.

REVIEW OF THE COST BENEFIT ANALYSIS OF THE FABS

6.3.12 The PRC has reviewed the six CBAs that were provided, using a consistent framework to facilitate comparison as shown in Figure 6-4 below.

Figure 6-4: Framework for review of CBAs

Area	Questions we sought to answer
Scope of CBA Business Case	• Which direct and indirect costs and benefits are included? • Which stakeholders are covered (eg. ANSPs, users, states and passengers?)
Key global assumptions	• What time period is the estimate made over? • What discount rate is used? • What values are used for key inputs (eg. price of CO_2)?
The reference case	• Is a reference (without FAB) case being developed? • What assumptions is this based on? • What data sources are used for this (eg. ACE)?
Key drivers of change, milestones and deliverables	• Summary of key assumptions used to transform the 'without FAB' case into the 'with FAB' case, such as timescales, nature/description of deliverable, and benefits/outputs of the FAB
Financial summary	• Costs and benefits of the FAB by year • Net present value, rate of return, and identification of date of NPV pay back • Identification of key risks associated with the FAB

6.3.13 The PRC's evaluation of each of the CBAs using these criteria is provided in Figure 6-5.

Figure 6-5: Summary of assessment of CBAs

Area		Danube	NUAC	FAB CE	FAB EC	Blue Med	UK-Ireland
Scope of CBA / business case	Costs and investments	Total figures for operational, technical and AIS/MET investments, project management organisation costs, and operational, technical and AIS/MET costs, but no breakdown	Investment costs including IT, training, and establishment of new corporation included. Costs incurred by States and airlines not included.	Investment costs and operating costs incurred by ANSP, and some State costs, included; but no costs incurred by airlines.	Transition costs and operating costs incurred by the ANSPs implementing the FAB, but no costs incurred by the States or the airlines.	No detailed breakdown by stakeholder provided so not clear exactly which costs are included	Costs of FAB Management Board included, but no costs of implementation of the initiatives.
	Benefits	Benefits to airspace users (direct operating costs), society (emissions) and passengers (flight time savings) included, but no impact on delay or safety (as no impact expected).	Benefits to ANSPs, airspace users (direct operating costs), society (emissions) and passengers (flight time savings) included, but not impacts on delay or safety (as no impact expected).	Savings for ANSPs and airlines (from change in delay and flight efficiency) included, but not passenger time savings, safety or emissions costs.	Direct savings to ANSPs (including training and qualification costs, CNS costs, technical operating costs, common ATM systems, ATCO savings, and savings in ancillary costs) Direct benefits to users from more direct routings and reduced delays. Not clear if passenger time savings or emissions costs are included. Assumed to be zero impact on safety.	No detailed breakdown by stakeholder provided so not clear exactly which costs are included in economic appraisal. However, report covers direct ANSP costs, flight efficiency and safety.	Potential fuel savings, delay savings, CO_2 emissions savings and CNS systems savings included. However, no other savings.
Values for key variables	Real discount rate	Not specified	5%	4%	6%	8%	No discounting used
	Value of time (€)		€13.20 (leisure) €21.33 (business)	Not quantified	Not specified	Just assessed with time and percentage changes	Not specified

	CO_2/tonne (€)	56	55.60	Not quantified	Not specified	22.00	Not specified
	Delay minute (€)	Not specified	Not included	57	57 (based on assumption of €76 if delay >15 minutes and €0 otherwise).	Just assessed with time and percentage changes	53

Area	Danube	NUAC	FAB CE	FAB EC	Blue Med	UK-Ireland
Reference case	Reference case appears to be the current situation, but assumptions not clear.	Reference case is the current situation, except with higher traffic levels over time.	A detailed reference case has been developed covering traffic, capacity, ATCOs, delays, flight efficiency, investment and operating costs. On the basis of this, reference case performance indicators have also been developed.	A detailed reference case has been developed, covering traffic, capacity, ATCOs, delays, flight efficiency and operating costs. On the basis of this, reference case performance indicators have also been developed.	Baseline scenario covers costs, number of ATCOs, demand and capacity. Includes SESAR and other planned initiatives such LCIP.	The Helios Initial Business Case developed a "baseline", this has not to our understanding been updated; incorporated existing co-operation and existing NATS and IAA plans (including ACC rationalisation) and introduction of iFACTS
Key drivers of change	Economic evaluation appears to be based on two sensitivity tests for potential distance savings, but the assumptions are not explained in detail and no justification is provided.	For evaluation of direct financial costs, a large number of initiatives planned as part of the NUAC Programme are evaluated. For the socio-economic evaluation, a simulation was undertaken of the route network for a single representative day in 2006, and this is extrapolated.	A number of operational initiatives are evaluated, which have an impact on cost, flight efficiency and delay. In addition, a number of other initiatives are evaluated which also produce financial benefits. However, the CBA is based on a number of critical assumptions – particularly, difficulties in recruiting ATCOs leading to rapidly rising delays in the reference case.	Benefits arise from three stages of improvements to airspace design: resectorisation of 'hot spots'; wider airspace reconfiguration including relocation of military areas; and introduction of tailored routes in very high airspace. Benefits are also achieved through improvements to the operational concept, improved ATM and CNS infrastructure, common	Benefits are described as resulting from higher capacity, shorter routes and (from 2015) the introduction of the virtual centre, common systems, training, CNS infrastructure. However, it is not transparent how the benefits for each of these components	A number of initiatives are listed which could be brought forward by the FAB, although the individual impacts of these initiatives are not quantified.

Area	Danube	NUAC	FAB CE	FAB EC	Blue Med	UK-Ireland
			The sensitivity analysis shows the case for the FAB is significantly weaker if these assumptions dropped, although the NPV is still positive.	training and qualifications, changes to MET and AIS provision, more cost-effective contingency plans, and a single unit rate.	are calculated.	
NPV impact (€ millions)	224-553	440-552	308-342	7,295	70-362	Not quantified for total but 12 per annum by 2012 and 40 by 2018

6.3.14 The CBA for FAB EC shows much greater benefits than any of the other CBAs. This is not surprising as the size of the FAB EC measured in terms of traffic and costs is by far the largest one (see Figure 4-3).

6.3.15 The CBA for FAB EC is the most detailed of all of the CBAs that we reviewed. It provides a clear and detailed reference case, and for each of the main initiatives proposed by the FAB, it provides an assessment of the costs and benefits based on the analysis of the FAB WGs (although in some cases it appears that it was necessary to make assumptions). A possible limitation is that the FAB EC CBA does not include any wider social benefits of the FAB and therefore may understate the benefits of the FAB.

6.3.16 The other CBAs that we have reviewed all have significant limitations. The most important issues pertaining to each CBA are:

- **NUAC Programme:** The NUAC business case documentation provides a very detailed financial assessment of the initiatives that would be undertaken as part of the FAB. However, the socio-economic analysis is more limited. The reference case is simple, assuming continuation of the current route network with no change in excess distance or delay per flight, and the analysis is based on extrapolation of a simulation of changes to the network covering one day only.
- **FAB CE:** This CBA provides a clear, detailed reference case. However, the results are dependent on a number of expert assumptions, some of which are open to question, and which have a substantial impact on the results. In particular, it is assumed that in the no-FAB scenario there is a constraint on the number of additional ATCOs that can be recruited in any one year, and delays eventually rise rapidly because it is not possible to recruit enough ATCOs to accommodate traffic. If this assumption is changed, the business case for the FAB is significantly reduced (although it is still positive). The CBA was delivered by an independent contractor taking into account data available at the time. The CBA will be revised during the preparatory phase of the FAB.
- **Blue Med:** The High Level Economic Appraisal (HLEA), which forms a section of the Feasibility study is not, and does not seek to be, a formal CBA, which will be developed at a later stage. Our main concern with the HLEA is that it is not fully clear what assumptions have been made or what costs and benefits have been taken into account. It is therefore difficult to assess whether the assumptions or results of the HLEA are reasonable. Data reported in the HLEA should be considered only as indicative as they are supported by simulations and expert judgements and not formal business cases.
- **UK-Ireland:** The CBA is an indicative assessment of the gains that might be achieved through further co-operation between the UK and Ireland ANSPs. There is no direct relationship between any specific initiatives which might be brought forward by the UK-Ireland FAB Management Board and the benefits that are projected from the FAB.
- **Danube:** The CBA is very limited, with no discussion of a reference case and no detail on the assumptions regarding financial costs and benefits. The other savings are based on two sensitivity tests for time/distance savings but without any justification being provided for the values used.

6.3.17 Some of the CBAs also omit costs and benefits which could be significant. For example:

- FAB CE and FAB EC's CBAs do not quantify emissions savings or passenger time savings;
- Apart from the CBA in FAB Cs, there is no quantification of any additional costs incurred by the States in overseeing the FAB.

6.3.18 In addition, we have identified significant differences in some of the assumptions made in the CBAs, and between the CBAs and the EUROCONTROL guidance on CBAs. For example:

- There are significant differences in the discount rates used in the CBAs, and all of the CBAs other than Blue Med use a discount rate that is lower than the EUROCONTROL recommended value;
- NUAC uses a value of passengers' time which is significantly less than the EUROCONTROL recommended value.

6.3.19 Some of the issues that we have identified are being addressed by the FABs. The NUAC Programme has developed an updated CBA which will address the discrepancies that we identified, although not our concerns about the reference case and the simple nature of the socio-economic analysis. Blue Med will produce a formal CBA at a later stage. The UK-Ireland FAB will also produce more formal business cases for the individual initiatives that will be developed by the FAB Management Board. These business cases will then be subject to review by the FAB Supervisory Committee (comprising the NSAs).

SUMMARY OF QUANTIFIED BENEFITS FROM AVAILABLE CBAS

6.3.20 As identified in the previous section, all CBAs have been organised and built around different assumptions which makes it difficult to undertake a comparison. The PRC would like to offer the following comparison based on the assumptions detailed in the following paragraphs.

6.3.21 Since most benefits identified in available CBAs refer to cost savings, improved delays and improved flight efficiency ("socio-economic" benefits are not considered here since they have only been estimated in two CBAs), the PRC has first estimated the Total Economic cost for 2006 of each FAB by summing the ATM/CNS provision costs with the cost of en-route ATFM delays and the costs of extra kilometres flown within the FABs.

6.3.22 The cost of en-route ATFM delays has been established by using a value of €77 per minute of delay, as used in the ACE 2006 report.

6.3.23 The cost of extra flown kilometres within the FAB has been calculated by multiplying the extra distance within FABs (both the extra distance within States in the FAB and the State interface within the FAB)[41] with the average cost of one kilometre flown (€4,94 /km as used in PRR 2007).

6.3.24 The detail of the calculation of the Total Economic cost for each FAB in 2006 is detailed in Figure 6-6.

41 For more details, see paragraph 5.10.2 and Annex II.

Figure 6-6: Calculation of Total Economic cost per FAB (2006)

FAB	ATM/CNS costs (2006)	*en-route ATFM delays > 15 min. ('000 minutes) (2006)*	Financial value of en-route ATFM delays	*Extra flown km within FAB*	Financial value of extra flown km	Total Economic cost (2006)
Blue Med	857 M€	*641*	49 M€	*33.214.729*	164 M€	**1.070 M€**
Danube	219 M€	*0*	0 M€	*4.081.613*	20 M€	**239 M€**
FAB CE	407 M€	*899*	69 M€	*13.418.801*	66 M€	**542 M€**
FAB EC	2.385 M€	*2.941*	226 M€	*108.459.365*	535 M€	**3.147 M€**
NUAC	221 M€	*135*	10 M€	*4.830.701*	24 M€	**255 M€**
UK-Ireland FAB	895 M€	*1.222*	94 M€	*29.602.475*	146 M€	**1.135 M€**

6.3.25 The PRC has then extracted from the various CBAs or emerging appraisals the annual net benefits expected in 2013 and 2018. These benefits include ANSP cost-savings, reduction of airline delays and improved flight efficiency. For comparison purposes, "socio-economic" costs and benefits (in particular, passenger cost saving from time savings) which have been estimated in the NUAC CBAs, have not been taken into account. This assumption under-estimates the values for this FAB. This calculation has been done per scenario when various scenarios were quantified for a FAB.

6.3.26 The net benefits expected for 2013 and 2018 have been compared to the Total Economic cost of each FAB. For most of the FABs, the annual benefits in 2018 (long term benefits) are higher than for 2013 (short/medium term) ones.

6.3.27 Figure 6-7 (columns B & C) shows that in terms of absolute values, the expected benefits from FAB EC are significantly higher than those of other FABs. It should also be noted that, in relative terms, the NUAC CBA shows significant potential benefits (around 18% of 2006 Total Economic cost as shown in columns "B / A" and "C / A"). For the other FAB initiatives, the net benefits are fairly modest.

Figure 6-7: Summary of quantified benefits from available CBAs

FAB	2006 Total Economic Costs (ATM/CNS + delay + flight efficiency costs)	Annualised net benefits for 2013 (direct + indirect excluding passenger benefits)	*% of net benefits derived from improved flight efficiency and delay*	% of 2006 Total Economic Costs	Annualised net benefits for 2018 (direct + indirect excluding passenger benefits)	*% of net benefits derived from improved flight efficiency and delay*	% of 2006 Total Economic Costs
	A	B		B / A	C		C / A
Blue Med							
Scenario min	€ 1.070 M	€ 14 M		**1%**	€ 17 M		**2%**
Scenario max		€ 49 M		**5%**	€ 71 M		**7%**
Danube							
Scenario 1,8%	€ 239 M	€ 52 M	*99%*	**22%**	€ 52 M	*99%*	**22%**
Scenario 1%		€ 29 M	*98%*	**12%**	€ 29 M	*98%*	**12%**
FAB CE							
Static		€ 6 M	*53%*	**1%**	€ 30 M	*55%*	**6%**
Dynamic (big bang)	€ 542 M	€ 6 M	*53%*	**1%**	€ 21 M	*55%*	**4%**
Dynamic (gradual)		€ 6 M	*53%*	**1%**	€ 27 M	*55%*	**5%**
FAB EC	€ 3.147 M	€ 260 M	*77%*	**8%**	€ 1.150 M	*83%*	**37%**
NUAC	€ 255 M	€ 47 M	*72%*	**18%**	€ 51 M	*81%*	**20%**
UK-Ireland FAB	€ 1.135 M	€ 12 M	*100%*	**1%**	€ 40 M	*63%*	**4%**

Note: Danube the same values are used for 2013 and 2018 as only one annual value is presented. Assumptions and expert judgments would need to be confirmed.

RECOMMENDATIONS ON BEST PRACTICE

6.3.28 The PRC recommends that each CBA should:

- Have a clear and justified reference case, to provide a realistic assessment of what is likely to occur if the FAB does **not** proceed. In order to avoid overstating the benefits of the FAB, it is important that this is based on realistic assumptions and takes into account other improvements that may be made: for example through SESAR, and other business initiatives;
- Identify precise initiatives to be implemented as a result of the FAB, and provide a business case for each of these initiatives. The business case should include detailed deliverables and timescales, and provide estimates of the benefits and the investment, transition and operating costs. The business case should also include key dates for implementation of initiatives and realisation of benefits, and set out metrics that can be monitored;
- Rely on facts and plans rather than assumptions, and provide a clear justification for assumptions used;
- Use consistent assumptions for discount rates, values of passengers' time, etc. (allowing FAB to take into account different costs of capital, mix of users etc);
- Cover the full range of stakeholders that will be affected by the FAB, including ANSPs, users, States, passengers, and wider society.

6.3.29 The PRC also recommends that the business cases for specific initiatives should be reviewed both in advance and ex-post by the NSA, in order to ensure that the initiatives are consistent with the FAB performance plan usually set out in its feasibility study.

7 FACTUAL ASSESSMENT SUMMARY, CONCLUSIONS, RECOMMENDATIONS

7.1 Introduction

7.1.1 This chapter provides factual assessments, conclusions and recommendations from the PRC's Evaluation of Functional Airspace Block initiatives at 1 July 2008. They are based on initial findings and conclusions presented in the Interim Report, a second round of visits, information update and validation with FAB representatives as required, extensive consultation of all stakeholders and PRC's independent assessment.

7.1.2 The first part presents 16 "factual assessments". These factual assessments cover the following areas:

A) Review of the nine FAB initiatives;

B) Their expected impact on performance.

7.1.3 The second part gives PRC conclusions and 22 pragmatic recommendations to reinforce the FAB initiatives in order to reduce ANS fragmentation and further improve their performance.

7.2 Summary of the PRC's factual assessment as of 1 July 2008

A) Review of the nine FAB initiatives

Factual assessment 1: Progress in some but not all FAB initiatives in first half of 2008

As indicated in the Interim Report (19 February 2008), the progress of FAB initiatives until the end of 2007 was generally disappointing and this resulted in:

- The EC Communication (COM(2008) 389/2, June 2008) and suggested amendments to the SES through the SES II package;
- Airspace users explicitly expressing their dissatisfaction with progress (as confirmed by IATA's letter to the PRC dated 25 June 2008 and comments made by airlines in the first Stakeholders Consultation meeting in October 2007).

During 2008, six FABs initiatives made substantial progress: Blue Med, Danube, FAB-CE, FAB-EC, NUAC and FAB UK-Ireland. These FAB initiatives invested significant effort and resources in feasibility studies, and in the case of UK-Ireland implementation of the FAB Management Board. During its latest round consultations, the PRC found that:

- More detailed plans, including identification of the preferred options/scenarios for the FAB and Cost Benefit Analyses were becoming available;
- Member States were becoming more involved in the process through co-operation agreements and involvement in performance target setting or objectives for the FAB;
- A number of FAB initiatives were developing innovative approaches to NSA co-operation, civil-military co-ordination, airspace users' involvement;
- Significant cooperative momentum has been created among ANSPs in some of the FABs.

In the same period, there was relatively little progress in the development of the SW Portugal-Spain FAB and the Baltic FAB.

Several Nordic ANSPs, after a pre-Feasibility Study, agreed in March 2008 to officially

launch a new FAB initiative, NEFAB. So there were in total **nine** declared FAB initiatives at 1 July 2008. These FAB initiatives are reviewed in Chapter 4 of this report.

One EU State (Latvia) and three States bound by bilateral agreements with the EU (Serbia, Montenegro, and FYROM) are due to develop FABs, but were **not** actively participating in a FAB at the same date.

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Factual assessment 2: UK-Ireland FAB officially launched, but uncertain benefits

At 1 July 2008, the UK-Ireland FAB was the first and only FAB that had been notified to the European Commission. This FAB initiative is described in detail in Section 4.11 of this report.

The UK-Ireland FAB has defined working relationships between States, NSAs and ANSPs in three Memorandums of Understanding. The FAB Management Board model relies upon airspace users being actively involved and taking a crucial role in the development of improvements for the FAB. This means that a significant responsibility is passed on to airlines and they will need to commit significant resources to fulfil this role.

As the timing and magnitude of the changes are still to be decided by the FAB Management Board, the benefits of the model are uncertain and will need to be monitored over time.

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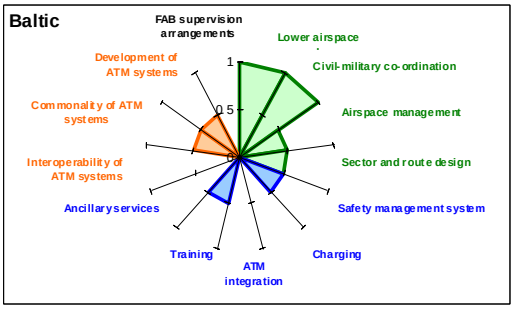
Factual assessment 3: Wide differences in scope

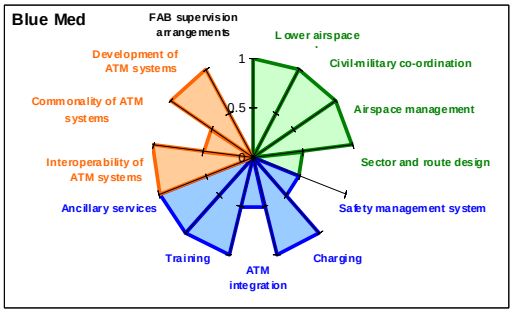
There are wide differences in the scope of changes expected from FAB initiatives as shown in Figure 7-1 below and in an analysis across FABs presented in Chapter 5.

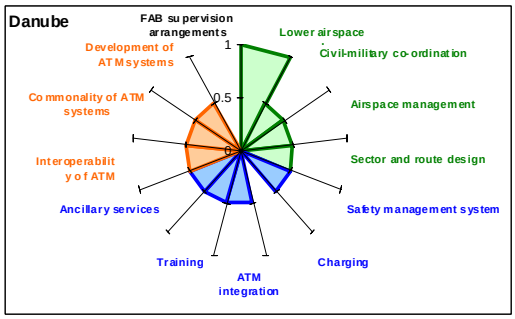
All FABs plan to cover, to some extent, the original legislative requirements of airspace and operational changes, but a number of them have extended their plans to address issues of service provision, systems, training, and Air Traffic Flow Management.

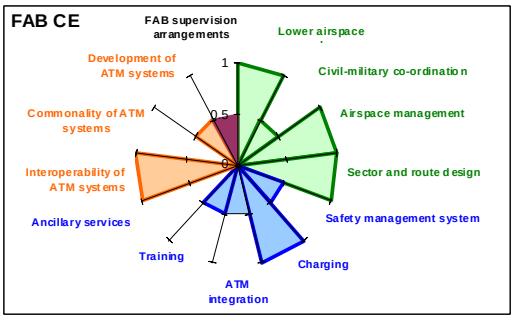
This makes sense from an organisational and change management perspective, and is in line with the definition of FABs in the SES II package issued in June 2008. However, it increases the complexity of the programme of work and potentially lengthens the time to implementation and achieving some of the benefits of the FABs. Moreover, the wider scope has sometimes reflected a lack of clear objectives from Member States.

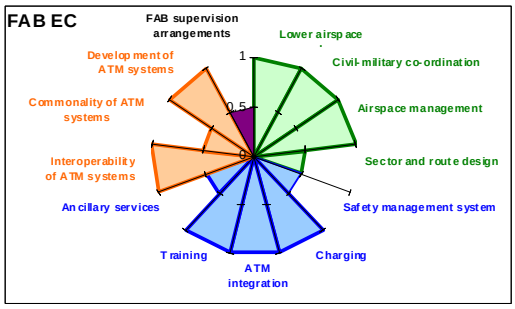
Figure 7-1: Characteristics of each FAB

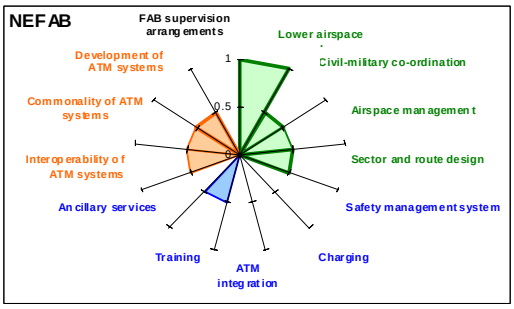


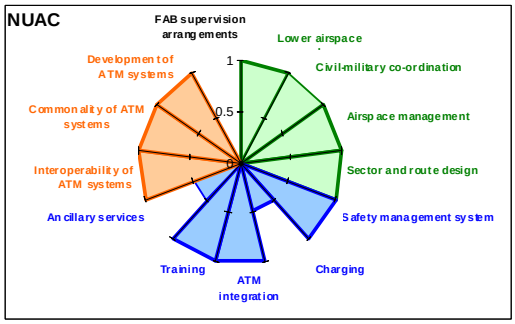


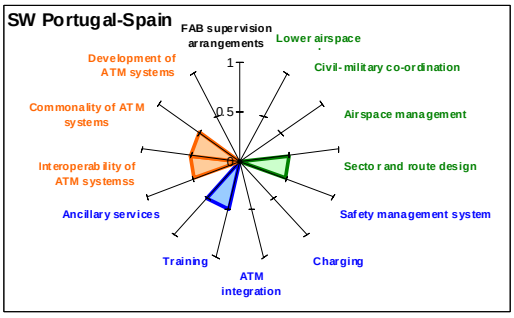


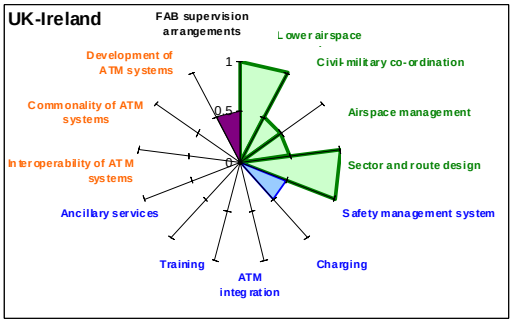












These diagrams describe the expected changes to be introduced as a result of the FAB.

The scores represent an independent assessment based on evidences provided during consultation with each FAB initiative as well as key user and staff stakeholders.

The details for each score is outlined in detail in Chapter 4 and all scores are equally valuable.

The Keys to the graphics are:

- : Airspace
- : Service Provision
- : Systems
- : Supervision

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Factual assessment 4: All but one FABs address upper and lower airspace

All FABs, except one, address both upper and lower airspace (See Figure 7-1). This is positive, as it allows greater optimisation of flows and better interaction with the TMAs. It goes beyond the current requirements of SES I and anticipates amendments proposed in the SES II package.

7.2.1 In the proposed amendments to the SES legislation, requirements concerning FABs are not limited to upper airspace.

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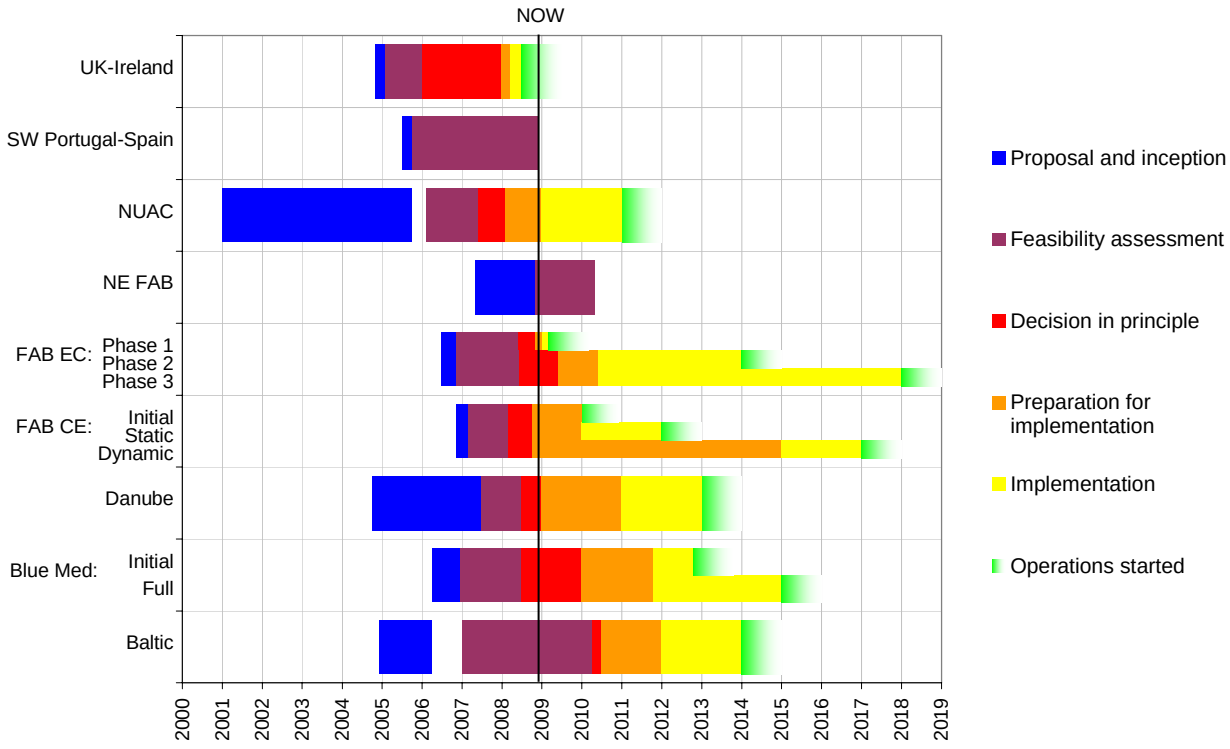
Factual assessment 5: Large differences in timescales and approaches

Large differences in timescales and deployment strategies are observed: an explicit phased approach for FAB CE and FAB EC, and an implicit phased approach for most other initiatives.

2014 is the latest target date for the start of operations of known FAB initiatives. The current planned timescales of the initiatives are reviewed in detail in Section 5.5 of this report.



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Factual assessment 6: A range of co-operation models

A number of FABs have examined, at least in a preliminary assessment, different institutional options for the FAB (UK-Ireland, NUAC, Danube, FAB EC). These have examined a range of co-operation models, including co-operation agreements, operational alliances (some joint functions) and operational/organisational mergers.

Available information, notably from NUAC, indicates prospects for greater performance improvements from the stronger co-operation arrangements.

To date, FAB initiatives have preferred co-operation agreements and operational alliances, at least as a first step. This represents a pragmatic approach even if, in some FABs, the merger option remains the long term objective.

It is interesting to note that a representative staff organisation advocates the merger scenario in the MOSAIC project.

7.2.2 FABs have the potential not only to improve flight-efficiency and related environmental impact, but also ANS direct costs through genuine business rationalisation and integration (service provision, support functions and common ATM systems/infrastructure). The analysis of some feasibility studies with different institutional options have shown that improvements in both direct and indirect ANS costs could be achieved through FABs, with the most promising benefits stemming from full merger scenarios. To date, the pragmatic approach for co-operation agreements taken by FAB initiatives is generally in line with the Co-op framework proposed by the European Transport Federation (see § 4.1.9 and Annex III).

7.2.3 In this context, it should also be noted that the staff-led initiative MOSAIC (see § 4.1.9 and Annex III) explicitly proposes a full operational and organisational merger of several ANSPs, with the creation of a (civil/military) integrated inter-State public sector ANSP in core Europe. The progressive streamlining of technical infrastructure and support functions is expected to bring significant savings (scale effect), although costs and benefits are not quantified at this stage.

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Factual assessment 7: Various level of stakeholders involvement

Airspace users, staff and military representative have been involved in the FAB feasibility in very different ways and depth.

7.2.4 The PRC has assembled statements by stakeholders on their perceived involvement in the FAB initiatives at 1 July 2008, which are summarised in Figure 7-2 below.

Figure 7-2: Perceived stakeholder involvement in FAB initiatives at 1 July 2008

FAB	Users	Staff	Military
FAB Baltic	Little involvement to date. PRC understands BANC starting to launch process (October '08)	None before FAB more mature PRC understands BANC starting to launch process (October '08)	No involvement. However, already close co-operation outside the FAB
FAB Blue Med	Users have expressed their dissatisfaction with level of involvement. Consultation meeting took place in June and intention for more involvement in next phase.	Limited consultation to date. Some consultation in June and September	Initially limited but now involved with working groups and will be involved in Definition Phase
FAB Danube	Some consultation through open stakeholder meetings, but no significant influence	Working group for social dialogue, staff perception after good start limited involvement after 2007 (to open consultation)	Limited involvement to date
FAB CE	IATA member of steering committee, Austrian on two working groups. Airlines concerned their advice not taken on board	Some involvement will be stepped up during the next phase. Staff disappointed with their level of involvement to date.	Military involved in two working groups. In future will be involved in JMACB
FAB EC	Extensive consultation with users	Some consultation, but consider it limited to information transfer	Civil/ Military working group in feasibility study
NEFAB	Minimal involvement, information exchanged	Minimal involvement, information exchanged	Minimal involvement, information exchanged
FAB NUAC	Regularly involved in co-ordination groups and contributed to the Definition phase report	Regularly involved in co-ordination groups and contributed to the Definition phase report	Regularly involved in co-ordination groups and contributed to the Definition phase report
SW Portugal-Spain FAB	Minimal involvement, information exchanged	Minimal involvement, information exchanged. Do not fully understand the development of the project	Minimal involvement, information exchanged
FAB UK-Ireland	Some involvement in feasibility phase. Key role in implementation phase with Chair of Service Provision working group of FAB Management Board	Trade unions involved. However, differences in perception of management and trade unions as to the extent of influence. TUs will at least be involved in Service Provision Working Group	Military involved with feasibility study. Representatives of the military have been appointed to the FAB Management Board.

7.2.5 As the FABs mature, greater involvement of the three key stakeholders is formalised, e.g. the Management Board in the UK-Ireland FAB, and the Joint Civil-Military Co-ordination Board in the FAB CE. In FAB EC, the civil-military co-ordination plans produced by the working group will be taken forward. However, arrangements for the involvement of Military ANSPs in the feasibility stage are still under consideration.

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Factual assessment 8: All FABs follow existing FIRs and ATS delegations

The bottom-up approach to FABs has resulted in FIR and ANSP groupings, following existing boundaries and ATS delegations, rather than operational effectiveness. Geographical necessity and alliances also played a role.

While this may be at odds with the operational logic of FABs in the SES I legislation, addressing mainly airspace fragmentation, this is consistent with FABs as defined in the

proposed SES II package, addressing the "*optimisation and integration of ANSP*".

European-wide and cross FAB airspace design and use has only been considered peripherally through existing FAB initiatives, leaving some of the most challenging interfaces unchanged. Inter-FAB European-wide airspace design should be effectively addressed at European level.

7.2.6 The existing SES I Regulation states that airspace should be reconfigured on an operational basis regardless of existing boundaries.

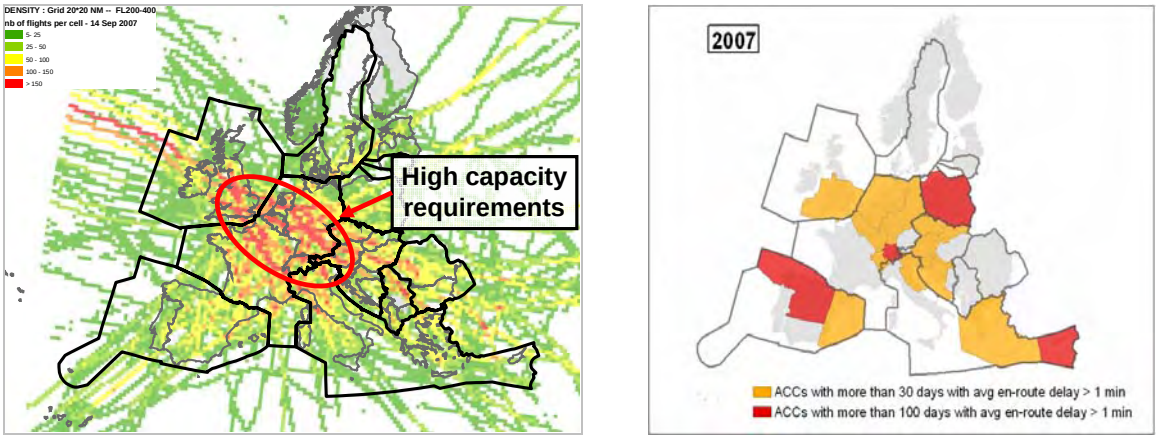
7.2.7 However, the FAB initiatives have been influenced by geography, historic political relationships and cultural commonalities. As a result of this:

- All FAB initiatives are planning to join the existing FIRs of participating Member States - there are no examples of existing FIRs being split between FABs. All boundaries between FABs will therefore be close to existing FIR boundaries, with limited delegation of service provision across FAB boundaries (which takes place anyhow, regardless of FABs).
- Some airspace reconfiguration that might have operational merit is not currently being pursued through any FAB initiative. Some of the most challenging interfaces are not being addressed within any FAB, e.g. Eastern Germany and Western Poland, North East Italy and Croatia/Montenegro.
- Some groupings are based on geographical necessity, some Member States being located at European boundaries, for example Cyprus and Greece, Portugal and Spain.

7.2.8 It should be recognised that it is not straightforward for ANSPs to participate in several FAB projects at the same time as it requires resources and adds complexity.

7.2.9 It could be argued that, as national boundaries are unlikely to be the optimal operational boundaries between FABs, this is inconsistent with the requirements of the airspace Regulation to optimise airspace design regardless of national boundaries. For example, the core area of Europe, with the highest density of civil and military traffic, spans four different FAB initiatives (left-hand-side of Figure 7-3 below). This is unlikely to be operationally optimal. On the other hand, aside from Zürich ACC in 2007, the ACCs with the highest level of delays in 2007 tend to be outside the core area (right-hand-side of Figure 7-3 below).

Figure 7-3: Core high density area



7.2.10 In fact, the objective of FABs is modified in the proposed SES II legislative package, as follows: "A FAB means an airspace block based on operational requirements and established regardless of State boundaries, where the provision of air navigation services and related ancillary functions are optimised and/or integrated".

7.2.11 FIR and ANSP groupings resulting from the bottom-up approach tend to reduce the level of fragmentation in ANS provision, which is in line with the new objective of FABs and the bottom-up approach to FABs confirmed in the proposed legislation.

7.2.12 In this case, the Europe-wide and cross-FAB airspace issues remain. Most FAB initiatives have concentrated primarily on improvements to the design of airspace within the FAB. Although some FABs are also looking at the design of airspace at the boundary with other FABs, this is generally a secondary issue.

7.2.13 Therefore, there is a risk that the current boundaries of FABs will not sufficiently improve the **connectivity** of the European network and may freeze inefficiency into it. There is a need for an adequate mechanism to ensure the Europe-wide and cross-FAB consistency of airspace design and use.

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Factual assessment 9: Cross-FAB coordination has been very limited

Cross FAB issues are only marginally addressed. There has been limited coordination across FAB initiatives. EUROCONTROL has organised Periodic Information Meetings with FAB programme managers. There are some examples of FABs working together, but this is generally limited and secondary to the main FAB work programme. An example of this is the interaction with the South East UK area, which FAB EC has identified as an area to be given special consideration when addressing airspace design.

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Factual assessment 10: Safety assessments more appropriate than Safety Cases

A number of FABs have undertaken safety assessments identifying hazards and potential mitigations which could arise as a result of the FAB initiatives. These are reviewed in detail in Chapter 6.

No Safety Cases could be developed at this stage, since they can only be performed when the FAB is fully specified operationally. SES requirements would need to be clarified accordingly, as drawing-up of a Safety Case is one of the few requirements for the creation of FABs.

Due to limited evidence, no conclusion on best practice from safety assessment / building changes to a safety case resulting from FABs can be provided.

7.2.14 This requirement probably stems from a misunderstanding of the role of a Safety Case as an evolving and “live” document supporting the operational development of an ANS organisation. The Safety Case needs to be updated for any operational change, whether driven by a FAB or any other operational need.

7.2.15 To date, only safety assessments have been conducted by FABs. In the case of the UK-Ireland FAB, it was concluded that there were no changes to the Safety Case to be introduced by the FAB Management Board. A number of safety assessments have identified potential safety risks arising from the FAB feasibility studies and suggested mitigations. However, as these have not yet been implemented, they have not led to a change in the operational Safety Cases.

7.2.16 As a result, only limited evidence is available for determining the best practice for the development of Safety Cases for changes expected as a result of FAB initiatives.

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Factual assessment 11: Identified key impediments to progress in FABs

A number of key impediments to progress in the implementation of FABs have been reported by FAB representatives and stakeholders, which have to do with operational, legal, financial and organisational matters.

7.2.17 A number of key impediments to progress in the implementation of the FAB initiatives have been reported throughout the study. The report identifies the main ones, and makes suggestions for alleviating these.

a) **"Big bang" changes are difficult**: There is an emerging view, reflected in the more mature FAB feasibility studies that implementing a "Big bang" is difficult in relation to agreement between all stakeholders. Therefore, most FABs are taking what they consider to be more practical 'small steps' to implement the FAB, often encompassing a number of different phases within their implementation programme.

b) **Loose definition of FAB requirements/ lack of guidance in SES**: The loose definition of FAB requirements in the SES legislation, and a lack of guidance and implementing rules, has led to uncertainty in terms of what needs to be implemented. The wide scope of some FABs (operational, technical, financial, human, Civil-Military) has led to much longer preparation and feasibility stages than if a narrower scope had been followed.

c) **Lack of FAB objectives from Member States**: Some FABs have been provided with clear objectives by their Member States, including deadlines and quantified performance objectives. Others have been given no or very little guidance from their States about the objectives of the FAB, leading to delay in decision making and in achieving quantifiable outputs during the feasibility studies.

d) **Lack of explicit incentives**: The current legislation and charging regime does not provide the ANSPs in a FAB with sufficient incentives to use the FAB as one of the tools to improve their performance (as measured by safety, operational and cost efficiency). Therefore, no real sense of urgency is provided through the existing FAB mechanism.

e) **Different operational concepts**: In some of the FABs, a wide range of current operational concepts and practices mean that significant changes and harmonisation will be needed to implement the FAB. In some FABs where there are currently significant differences between operational concepts (FAB EC, FAB CE and Blue Med), this is a potential cause of delay in effective implementation.

f) **Differences in governance and financial arrangements:** Some FABs have identified that different financial and ownership objectives can provide an obstacle to effective implementation. This includes differences in salaries and unit rates, treatment of VAT, shareholder objectives, value of the cost of capital, etc. This provides a real obstacle to the practical implementation of a FAB.

g) **Liability and sovereignty**: A number of FABs reported liability and sovereignty as real challenge to the introduction of the FAB. However, others tried and tested ways of resolving these issues. These could be shared and implemented across the FAB initiatives. Sovereignty always lies with the State. Sovereignty issues can be addressed through amendments to legislation and require a full involvement and cooperation with the military. Liability issues can be resolved through contractual arrangements between ANSPs following approval of the States.

h) **Constitutional/legal impediments in some Member States**: In some Member States, there are or have been constitutional impediments to delegation of ATS provision, either on the basis that assets used to provide the service must reside within the Member State or an express prohibition of the provision of ANS by

organisations outside the Member State. The extent of these constraints has not been investigated comprehensively for all States in this study. However, the PRC understands that this issue either remains (Germany) or has been addressed in revised Aviation Acts (Bulgaria, Romania, and Austria).

i) **Difficulties in agreeing financial arrangements**: When FABs have considered making changes to charging arrangements, they have found it very difficult because any proposed changes will lead to some re-distributional issues among airlines. Even if the changes make sense from a "business" and operational point of view (e.g. limit the use of longer, but cheaper, routes within a FAB), some airspace users will oppose the change. This has the potential to slow down, or prevent, the change being implemented. Moreover, where ANSPs within the FAB have different corporate objectives (profit maximising, or cost recovery) this may lead to different views of the potential to redistribute costs and revenues across ANSPs in the FAB.

j) **Lack of sharing of best practice across FAB initiatives**: A number of FABs believe that more formal sharing of best practice should take place. The current Periodic Information Meetings (PIM) process is not seen as sufficient to fulfil this purpose in the long run. Moreover, best practices should also be shared across NSAs, which is outside the scope of this forum.

B) Expected impact on performance

Factual assessment 12: Various approaches and maturity of Cost Benefit Analyses

By October 2008, only six CBAs or high level economic appraisal had been received, albeit with various levels of maturity and completion. Available CBAs were organised differently and built on different assumptions, which makes a comparison of expected performance benefits challenging.

A range of approaches have been used for these CBAs. In FAB EC and FAB CE, an assessment of staged changes and in Blue Med a "do minimum" and "do maximum" scenarios were used to illustrate the range of possibilities.

7.2.18 Chapter 6 reviews the CBAs produced by the Danube FAB, FAB EC, FAB CE, NUAC, UK-Ireland, and a high level "economic appraisal" produced by Blue Med.

7.2.19 There is a wide range of maturity in CBAs produced to date, and all of them are subject to revision. Some are based on extensive work, including simulations and modelling, while others are mainly based on unsubstantiated assumptions or "expert" judgements. The latter constitute a weak basis for implementation decisions.

7.2.20 It is therefore important for FAB initiatives (or sub-initiatives) to be specific about deliverables, timescales, benefits and costs before implementation decisions are taken. In this context, the FAB initiatives could make best use of the EC framework for "Impact Assessment" and its associated guidelines (SEC (2005)791).

7.2.21 In addition, these analyses should be published, so that stakeholders can monitor progress. This process would make the FABs more accountable to their customers and regulators. Such an approach is planned through the review by NSAs of all the business cases for the UK-Ireland FAB Management Board.

Factual assessment 13: Expected benefits from available CBAs

The SES legislator and airspace users expected FABs to provide significant improvements in performance and "quick wins".

Due to a wide range of approaches and quality in Cost-Benefit Analyses, it is not easy to assess and compare the magnitude, timing and robustness of expected improvements from FAB initiatives. This is especially the case for safety and operational improvements.

Nevertheless, for illustration purposes, the PRC has attempted to evaluate the net projected benefits in 2013 and in 2018 for each FAB, and to relate these benefits to the 2006 total economic costs (ANS provision costs + costs of route extension and ATFM delays incurred by airspace users). A summary of this comparison is presented in Figure 7-4.

The largest relative benefits are identified for FAB EC, NUAC and the Danube FAB. Assumptions and expert judgements would need to be confirmed for the Danube FAB. Due to its central location and weight, FAB EC has a key role in improving the performance of the European ANS system. NUAC shows that strong cooperation can lead to significant further performance improvements in already well performing low/medium density areas.

Benefits arising from other FAB initiatives tend to be lower, slower or more uncertain. For FAB UK-Ireland, the timing and magnitude of the changes to be implemented by the FAB Management Board are not yet decided, and the benefits are for the time being uncertain. In general, the higher the commitment from States and ANSPs, the higher the benefits.

Feasibility studies often recommend a phased approach to implementation rather than a "big bang" approach. While this may delay benefits, this is a pragmatic approach taking into account the practicalities of change management in the ANS industry.

7.2.22 The objective of SES regulations is to improve ANS performance. FABs are one of the tools available for ANSPs and Member States to reach SES performance objectives. They should bring the regional component of performance improvement.

7.2.23 This assessment indicates that FABs are creating a positive momentum for co-operation between ANSPs and between Member States, which presents opportunities and prospects for performance improvements beyond those achievable individually.

7.2.24 Airspace users remain concerned that the promised benefits of SES have not yet materialised. Moreover the promised benefits of the FAB feasibility studies tend to be after 2012 and in many cases predict only modest improvements in productivity and cost-effectiveness. Airspace users do not perceive a sense of urgency from States and ANSPs to address their top priority of reduction in unit costs.

7.2.25 To give an indication of the relative benefits of the FAB initiative CBAs and to compare them, the PRC has made an attempt to derive the annual net benefits (direct and indirect benefits from savings in delay and flight-efficiency to users) and weight those benefits against the 2006 total economic costs for the FAB (see Figure 7-4 below).

Figure 7-4: Annual net benefits as a % of Total Economic Costs (2006)

FAB	2006 total economic cost in M€	2013 benefits in M€	2013 benefits as % of 2006 total economic costs	2018 benefits in M€	2018 benefits as % of 2006 total economic costs
Blue Med					
Scenario min	€ 1.070 M	€ 14 M	**1%**	€ 17 M	**2%**
Scenario max		€ 49 M	**5%**	€ 71 M	**7%**
Danube *					
Scenario 1,8%	€ 239 M	€ 52 M	**22%**	€ 52 M	**22%**
Scenario 1%		€ 29 M	**12%**	€ 29 M	**12%**
FAB CE					
Static	€ 542 M	€ 6 M	**1%**	€ 30 M	**6%**
Dynamic (big bang)		€ 6 M	**1%**	€ 21 M	**4%**
Dynamic (gradual)		€ 6 M	**1%**	€ 27 M	**5%**
FAB EC	€ 3.147 M	€ 260 M	**8%**	€ 1.150 M	**37%**
NUAC	€ 255 M	€ 47 M	**18%**	€ 51 M	**18%**
UK-Ireland FAB	€ 1.135 M	€ 12 M	**1%**	€ 40 M	**4%**

*: Assumptions and expert judgements would need to be confirmed

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Factual assessment 14: Opportunity to improve flight-efficiency and environment

Horizontal route extension (a component of flight-efficiency) is a major performance issue, with significant economic and environmental impact. This is attracting increasing attention in the debate on sustainable air transport development.

The average route extension in Europe was approximately 50 km per flight in 2007. Recognising that flight-efficiency cannot be optimised without considering potential impacts on capacity and safety, there is a limit to potential improvements. However, even limited improvements would have very positive economic and environmental impacts.

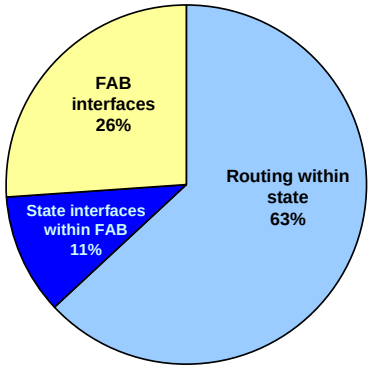
FABs have a role to play in reaching such significant performance improvements. The PRC's analysis indicates that FABs have the potential to reduce route extension by improving interfaces between participating States (which counts for 11% of route extension, see Figure 7-5). Moreover, FAB initiatives often create a momentum to address flight-efficiency issues **within** participating States (including civil-military) which has a greater potential for improvement (63% of route extension are within States, see Figure 7-5).

However, approximately one quarter of route extension issues need to be resolved across FABs and Europe-wide.

7.2.26 The average horizontal route extension for each FAB initiative have been calculated and broken down into three different components, as shown in Figure 7-5:

- Routing within a State;
- Interfaces between States within the FAB; and
- Interfaces between FABs.

Figure 7-5: Breakdown of route extension showing potential impact of FABs



7.2.27 This calculation is presented in more detail in Chapter 5. It shows that the FAB initiatives can primarily address the issues of improved routing within States and between the States within the FAB. These account for 63% and 11% of all route extensions respectively. Although the issue of routing within States could in theory be addressed without a FAB, it appears that FABs are a catalyst to also address "local" issues due to:

- pressure to obtain quick wins (for example, more effective civil/military cooperation); and
- a larger geographical area of airspace being available to find solutions to operational issues, which are more difficult to solve at national level.

7.2.28 The interfaces between FABs account for 26% of route extension, significantly more than interfaces between States within each FAB. Therefore, improved co-ordination of the entry/exit points between FABs is also important. Some FABs are addressing the issue of inter-FAB route design, through co-operation between FABs and surrounding ANSPs. These, however, cannot achieve the necessary pan-European dimension. A Pan-European mechanism is needed to ensure the consistency of airspace design and use across-FABs.

7.2.29 Indicators show that, in some cases, interfaces between States within a FAB are already quite well optimised (NUAC, FAB Spain Portugal, Blue Med and FAB UK-IR). Further operational benefits from the FAB are therefore limited, at least with these proposed groupings of FIRs into FABs.

7.2.30 It must be noted that different groupings based on operational requirements and not necessarily following national boundaries could provide different operational benefits, in particular with regard to interfaces between States.

7.2.31 Recognising that flight-efficiency cannot be optimised without considering potential impacts on capacity and safety, the PRC considers that a maximum of 30% improvement in route extension (approx. 15 km per flight) could be achieved on average across Europe. As the economic cost of route extension has been estimated at €2,400 million in 2007 (see PRR 2007), this implies that the economic value of reduced route extension could be up to €700 million per year (with fuel prices and traffic levels in 2007).

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Factual assessment 15: Identification of performance objectives in some FABs

Three FABs have identified, with their Member States, key performance areas and emerging targets/objectives for performance improvements: FAB EC, FAB CE and Blue Med. Others have identified key priority areas to focus the initial work of the FAB without specific quantified performance targets/objectives (FAB UK-Ireland, NUAC). Details can be found in Chapter 4 of this report.

This, alongside with emerging CBAs, shows the institutional commitment to introducing change through FABs and recognising that FABs must lead to quantified net performance improvements. Moreover, it is consistent with SES II draft requirements for the introduction of regional/local performance plans, consistent with the Community-wide performance objectives.

Conversely, the absence of specific quantified performance targets has contributed to the slow pace of other FAB initiatives.

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Factual assessment 16: Opportunity for target setting at FAB level

The draft SES II legislation includes an option for target setting at FAB level. With some prerequisites (prior convergence in performance, proper accountability and governance, etc), this would give FABs a very concrete meaning and facilitate the implementation of the SES II performance scheme.

7.2.32 The performance scheme in the draft SES II legislation includes performance targets and means to ensure that they are met, and specific reference to "*national or regional [i.e. FAB] Performance plans*".

7.2.33 Where relevant and feasible, setting regional (FAB-level) performance targets and allocating accountability for meeting them at FAB level would have several advantages:

- It would reduce the number of local target setting processes, and therefore reduce the cumulative efforts to be devoted by Europe-wide bodies: the European Commission, EUROCONTROL, stakeholder organisations and the Performance Review Body;
- NSAs or their groupings would have a wider field of action, have more resources and wider experience and thereby be reinforced; consultation would be more thorough; wider coverage would ensure a more balanced approach in the region;
- The coordination of NSAs, e.g. through a formal group, would be simplified;
- It would foster cooperation among ANSPs in the FABs: it would be easier for them to meet performance targets collectively, encourage joint initiatives such as joint procurement and limit opportunities of pushing issues to the neighbours. Collective accountability would also reinforce solidarity of the management and of the staff;
- It would fall short of target-setting by a European regulator and ensure that local problems are addressed locally, with full knowledge of local circumstances, thereby respecting the subsidiarity principle, and finally;
- It would give reality to the concept of FABs, and make them one of the SES building blocks, with a real impact on performance.

7.2.34 FAB-level target setting may not be applicable in certain performance areas (e.g. safety). There may be genuine impediments as well. Prerequisites for setting targets at FAB level would need to be identified, e.g. some degree of convergence in key performance areas (e.g. cost-effectiveness), mechanisms for allocating accountability to reach performance targets among participating ANSPs. A detailed analysis would need to be conducted concerning target setting and accountability to meet them at FAB levels.

7.3 Conclusions and Recommendations

7.3.1 The PRC conclusions and recommendations concerning FAB initiatives are grouped in 10 areas:

A) Benefits to be expected from FABs;

B) Political commitment to the implementation of FABs;

C) Deadlines for FAB implementation;

D) Involvement and co-operation of all stakeholders

E) Ensuring consistency and connectivity of the European network;

F) Guidance for the creation of FABs;

G) A framework to address sovereignty and liability issues;

H) Minimum requirements for CBAs;

I) Exchange of information between FABs and with the EC; and

J) Performance reporting and target setting at FAB level.

A) Benefits to be expected from FABs

7.3.2 The objective of SES regulations is to improve ANS performance. This first PRC evaluation of FABs shows that FABs can be an effective tool, amongst others, to reach SES performance objectives – provided there are a shared vision, ambitious objectives, and strong commitments from the stakeholders to effectively reach these objectives.

7.3.3 In fact, the proposed SES II package reinforces the FAB concept, through its objective "*to optimise and/or integrate the provision of ANS and related ancillary functions*". This is a clear step forward.

7.3.4 During 2008, six (out of nine) FABs have undertaken intensive work and have invested significant effort and resources in developing feasibility studies. One FAB initiative - FAB UK-Ireland was officially implemented in June 2008 and came into effect in July 2008. It is clear that the legal obligation to create FABs has generated a positive momentum for co-operation between ANSPs and between Member States, and opportunities for performance improvements beyond those achievable individually. This should be preserved and reinforced.

7.3.5 The analysis of available CBAs has shown that, apart from FAB EC and NUAC, benefits arising from other FAB initiatives tended to be lower, slower or more uncertain.

- **Recommendation 1:** FAB sponsors should demonstrate significant identifiable benefits from their FAB initiatives prior to authorising further steps.

- **Recommendation 2:** In the event that the identified benefits are not significant, States should identify alternative means of achieving performance improvements. Such improvements should form part of the performance review and target-setting scheme, including any European Commission review, under SES II.

B) Political commitment to the implementation of FABs

7.3.6 A lack of commitment and guidance from States was identified as one of the key reasons for the initial slow progress in FAB initiatives.

- **Recommendation 3:** States should reaffirm their commitment to create FABs during the discussion on SES II in the Transport Council of the European Union.

C) Deadlines for FAB implementation

7.3.7 The European Commission proposes to introduce a deadline of 2012 for the establishment of FABs in its proposed legislation for SES II. This deadline seems to be realistic and achievable in view of the timescale of most FAB initiatives.

7.3.8 However, this deadline may need to be complemented to ensure continued progress. The phased nature of implementation planned by most FAB initiatives, including the UK-Ireland FAB that has already started its implementation phase, shows that launching a FAB does not guarantee prompt benefits.

7.3.9 In order to further strengthen the momentum and focus the attention of all involved stakeholders, the PRC suggests that more detailed deadlines are introduced in SES II concerning the creation of FABs.

- **Recommendation 4:** The following deadlines could be added into the SES II legislation:
  - By 2010 for FABs to publish a performance plan, including the profile of planned performance improvements and quick-wins;
  - By 2011 for the European Commission to adopt detailed rules or guidance on FABs as part of SES II;
  - By 2012 at the latest for FABs to implement identified quick-wins.

D) Involvement and co-operation of all stakeholders

7.3.10 Most significant progress has taken place where there was a proper involvement of all key stakeholders (States, staff, military and airspace users) as well as cooperation between NSAs.

- **Recommendation 5:** All stakeholders, including the military, airspace users and staff representatives should be adequately involved in FAB initiatives. In particular it is necessary:
  - to develop or strengthen effective social dialogue between all staff representative organisations and ANSP management;
  - to organise effective cooperation amongst NSAs of the FAB; and
  - to address military issues and civil-military coordination.

E) Ensuring consistency and connectivity of the European network

7.3.11 Since all FABs follow boundaries of existing FIRs (and current ATS delegations), and that most FAB initiatives have concentrated primarily on improvements to the design of airspace within the FAB, there is a need to ensure the connectivity of the European network across FABs.

7.3.12 Improvement in flight-efficiency within each FAB provides significant opportunities for savings to airlines, passengers and benefits for the environment. However, since approximately one quarter of European route extension issues can only be solved across FABs and Europe-wide, a strong and effective network management and design function at European level, as proposed in SES II, is crucial.

- **Recommendation 6:** The network management and design function identified in the SES II package should be entrusted with facilitating intra-FAB and Europe-wide consistency of airspace design and use, making use of EUROCONTROL technical expertise as appropriate.

F) Guidance for the creation of FABs

7.3.13 Clearly each FAB is different and faces different political, operational, technical and economic challenges. The evaluation has identified that FAB initiatives show wide differences in scope, timescales and approaches. It is therefore clear that a flexible approach needs to be maintained, as long as performance improvements are delivered.

7.3.14 Several FAB initiatives implicitly or explicitly consider one or more of the following ANS cooperation scenarios: co-operation agreement, operational alliance (some joint functions) and merger. A progressive evolution is sometimes foreseen.

7.3.15 A comparison of feasibility studies shows that a lot of effort is devoted in each FAB to the same issues and with similar results. Moreover, most FAB initiatives have reported similar impediments for the creation of FABs. Greater guidance and coordination for the establishment of FABs would help avoid misunderstandings and duplication of work.

- **Recommendation 7:** The European Commission should establish guidance on the establishment and deployment of FAB initiatives. This could be in the form of implementing rules as proposed in Article 9a(7) of the service provision Regulation of the SES II package.

  At operational and technical levels, the following areas are essential:

  - A common operational concept;
  - A coherent approach to safety;
  - Air Traffic Flow and Capacity management (ATFCM) and Airspace Management (ASM) at European and FAB level; and
  - Interoperable ATM systems, including the FDP system.

  In addition, the guidance could include a common approach to charging, which is a desirable component of a FAB.

  Such guidance will need to allow for transitional arrangements and flexibility on the timing of introduction of changes by FABs, depending on local circumstances.

F.1) A common operational concept

7.3.16 The operational concept comprises several components, including:

- Airspace organisation and management;
- ATM service delivery;
- Conflict management;
- Demand and capacity balancing; and
- Traffic synchronisation.

7.3.17 A common operational concept, consistent with the ICAO Global ATM Operational Concept (Doc 9854) is a major opportunity to improve efficiency, capacity and quality of service through, for example:

- removing disjointed operational interfaces (improving seamlessness) between the ANSPs within the FAB and providing a uniform service across the FAB;
- better management of traffic and airspace complexity;
- allowing dynamic sectorization across ANSPs as driven by demand; and
- enabling common ATCO resource planning by moving towards a system where ATCOs can be trained, qualified and operate across ANSPs (although this might also require a common human-machine interface).

7.3.18 Therefore, the PRC recommends that:

- **Recommendation 8:** There should be a common operational concept for similar airspace within each FAB. This would allow for more than one operational concept within a FAB, where a FAB contains airspace with significantly different characteristics (for example, Oceanic airspace).

F.2) A coherent approach to safety

7.3.19 Different approaches to safety, both in terms of regulation and safety management, are likely to limit the scope of the FAB, for example in terms of the ability to dynamically allocate staff between ANSPs for cross-border ATS delegation, and the requirements for generic sectors, common training and certification, etc.. In addition, as there are some common network functions, such as airspace design, AMC and flow management, there must be a coherent approach to safety for those functions.

7.3.20 The application of a common operational concept and common ATM systems must also comply with safety regulations and the safety management systems (SMS) of the participating ANSPs. In order to avoid the complexity of meeting a set of slightly different safety requirements and the associated duplication of effort, a single approach to safety across the FAB would be the most effective solution, although it is not necessary. Mutual recognition and delegation could also be applied as an alternative, as at the Maastricht Upper Area Control (MUAC) Centre. However, this would be more unwieldy than a single safety management system. The single safety management system would have the advantage of fewer interfaces and lower complexity.

7.3.21 Training and certification of ATCOs and engineers is also closely linked to safety. Similarly to safety, training and certification could be organised through a variety of schemes subject to mutual recognition and/or delegation. Alternatively a single, approved scheme could bring economies of scale and lead to more uniformity.

7.3.22 Moreover, no FABs have yet established a safety case notwithstanding the fact that it is one of the few mandatory requirements listed in Article 5(2) of the airspace Regulation. Since a "Safety Case" is a live document used to provide evidence that a known state of a system and associated operations meets their safety requirements, Safety Case cannot be established prior to the operation of the FAB. Therefore, safety assessments, rather than safety cases, should be required for the creation of FABs in SES legislation.

- **Recommendation 9:** A coherent approach to safety is an essential characteristic of a FAB. In particular, common reporting standards should be developed at FAB level to contribute to an increase in reporting and safety awareness reflecting principles of a "Just Culture".
- **Recommendation 10:** For some of the emerging safety issues, European level solutions need to be developed to avoid duplication of effort and multiple solutions. For example, a common safety approach for UAV operations and for dynamic sectorization.
- **Recommendation 11:** the SES requirement for a FAB to provide a "Safety Case" should be replaced by a requirement to produce a "Safety Assessment".

F.3) Organisation of Air Traffic flow and Capacity management (ATFCM) and Airspace Management (ASM)

7.3.23 Some FABs propose to create airspace design functions, airspace management cells (AMCs), and flow and capacity management functions/units at FAB level.

7.3.24 In order to improve efficiency, and not to create a third layer of organisation, these functions/units would have to **replace** rather than duplicate activities that are currently undertaken at ANSP level. A European flow management unit would still be required for Air Traffic Flow and Capacity Management (ATFCM) at European level.

7.3.25 The approach to network management in each FAB must be consistent with the overall European Network Management and Design function proposed by SES II.

- **Recommendation 12:** Air Traffic Flow and Capacity Management (ATFCM) and Airspace Management (ASM) should be organised at FAB level provided that these functions replace functions currently undertaken at ANSP level, and that they be subject to common requirements. An effective European Flow Management Unit remains necessary to provide ATFCM across FABs, a single contact point for airspace users, and a focal point for Cooperative Decision Making (CDM) involving airspace users, airports, and FAB or national ATFCM/ASM units.

F.4) Interoperability of systems

7.3.26 FABs, and ANSPs within FABs, are taking different approaches to ANS systems. However, while considering that ANSPs will have to comply to the future SESAR requirements, interoperability and overall efficiency would need to be ensured through:

- Common system development, sourcing and procurement;
- Common maintenance processes and personnel;
- Greater commonality in technology, systems and their associated support processes;
- Common or interoperable Flight Data Processing and Human Machine Interface, facilitating the application of a common operational concept and enabling mobility of ATCOs;
- Global and/or Europe-wide interoperability standards.

7.3.27 The PRC recommends that:

- **Recommendation 13:** The ATM systems used by ANSPs in a FAB should be equivalent in terms of functionality and performance output. They should be fully interoperable within the FAB. Global/Europe-wide interoperability standards should apply across the FABs. FABs should progressively reach common specifications, procurement and maintenance and have regard to emerging SESAR requirements.

F.5) A common approach to charging

7.3.28 FABs will operate within the Common Charging Scheme Regulation. However, this allows considerable flexibility in the precise mechanisms used, e.g. defining charging zones, allocating costs and applying incentive schemes.

7.3.29 Article 4 of the charging scheme Regulation provides that when States have decided to create a common cross-border charging zone (for instance within a FAB), *"Member States concerned shall make the appropriate arrangements to ensure **consistency** and **uniformity** in the application of this Regulation to the airspace concerned"*. Nevertheless, when creating a FAB, State do not necessarily have to create a common cross-border charging zone.

7.3.30 Although some of the FAB initiatives are planning a common unit rate within the FAB, others consider that this is not necessary to achieve the objectives of the FAB.

7.3.31 Recital 9 of the charging scheme Regulation provides that "at the time when the Commission will draft its report on the creation of FABs, the Commission will assess the difficulties that may arise from maintaining separate unit rates within a functional airspace block".

- **Recommendation 14:** The definition and implementation of an appropriate charging regime within FABs, irrespective of national boundaries, is key for an efficient route design and management of traffic flows. The charging regime in a FAB should allocate revenue to service providers within each FAB on the basis of where services are actually provided, rather than on the basis of national boundaries.

- **Recommendation 15:** In the event that a FAB initiative decided that a common unit rate should be introduced for the FAB:
  - the impact of redistribution of charges between airspace users should be taken into account and national unit rates should preferably have converged;
  - a mechanism should be introduced between the States/ANSPs participating in the common unit rate to allocate the revenues to each State/ANSP on the basis of a key to be regularly defined by States/ANSPs;
  - a mechanism should be introduced to ensure a minimum discipline between the ANSPs participating in the common unit rate in order to ensure a uniform approach in cost control in the area.
- **Recommendation 16:** In order to carry out the requirements of Recital 9 of the common charging regulation, a detailed review should be undertaken in the near future to see whether the flexibility of the charging scheme Regulation has facilitated the reorganisation of the airspace and the provision of air navigation services within each FAB.

G) A framework to address sovereignty and liability issues

7.3.32 Different FAB initiatives expressed different views as to whether sovereignty or liability issues were a difficulty in the context of cross-border ATC delegation. Although some considered that the Überlingen case provided a sufficient clear precedent for determining liability of States and ANSPs, others thought that these issues should be clarified by the European Commission based on international law. In addition, some FABs suggested that European legislation could be used to address constraints arising in national laws on cross-border provision of ANS. However, while deserving careful attention, both sovereignty and liability issues should not be considered as show-stoppers for the establishment of FABs.

7.3.33 A review of some aviation acts and/or constitutions has shown that possible difficulties may exist in implementing the SES, in particular the creation of FABs and the cross-border provision of air navigation services. This particular issue deserves great attention. In some cases, aviation Acts have been modified accordingly (Austria, Bulgaria, Romania) while in other cases, some constraints are built in a constitutional act (Germany).

7.3.34 NSAs have a particular status in the SES II emerging legislation. It is important that in the cross-European context, the roles to be performed by NSAs are clearly understood and their ability to act nationally but in a European context has a uniform effect on the efficiency of the ATM system.

- **Recommendation 17:** The European Commission should:
  - undertake a study on legal impediments to the implementation of SES in national legislations of Member States, in particular with regard to the creation of FABs and cross-border provision of air navigation services.
  - provide guidance on the appropriate legal framework for liability that States and ANSPs have when services are provided on a cross-border basis, using available documents already developed by EUROCONTROL such as the “Model State Level FAB Agreement” as well as the “Guidelines on generic military requirements to be considered when establishing a FAB”. This should clarify that the State is always ultimately liable for accidents that occur within its airspace; and

- having regard for the role and effectiveness of NSAs, make appropriate legislative proposals requiring all States to remove any restrictions on the designation of service providers based in other States, or multi-national service providers, avoiding protectionism, provided appropriate safety and other regulatory requirements are met.

H) Minimum requirements for CBAs

7.3.35 The EC has adopted a common framework for "Impact Assessment" and issued Guidelines (SEC (2005)791). The Impact Assessment framework has been well tested in particular in cross-domain areas. It structures the evaluation, and provides an aid to decision-making, including on qualitative and quantitative impacts but also cost and benefits. FABs should make best use of this framework.

7.3.36 A number of weaknesses in CBAs are identified in Chapter 6. The approach to the production of CBAs has been very different across FABs.

- **Recommendation 18:** Any future CBA should be developed in consistency with the EC common approach and guidelines on Impact assessments (SEC (2005)791). In particular, these CBAs should:
  - Have a clear and justified reference case, to provide a realistic assessment of what is likely to occur if the FAB does not proceed. In order to avoid overstating the benefits of the FAB, it is important that this is based on realistic assumptions and takes into account other improvements that may be made: for example through SESAR, and other business initiatives;
  - Identify precise initiatives to be implemented as a result of the FAB, and provide a business case for each of these initiatives. The business case should include detailed deliverables and timescales, and provide estimates of the benefits and the investment, transition, social and operating costs. The business case should also include key dates for implementation of initiatives and realisation of benefits, and set out metrics that can be monitored;
  - Rely on validated facts and plans rather than assumptions;
  - Use substantiated assumptions for discount rates, values of passengers' time, etc.
  - Cover the full range of stakeholders that will be affected by the FAB, including ANSPs, staff, civil and military airspace users, States and passengers.

I) Exchange of information between FABs and with the EC

7.3.37 There has been only limited communication and sharing of best practices across-FABs for both NSAs and ANSPs. The PRC considers that proper links need to be established, as they could save significant time and resources.

7.3.38 At present, there is informal co-operation between FAB project managers through EUROCONTROL Periodic Information Meetings, which is designed to facilitate exchange of information and best practice. There is no formal mechanism for regular communication among NSAs and with the European Commission, except through the Single Sky Committee or for TEN-T funding.

- **Recommendation 19:** In order to improve communication and share best practices across FABs for both NSAs and ANSPs, the European Commission should establish:
  - A formal process to exchange information and best practices between FABs, both for ANSPs and NSAs;
  - An improved channel for communication between FABs and the European Commission for FAB-related matters.

J) Performance reporting and target setting at FAB level

7.3.39 Although only orders of magnitude should be considered, double digit benefits are anticipated from FAB EC, NUAC and Danube. This confirms that FABs are one of the SES tools to improve ANS performance. It will be important to ensure that such levels of improvement are effectively achieved.

7.3.40 Moreover, the evaluation shows that most savings are expected from improvements in flight-efficiency and delays, rather than savings in ANSPs' service provision costs. The latter forming the bulk of ANS total costs. This indicates scope for further improvement.

7.3.41 A number of FABs have identified key performance areas and are discussing performance targets. This anticipates the proposals contained in the SES II package. Where applicable and with some prerequisites, setting targets at FAB level instead of at national level would have several advantages:

- It would reduce the number of local target setting processes and the work of the European Commission , NSAs, users and the Performance Review Body;
- It would reinforce the cohesion of ANSPs, reduce fragmentation while keeping the bottom-up approach, and give a very concrete meaning to FABs.

7.3.42 The new SES II performance scheme should respect the subsidiarity principle, and allocate the responsibility for setting and accountability for meeting performance targets at the level where it best fits, recognising the roles of States, NSAs and ANSPs.

7.3.43 With FABs, there are potentially three levels of responsibility for ANS performance: national, regional (FABs) and European. This presents an opportunity to better address regional level issues, but a risk to dilute and blur responsibilities. Depending on KPAs and local circumstances, responsibility for local targets in a SES II context should be either at national or FAB level, but not both.

7.3.44 As discussed in § 7.2.32 et seq., the draft SES II legislation includes an option for target setting at FAB level. There are prerequisites for setting performance targets at FAB level in a SES II context, in particular clear accountability and oversight for meeting the targets, a degree of prior convergence in performance, a common approach to performance management and common performance reporting in the respective FABs.

- **Recommendation 20: A** common approach to performance management should be introduced within each FAB. To this end, a common approach to performance reporting is necessary in order for all members of the FAB to contribute and to manage performance in a similar way, and to report progress at European level in a common form.

- **Recommendation 21:** Where relevant and feasible, specific quantified performance targets should be set for FABs, as foreseen in the SES II proposal related to performance scheme (i.e., introduction of binding performance targets as part of national or **regional** performance plans[42]) .Local performance targets, established under SES II, should be set at either national or FAB level, depending on local circumstances and KPAs, but not at both levels. These would need to be accompanied by an appropriate mechanism to ensure clear accountability for overseeing and meeting those targets at the proper level (State, NSA and ANSP) and incentivise compliance with the targets.

7.3.45 As FABs are an important SES tool to foster performance improvements, it will be important to monitor progress and maintain pressure on FABs to deliver genuine performance improvements and meet the planned deadlines and deliverables. The PRC recommends that a similar review of FABs is undertaken periodically, using the same framework to assess progress made with reference to the situation at 1 July 2008 presented in this report, and to the respective FAB plans.

- **Recommendation 22:** The progress of FABs should be periodically reviewed, both at local level by NSAs and at European level by the European Commission using the assessment framework defined in Annex II to this report. Progress would need to be compared with targets and timelines outlined in the FABs feasibility studies and implementation plans. This would be part of the SES II performance scheme if performance targets are set and monitored at FAB level.

42 COM(2008) 389/2

ANNEX I: FACT SHEETS

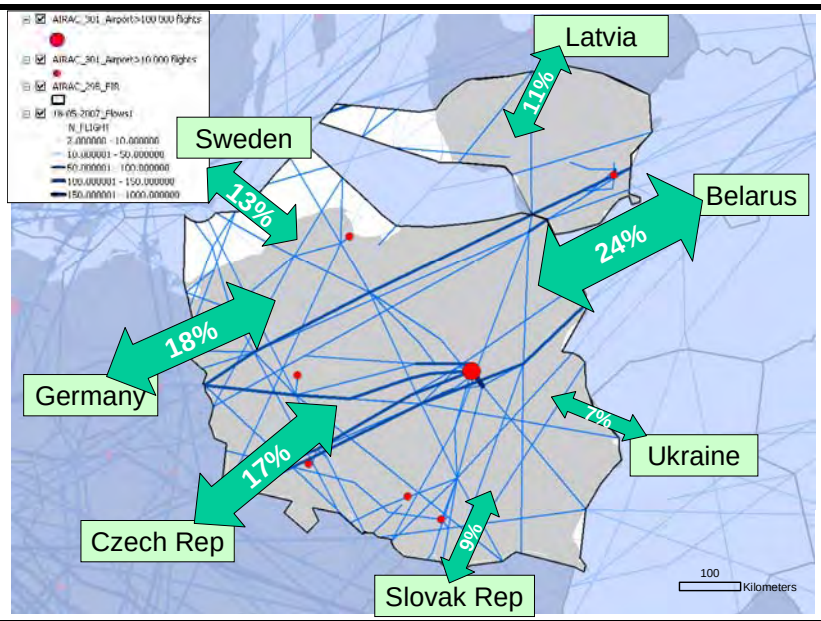
The Fact Sheets for the nine FAB initiatives are contained in the following pages. They refer to the situation as understood by the PRC on 1 July 2008 and reflect comments received during the written consultation on the draft Final Report, which was from 12 September 2008 to 15 October 2008.

Baltic

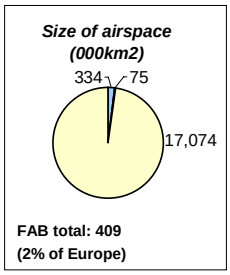
Oro Navigacija (Lithuania), PPL PATA (Poland)

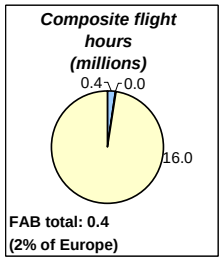
In its current form it is the smallest FAB by most measures, with 69km of common border between the two States. The Baltic FAB was initially proposed to be larger, as Estonia and Latvia were included in early discussions and Latvia signed the Memorandum of Understanding. There is a high level of co-operation already established between the ANSPs.

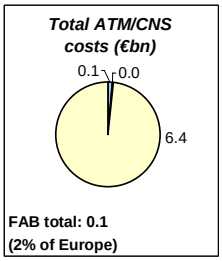
The geography of the FAB poses political challenges, as for the FAB to be fully optimised Kaliningrad would need to be included. This would be possible operationally – Lithuania has previously provided ANS for Kaliningrad – but difficult politically. The inclusion of Belarus could also improve optimisation.

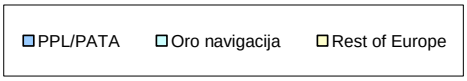


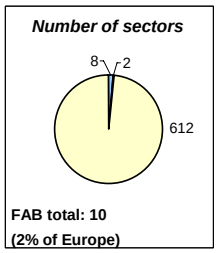
Size of FAB

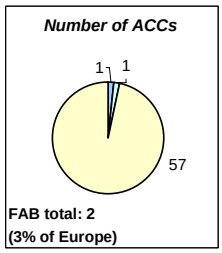


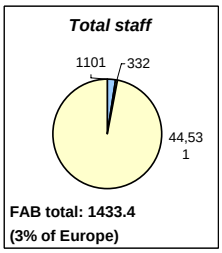


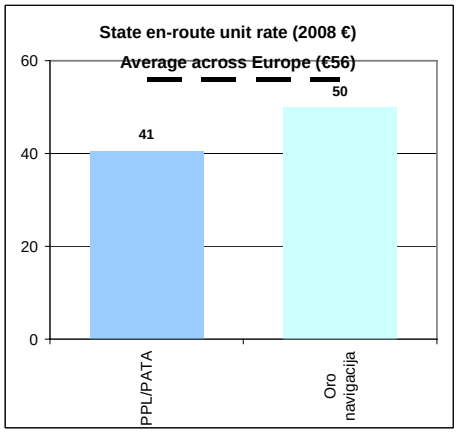






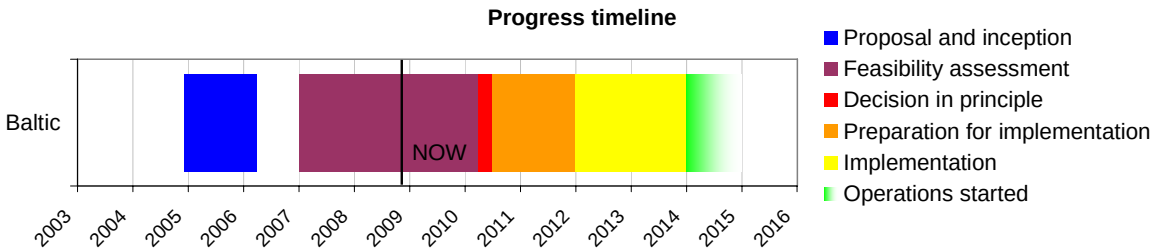






Data taken from ACE Report for 2006

Timescales

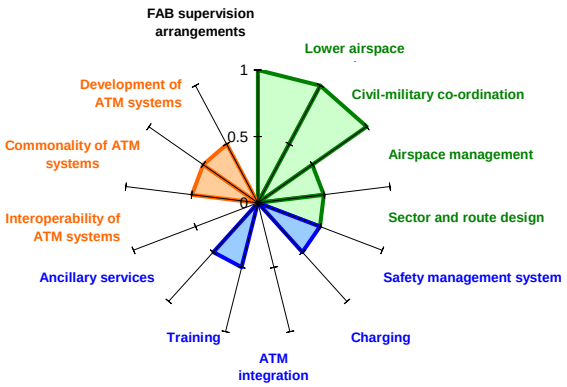


Earlier FAB initiative (Poland, Lithuania, Latvia): begun 6 Dec 2004;
Proposal and Inception: 1 April 2006;
Feasibility assessment: early 2007 onwards. Completion by Nov 2008 (initial assessment), and Q1 2010 (full feasibility study);
Decision in principle by the ANSPs: unknown but stated to be Q2 2010 in feasibility study;
Preparation for implementation: 2011;
Implementation: 2012-13;
Operations started: 2014, with some synchronization with the timeline for SESAR in 2018.

Progress so far: Some initial work started under ICAO in 1999, with the Russian Federation initially included as an observer. In 2003 the States signed a Memorandum of Understanding, which also included Latvia as a party. A Memorandum of Cooperation regarding equipment harmonization followed in 2004, signed by Poland and Lithuania. Latvia is no longer actively involved with the FAB. A number of working groups have been established (navigation, communications, surveillance), and 9 States attend regular informal meetings to share best practice: Latvia, Norway, Sweden, Finland, Belarus, Estonia, Lithuania and Russia (including Kaliningrad ACC).

Proposals for the FAB

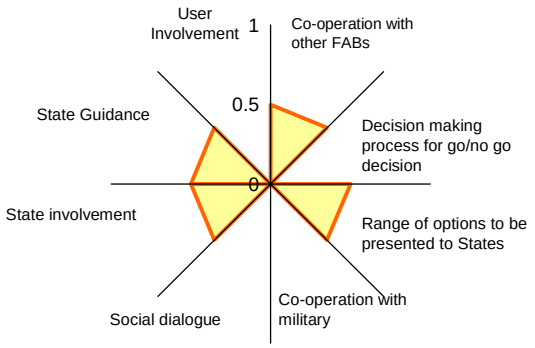
Characteristics



Characteristic	Justification
Lower airspace covered	Lower airspace will be covered
Civil-Military coordination	Have discussed airspace management cell to be based in Warsaw to cover all Military interaction
Airspace management	There is a plan to establish a sub-regional AMC
Sector and route design	There is already close co-operation in this area
Safety Management System	Harmonised safety requirements and methodology are in place and subject to refinement
Charging	No common charging arrangements planned
ATM integration	No intention to merge ACCs
Training	Training schemes will be co-ordinated
Ancillary services	No changes as result of FAB (some from SESAR)
Interoperability of ATM systems	No changes as result of FAB (some from SESAR)
Commonality of ATM systems	No changes as result of FAB until the end of the lifecycle of the system in 2018
Development of ATM systems	Only considered for new equipment, otherwise is likely to continue with two distinct suppliers (investment lifecycle will determine timing)
FAB Supervision Arrangements	A number of options are under consideration, but the role of EASA needs to be clarified first

Proposed changes: The FAB has not yet provided results of a Feasibility Study, so only limited information is available of the possible changes. However, we understand the following areas are being investigated: examining close co-operation for lower and upper airspace; implementing Eurocontrol's interoperability plans; equipment commonality will only be considered for new equipment; and some level of support functions co-operation. At this stage ACCs would not merge. Initially there would not be any common charging arrangements or changes to the current training and staffing policies. Ancillary services would not benefit from a common approach either. FAB Baltic believes that their planning needs to be synchronised with SESAR implementation (2018).

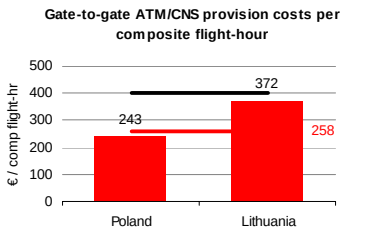
Arrangements



Arrangement	Justification
Co-operation with other FABs	Regular discussions with other States (Latvia, Estonia), Russian Federation, Belarus, NUAC. FAB has raised concerns about interaction with FAB EC (Germany-Poland)
Decision making process for go/no go decision	Yet to be decided, after the feasibility study phase
Range of options to be presented to States	A range of options is under consideration in terms of scope of the airspace, but Kalingrad remains a constant issue
Co-operation with military	This is not a issue being addressed through the FAB, as there are already well established civil-military arrangements between the two States
Social dialogue	There will not be any social dialogue before the FAB is more mature. However the trade unions are aware of the ongoing work. BANC decided to start the process in October 2008
Involvement of States	Through the CAAs, the States are heavily involved. The Minister supported the TEN-T application for the feasibility study
Guidance from States to start and support FAB discussions	The guidance from the States comes from the signed MoU and the MoC. Both States have started the process for establishing targets for the FAB
Involvement of users	Little involvement of users to date. In October 2008, BANC decided to start the process of formal consultation with users

Key Performance Indicators

Economic



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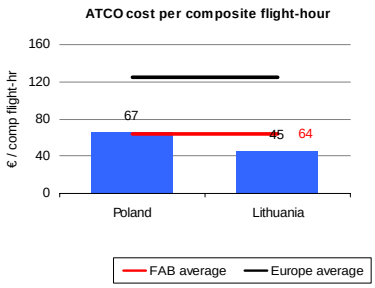

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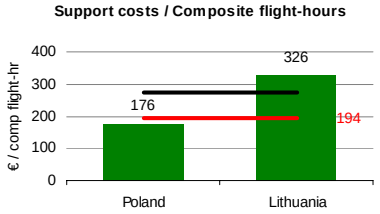
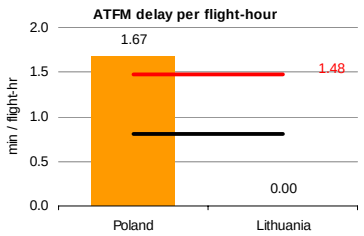
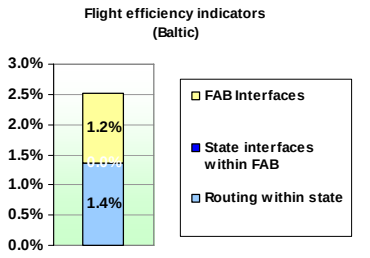


(2006 ACE Data)

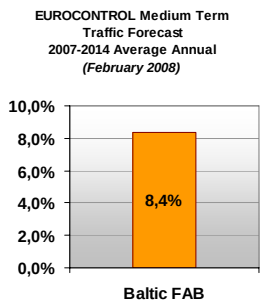
Operational



(2007 data)



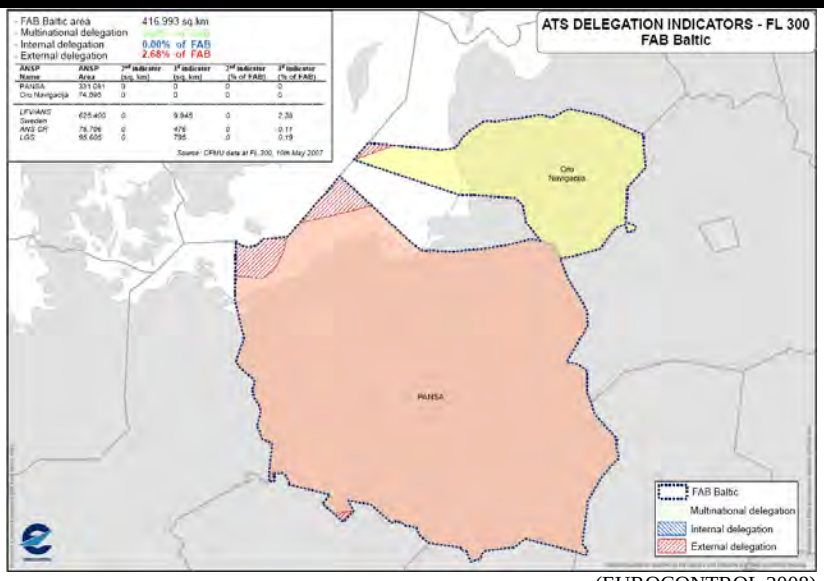
(PRU 2007)



(STATFOR Feb 2008)

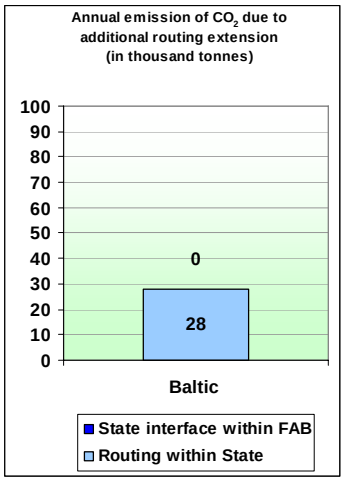
Key Performance Indicators

Operational



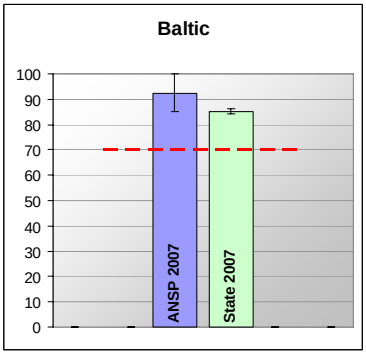
(EUROCONTROL 2008)

Environmental



(PRU 2007)

Safety



(EUROCONTROL 2008)

	ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
Due fully by:	**05-11-2007**	**01-01-2002**		**31-03-2008**	**13-07-2003**		**05-04-2004**		**11-04-2005**	
State	**Reg**	**ANSP**	**Reg**	**AST sent**	**ANSP**	**Reg**	**ANSP**	**Reg**	**ANSP**	**Reg**
Lithuania	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Poland	✓	✓	✓	✓	✓	✓	✓	✓	Planned	✓

(LCIP 2008-2012)

Main quantified benefits from CBA

Main quantified benefits from CBA

No CBA yet

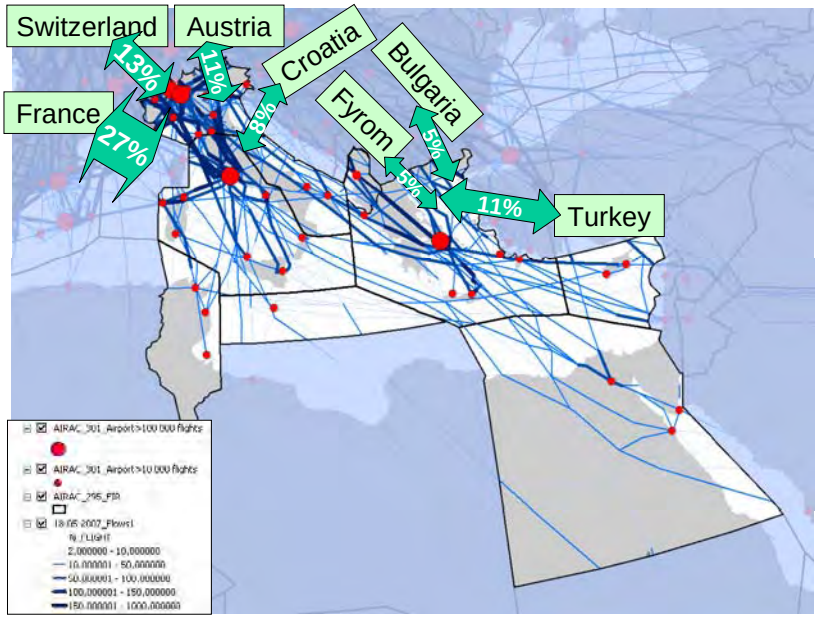
Blue Med

ENAV (Italy), HCAA (Greece), DCA (Cyprus), ATS (Malta)
Tunisia, Egypt, Albania as associate partners, Kingdom of Jordan as observer

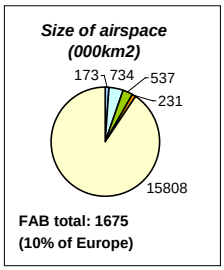
Blue Med covers the southeast Mediterranean airspace. Tunisia, Egypt and Albania are involved as associate partners and the Kingdom of Jordan has been accepted by the Steering Group as an observer.

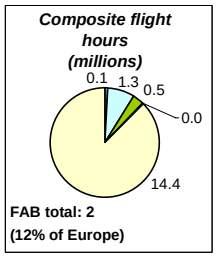
The traffic flows in Blue Med have considerable interaction with other FABs – FAB EC and Danube– and with non-European States. There is therefore a need for close co-operation with other initiatives. The area under consideration includes Tunisian and Egyptian airspace, which will present unique challenges.

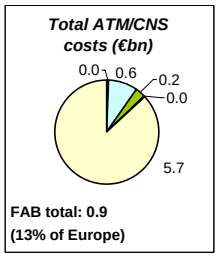
ENAV has a leading role within the initiative, although HCAA, Cyprus DCA and Malta ATS are all leading specific work packages and work streams.

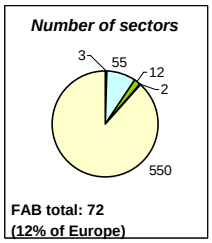


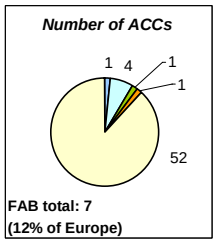
Size of FAB

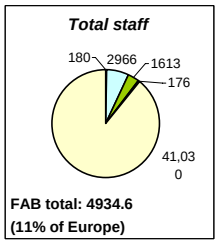


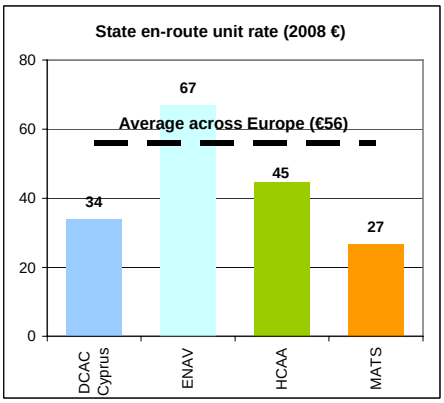






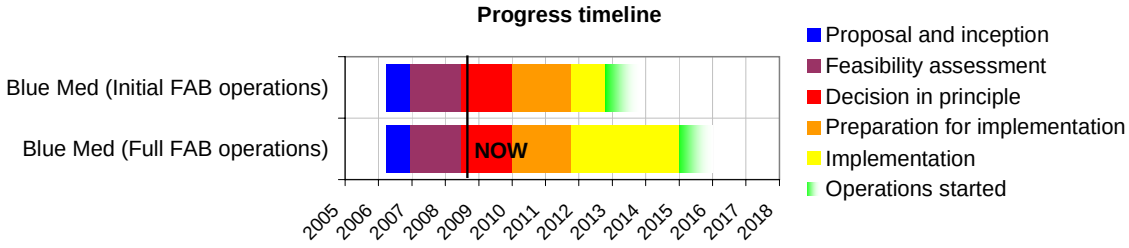






Data taken from ACE Report for 2006

Timescales

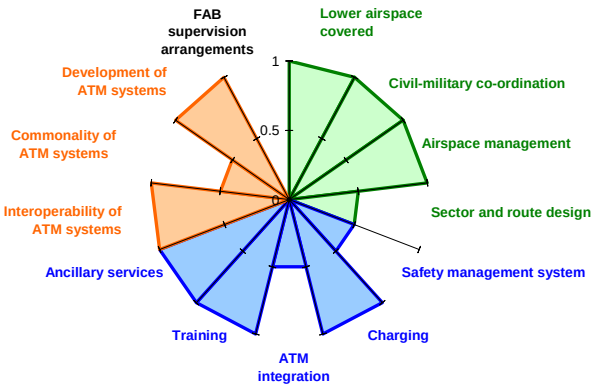


Proposal and Inception: April 2006 (TEN-T funding application);
Feasibility assessment: July 2008;
Decision in principle: 2008 to 2010;
Preparation for implementation: 2010 to late 2011;
Implementation: late 2011 to late 2012 (Initial), late 2011 to late 2015 (Full);
Operations started: late 2012 (Initial), 2015 (Full).

Progress so far: The Feasibility Study was started in December 2006, followed by a completed Project Management Plan in May 2007. The Blue Med High Level Economic Appraisal was completed in July 2008. The final Feasibility Report was released in July 2008, supported by a Declaration of Intent from all CAAs on the Definition Phase. A ministerial conference took place on 4th November: it endorsed feasibility results, and started the Definition Phase.

Proposals for the FAB

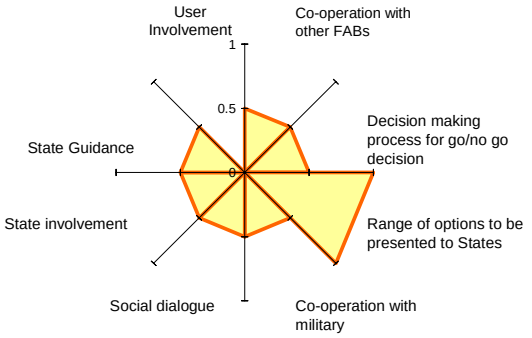
Characteristics



Characteristic	Justification
Lower airspace covered	Lower airspace is covered to the same extent as upper airspace
Civil-Military coordination	In the maximum scenario the FAB is considering a single civil-military co-ordination cell
Airspace management	Considering a common airspace design team, and introducing a regional ATFCM cell (in max scenario)
Sector and route design	Some optimisation of airspace design planned – emphasis is on upper airspace. Creation of Virtual Centre expected to lead to more direct routings. Clarification required on what exactly is included in the Virtual Centre concept.
Safety Management System	A common and harmonised safety system, with local (national) SMS but co-ordinated at FAB level
Charging	As part of the Feasibility Study the initiative examined the possibility of introducing a single unit rate.
ATM integration	Virtual centre will allow some integration of service provision, but ANSPs are very unlikely to merge
Training	Some rationalisation of approach to training being considered
Ancillary services	Some rationalisation of approach to ancillary services, with potential for joint procurement
Interoperability of ATM systems	Interoperable technologies planned (e.g. ATM 2000+, COFLIGHT project)
Commonality of ATM systems	Cross-national technological initiatives will ensure some commonality of ATM systems
Development of ATM systems	Considering the potential for joint procurement
FAB Supervision Arrangements	Nature of the supervision arrangements have yet to be determined

Proposed changes: The approach will be based on the concept of a "Virtual Centre", defined as a group of remotely located interconnected ACCs operated by different ANSPs, operating as a single ATM centre. It will allow greater flexibility in handling cross-border flows, on the basis of available capacity rather than national boundaries. Areas where changes are expected to be made include: interoperability, for the minimum requirements needed to support the "Virtual Centre" concept, and minimising cost of defragmentation; options for the definition of Sector Families are being examined; in terms of ATS Network design the aim is to develop an airspace structure that provides straighter routings (building on the work already undertaken by ECAC). The work so far has identified a number of 'FAB Improvement Areas' where significant benefits can be generated. These are divided into operational, technical and other, and include: common route and sector design, airspace consolidation, and harmonised ATM systems.

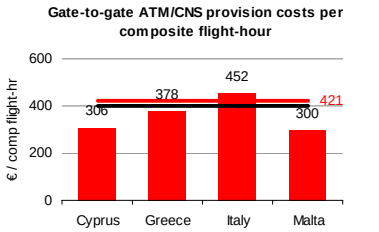
Arrangements



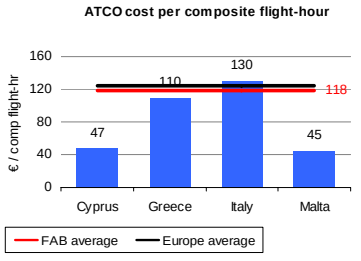
Arrangement	Justification
Co-operation with other FABs	Some discussions with other FABs in Eurocontrol PIM, cross border co-operation with FAB EC and co-ordination with NUAC
Decision making process for go/no go decision	Unanimity single voting per Member State - to be developed further in next stage of work.
Range of options to be presented to States	A minimum and maximum scenario is presented to States in the Feasibility report.
Co-operation with military	FAB has acknowledged that this was initially poor but now underway. Military authorities are going to have an active role in the Governance of the BLUE MED definition phase.
Social dialogue	Some consultation with worker representatives, but limited because project is experimental at this stage. Model for improved dialogue presented at forum in Malta
Involvement of States	The States will lead the Definition Phase of the BLUE MED Project. To date the feasibiltiy study has been led by the ANSPs and consulted with state representatives
Guidance from States to start and support FAB discussions	There is planned to be a ministerial conference in November 2008.
Involvement of users	Users have expressed their dissatisfaction with the level of consultation. Some involvement at stakeholder meeting in Malta in June

Key Performance Indicators

Economic



(2006 ACE Data)



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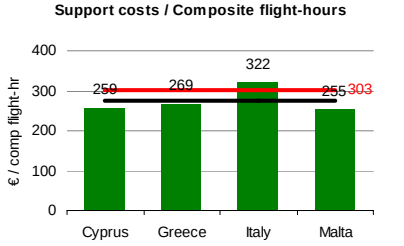
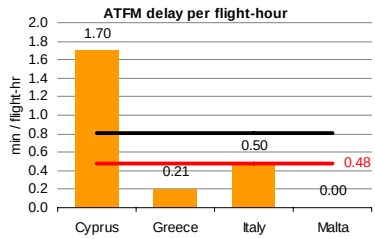


(2006 ACE Data)

Operational



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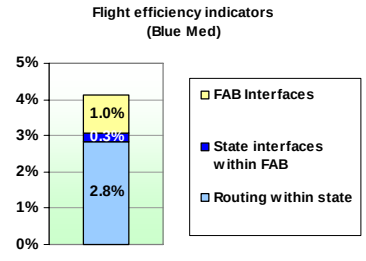
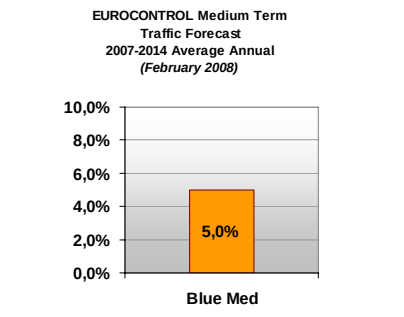


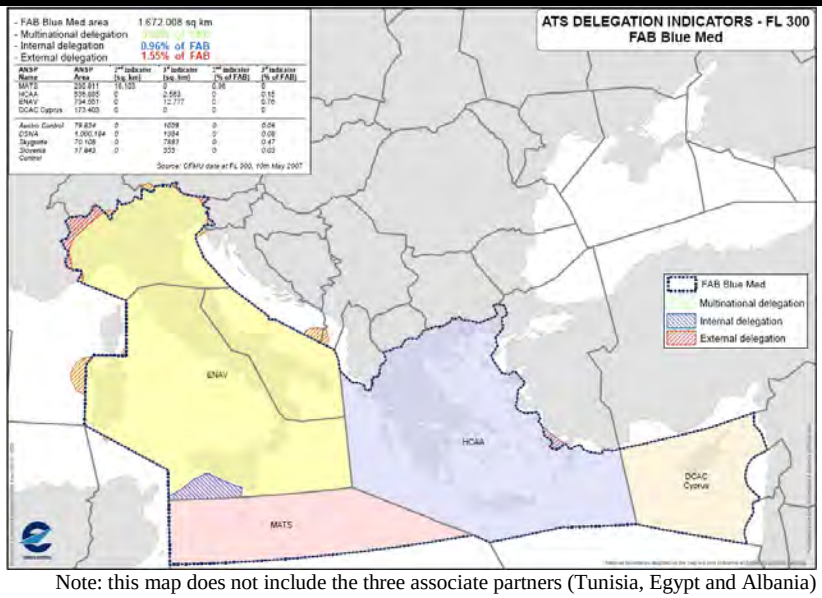
(PRU 2007)



(STATFOR Feb 2008)

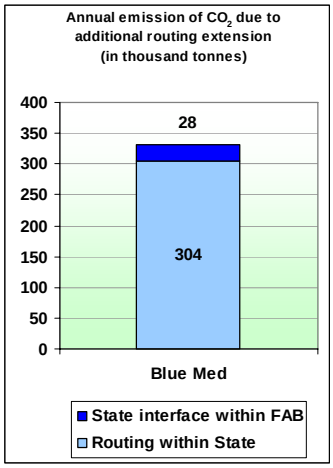
Key Performance Indicators

Operational



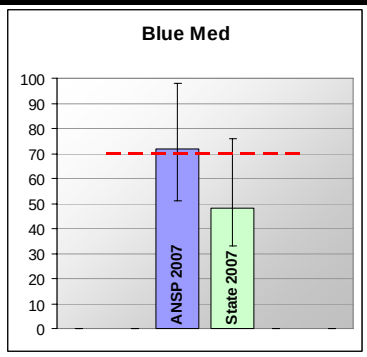
Note: this map does not include the three associate partners (Tunisia, Egypt and Albania)
(EUROCONTROL 2008)

Environmental



(PRU 2007)

Safety



(EUROCONTROL 2008)

	ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
Due fully by:	**05-11-2007**	**01-01-2002**		**31-03-2008**	**13-07-2003**		**05-04-2004**		**11-04-2005**	
State	**Reg**	**ANSP**	**Reg**	**AST sent**	**ANSP**	**Reg**	**ANSP**	**Reg**	**ANSP**	**Reg**
Cyprus	✓	✓	✓	No report	✓	✓	Late	Late	✓	✓
Greece	Late	Partial	Partial	No report	Partial	Partial	Partial	Partial	Late	Late
Italy	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Malta	✓	✓	✓	✓	✓	✓	✓	Partial	✓	✓

(LCIP 2008-2012)

Main quantified benefits from CBA

Main quantified benefits from High Level Economic Appraisal

FAB	2013 benefits in M€	*% of net benefits derived from improved flight efficiency and delay*	2013 benefits as % of 2006 total economic costs	2018 benefits in M€	*% of net benefits derived from improved flight efficiency and delay*	2018 benefits as % of 2006 total economic costs
Blue Med						
Scenario min	€ 14 M		**1%**	€ 17 M		**2%**
Scenario max	€ 49 M		**5%**	€ 71 M		**7%**

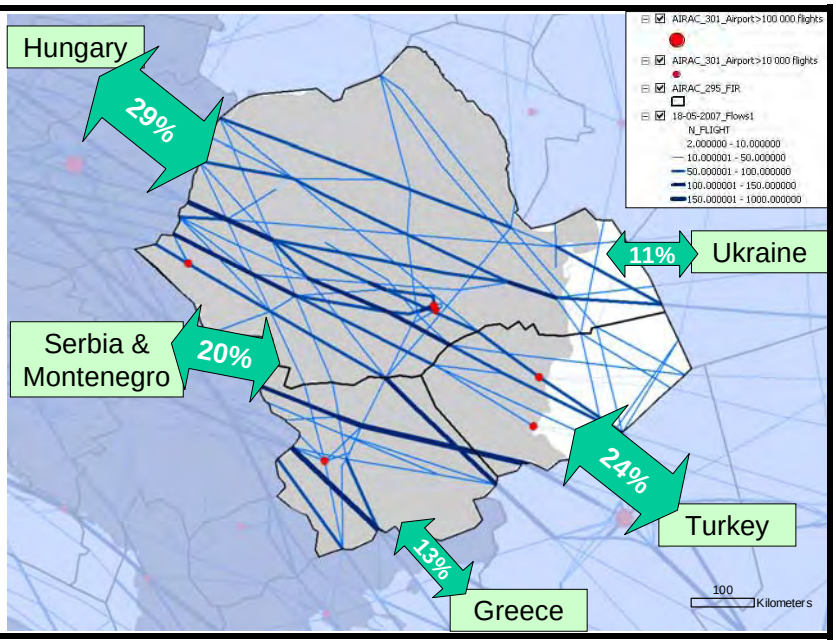
A High Level Economic Appraisal, which is not intended to be a formal CBA, was conducted as part of the Feasibility Study. A detailed CBA will be conducted as part of the Definition Phase. It is not fully clear what assumptions have been made or what costs and benefits have been taken into account. Data reported in the HLEA should be considered only as indicative The overall benefits as percentage of the 2006 total economic costs remain very modest.

Danube

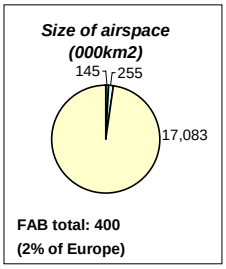
ATSA Bulgaria, ROMATSA (Romania)

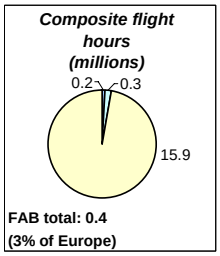
The Bulgaria-Romania FAB initiative has been instigated by its Air Navigation Service Providers (ANSPs) – ATSA Bulgaria and ROMATSA in Romania. It was started in 2004, having been created inside the Memorandum of Understanding for ATM cooperation in South-Eastern Europe (ACE) signed in 2003. It was originally envisaged that the programme would also include Turkey and Moldova. The FAB initiative has been presented to the other Parties of the ACE MoU.

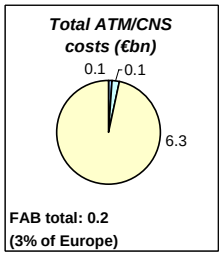
In 2004 the working arrangements and terms of reference for the initiative were established by the two ANSPs. It was at that time named the BULROM FAB, which was renamed the Danube FAB in 2007.

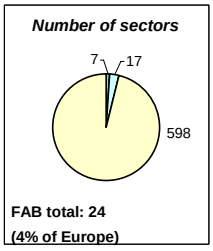


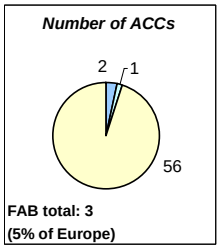
Size of FAB

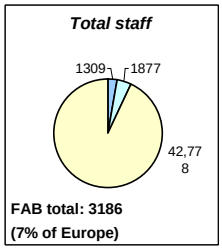


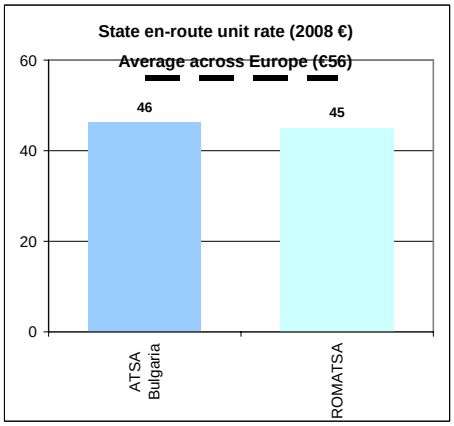






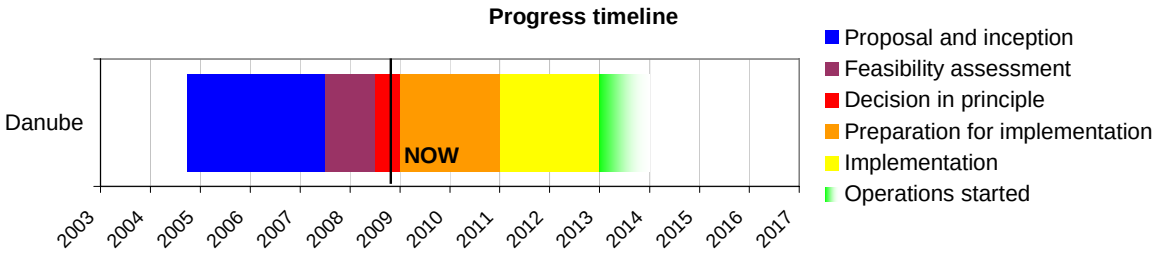






Data taken from ACE Report for 2006

Timescales

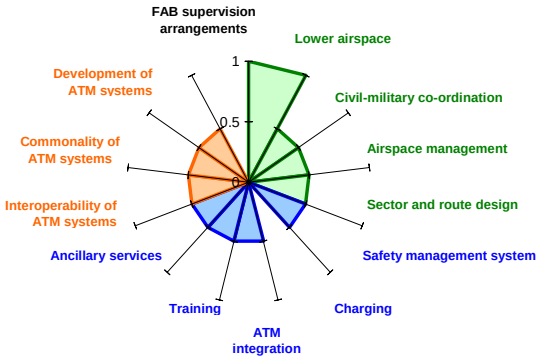


Proposal and Inception: October 2004;
Pre-feasibility phase: February 2005-mid 2007
Feasibility assessment – Stage 1: December 2007;
ANSPs decision regarding the preferred solution: January 2008
Feasibility assessment – Stage 2: January–July 2008;
Decision: Go/no go decision at State level: end 2008;
Preparation for implementation: 2009-10 (detailed feasibility assessment);
Implementation: 2010-12 (detailed design);
Operations started: 2013.

Progress so far: A feasibility study investigating a range of issues was commissioned from outside consultants, and completed in 2008. The study proposed three scenarios, and following discussions in early 2008 the ANSPs took forward the 'co-operation scenario', involving partial integration. The establishment of a clear Danube FAB governance structure is in the process of being approved in both countries by the end of 2008. Both ANSPs applied for TEN-T funding for the development of subsequent phases in June 2008.

Proposals for the FAB

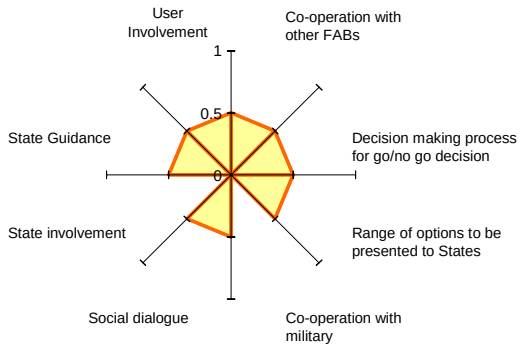
Characteristics



Characteristic	Justification
Lower airspace covered	Lower airspace included.
Civil-Military coordination	FAB is considering harmonised CIV-MIL coordination procedures, but not a single unit.
Airspace management	A sub-regional NMU function is a possibility in the medium term, but role not clear. It would be a function (co-ordinated service) not a standalone unit.
Sector and route design	Greater co-ordination but not a single unit for route or sector design.
Safety Management System	Safety enhancement through: common safety policy and procedures, however no evidence that a common safety unit is planned
Charging	Feasibility study recommended retaining national unit rates, but with common performance targets
ATM integration	Harmonization of operational procedures considered
Training	Some integrated management and co-ordination of training.
Ancillary services	Feasibility study recommended harmonisation of AIS and MET information and processes
Interoperability of ATM systems	Systems are already largely interoperable but the level of interoperability will be enhanced
Commonality of ATM systems	Harmonized HMI and identical functionality for ATM systems considered
Development of ATM systems	Joint development and procurement of some systems is planned, but in the longer term
FAB Supervision Arrangements	The two NSAs are likely to continue to supervise the FAB, for the foreseeable future.

Proposed changes: Two connected ACCs would operate as a "virtual centre", within upper and lower airspace optimised to practicable limits. Aircraft Operators would see the Bulgarian and Romanian airspace as one. All operational functions would continue to be undertaken by the two ANSPs, at least during initial implementation to 2012, but a Common Entity would be established to perform joint activities, possibly including planning, co-ordination, development of policies and procedures and external relations. This Common Entity would not have executive powers. After 2012, there may be additional development of common functions, possibly including: Flow and Capacity Management, Airspace Management cell, and training of ATCOs. The FAB intends to take an evolutionary approach to developing common functions.

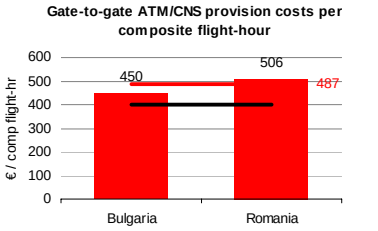
Arrangements



Arrangement	Justification
Co-operation with other FABs	Bulgaria and Romania are both members of the ISIS initiative (formerly SEE FABA) but no evidence of co-operation with other FABs.
Decision making process for go/no go decision	At present certain elements of the decision making process are identified, for instance the two levels of decision, of ANSPs' and States', regular meetings between DGs of the two ANSPs, etc
Range of options to be presented to States	Three organisational scenarios were developed for the initial phase to the same degree of detail but only one of these, the 'Partial Integration' option, has been assessed.
Co-operation with military	Some involvement in meetings and stakeholder consultation but limited to date.
Social dialogue	Social dialogue is seen as a critical factor for success and a dedicated WG is set up. However, staff representatives believe that social dialogue has been limited.
Involvement of States	Initiative has to date been led by the ANSP's consultants. There is no evidence of active involvement by the States.
Guidance from States to start and support FAB discussions	A joint statement of endorsement in 2005 and common vision for co-operation in 2006. State involvement more recently has involved endorsement of the feasibility study
Involvement of users	Consultation meetings with the users have been organised but no evidence that the design of the initiative has reflected users' concerns.

Key Performance Indicators

Economic



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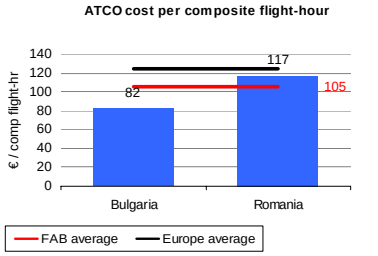

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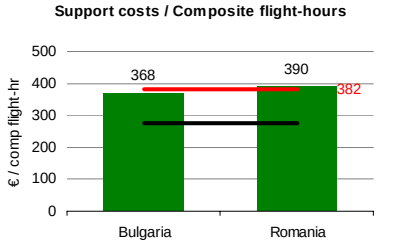
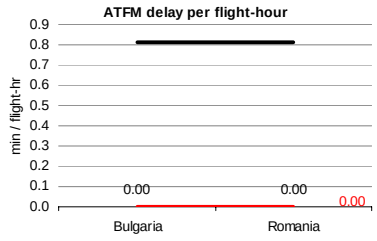


(2006 ACE Data)

Operational



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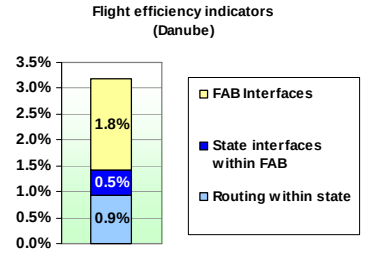
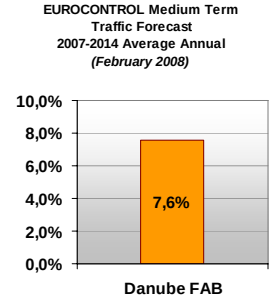


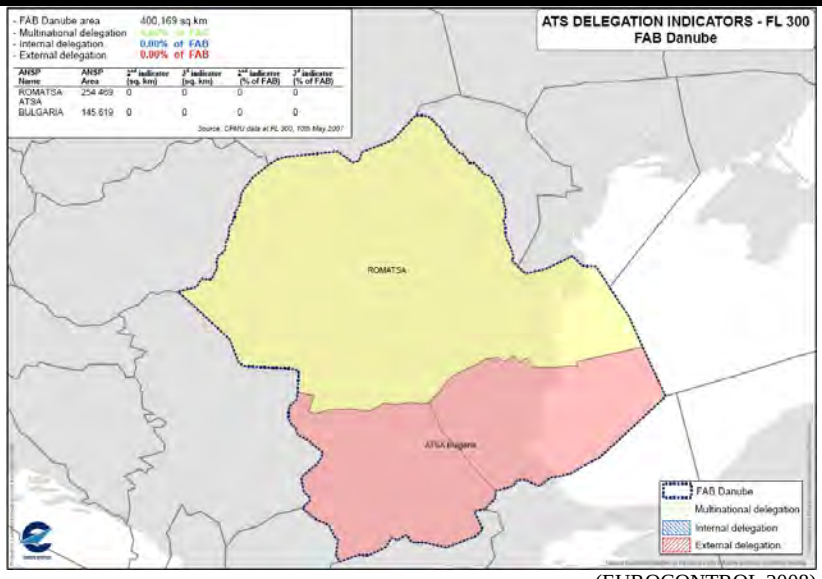
(PRU 2007)



(STATFOR Feb 2008)

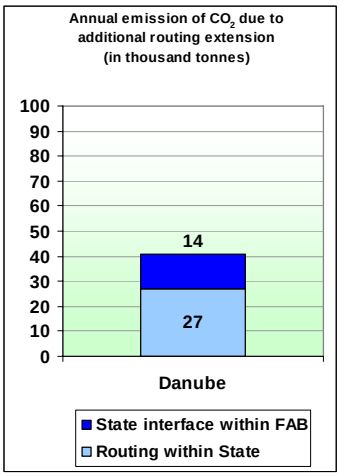
Key Performance Indicators

Operational



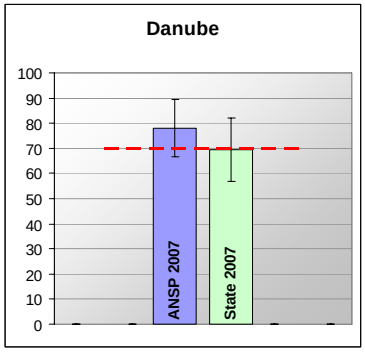
(EUROCONTROL 2008)

Environmental



(PRU 2007)

Safety



(EUROCONTROL 2008)

	ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
Due fully by:	**05-11-2007**	**01-01-2002**		**31-03-2008**	**13-07-2003**		**05-04-2004**		**11-04-2005**	
State	**Reg**	**ANSP**	**Reg**	**AST sent**	**ANSP**	**Reg**	**ANSP**	**Reg**	**ANSP**	**Reg**
Bulgaria	Partial	✓	Partial	No report	✓	Late	✓	under rev	✓	Partial
Romania	Planned	✓	✓	✓	✓	✓	✓	✓	✓	✓

(LCIP 2008-2012)

Main quantified benefits from CBA

Main quantified benefits from CBA

FAB	2013 benefits in M€	*% of net benefits derived from improved flight efficiency and delay*	2013 benefits as % of 2006 total economic costs	2018 benefits in M€	*% of net benefits derived from improved flight efficiency and delay*	2018 benefits as % of 2006 total economic costs
Danube						
Scenario 1,8%	€ 52 M	*99%*	**22%**	€ 52 M	*99%*	**22%**
Scenario 1%	€ 29 M	*98%*	**12%**	€ 29 M	*98%*	**12%**

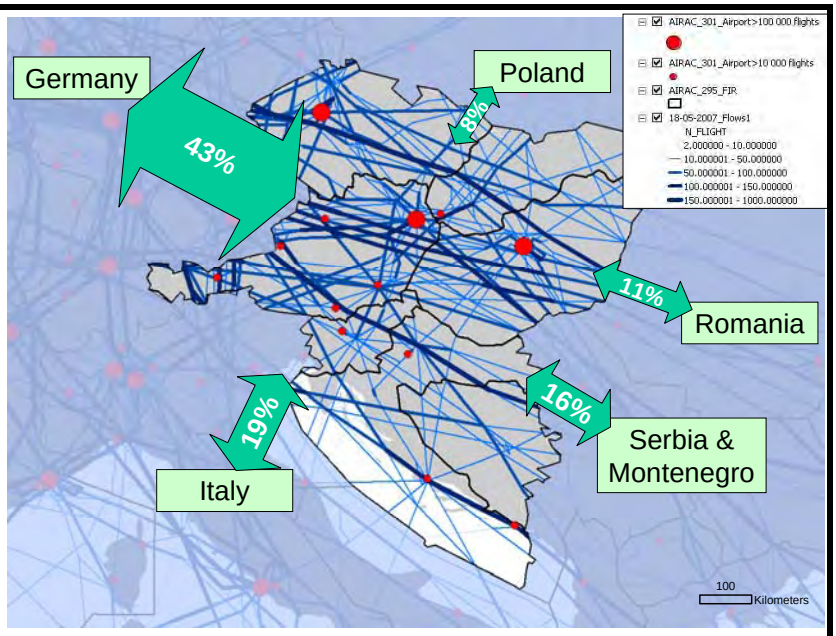
The CBA shows some significant potential quantitative benefits but is very limited, with no discussion of a reference case and no detail on the assumptions regarding financial costs and benefits. The other savings are based on two sensitivity tests for time/distance savings (1.8% and 1%) but without any justification being provided for the values used.

FAB CE

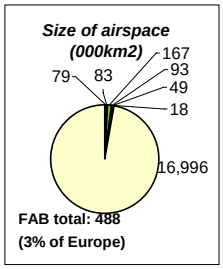
ANS CR, AustroControl, BHDCA, Croatia Control, Hungarocontrol, Letové Prevádzkové Služby (LPS), Slovenia Control

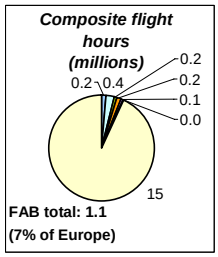
FAB CE is the successor to the CEATS initiative. Unlike many of the other FAB initiatives, it is led by the States rather than by the ANSPs. The project manager and facilitator is EUROCONTROL. A key difference with the CEATS initiative however is that FAB CE would use the existing assets of the ANSPs rather than create a new centre.

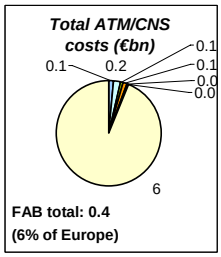
With its central position within Europe, FAB CE is bordered by a number of other FABs: Blue Med, Danube, FAB EC and Baltic.

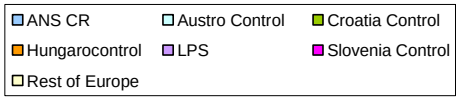


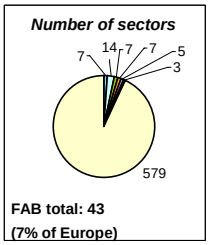
Size of FAB

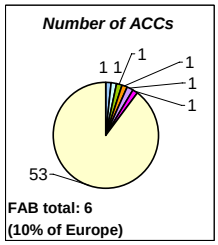


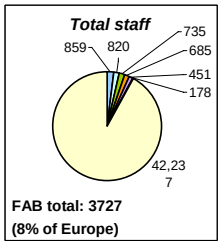


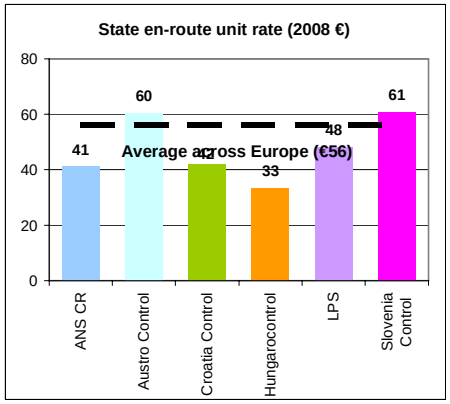






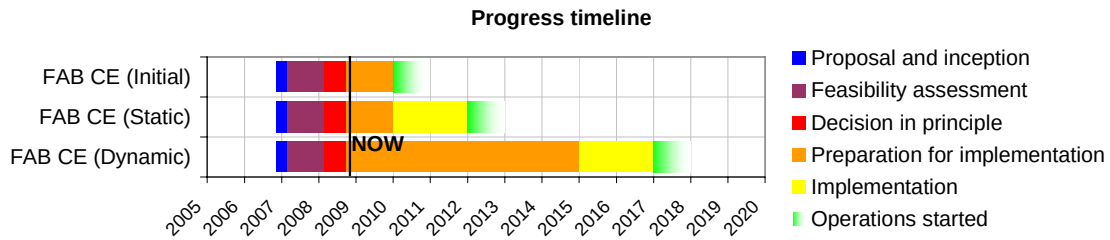






Data taken from ACE Report for 2006

Timescales

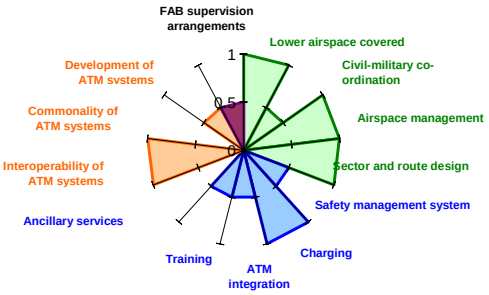


Proposal and Inception: March 2007;
Feasibility assessment: March 2008;
Decision in principle: third quarter 2008;
Preparation for implementation: 2008-09 (initial), 2008-10 (static), 2008-15 (dynamic);
Implementation: none for initial, 2010-12 (static), 2015-17 (dynamic);
Operations started: 2010 (initial), 2012 (static), 2017 (dynamic).

Progress so far: The principles for the project were established through a "common understanding" between ANSPs leading to the initiation of the Feasibility Study. The study was completed in March 2008. On 30th May 2008 a Memorandum of Cooperation was signed, followed by a declaration between the States (June 2008). A MoU between States is under development and is expected to be signed by the end of 2008.

Proposals for the FAB

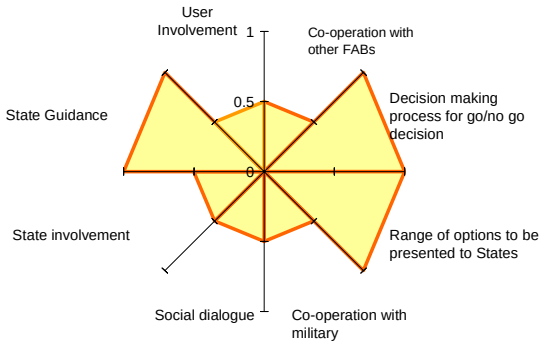
Characteristics



Characteristic	Justification
Lower airspace covered	The FAB will cover lower airspace, but not TMA or Approach
Civil-Military coordination	The FAB will establish a Joint Civil-Military Coordination Body responsible for co-ordinating airspace design
Airspace management	The FAB evaluated an option for a single Airspace Management Cell, or AMC/FMP for the whole of FAB CE airspace.
Sector and route design	Extensive cooperation of the FAB ANSPs and military providers, through JCAMB in airspace and route design and coordinated ATFCM/AS, resulting in a comprehensive re-sectorisation of the airspace.
Safety Management System	Common procedures and principles would be introduced but there is no intention to introduce a common safety unit
Charging	It is within the scope of the feasibility study to discuss all options, including a single unit rate.
ATM integration	Some of the options consider some service provision integration.
Training	In scope, looking at shared use of training facilities and staff, but unlikely to result in a single training centre in the short term
Ancillary services	The feasibility study considered common AIS/MET interface to ATM but no integration
Interoperability of ATM systems	Examining an interoperable FDP and HMI is in scope
Commonality of ATM systems	There is no evidence that enhanced commonality of systems will result from the implementation of the FAB
Development of ATM systems	A common system across the FAB is not in scope; however, specifications or developments are investigated for particular areas (ASM/ATFCM, datalink, etc.)
FAB Supervision Arrangements	The FAB will establish a NSA coordination committee

Proposed changes: The FAB CE initiative is the successor to the CEATS project. Before FAB CE, the purpose of CEATS was the development of a consolidated facility for ATS provision, to be located in Vienna. This was replaced by the goal of full use of existing and planned infrastructure with responsibilities for service provision entrusted to national ANSPs. FAB CE would concentrate on effective utilization of existing infrastructure. The feasibility study proposes a three-phased implementation strategy: Initial Scenario, initiating closer cooperation in all domains, especially Operations, Human resources, and Technical, focussing on satisfying the requirements of SES regulations and on establishing the legal and institutional framework for the FAB; Static Area of Responsibility (AoR) Scenario, consisting of regional cooperation in the provision of ATS, centralised planning and functional integration of ASM and ATFCM measures with extensive cross-border sectors; Dynamic AoR Scenario, involving optimisation of the use of technical and human resources using dynamic changes in the AoR.

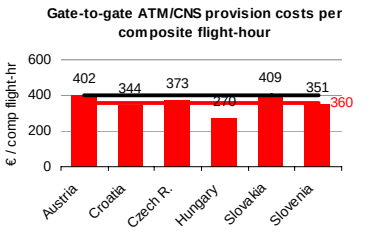
Arrangements



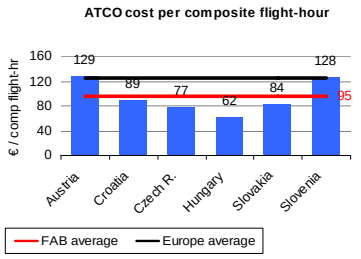
Arrangement	Justification
Co-operation with other FABs	No formal arrangements taking place, but are being facilitated through Eurocontrol. Italy observer, link into Blue Med developments
Decision making process for go/no go decision	Clear responsibilities for governance (CCG) and timetable for decision-making
Range of options to be presented to States	Range of scenarios presented in the Feasibility Study to CCG (static and dynamic scenarios)
Co-operation with military	Military representatives are involved with two working groups. However, military representatives are not directly involved in the FAB steering group
Social dialogue	Process was initiated during the Feasibility Study and is planned to continue in a more structured way during the preparation phase.
Involvement of States	The States are represented in the decision-making body through the CCG. However, need evidence that States objectives/concerns have been taken into account
Guidance from States to start and support FAB discussions	The Minister of Transport of the participating States have signed a Declaration of Intent
Involvement of users	IATA is a member of the FAB Steering Group. Austrian airlines is on two working groups. In PRC's meetings with airlines they claim that their advice has not been taken on board in the feasibility study. The inputs provided by IATA are planned to be used to refine the CBA in the next phase

Key Performance Indicators

Economic



(2006 ACE Data)



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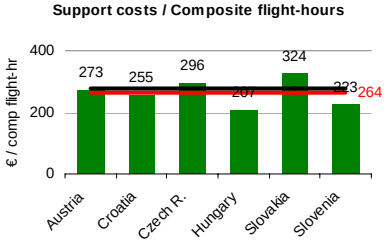
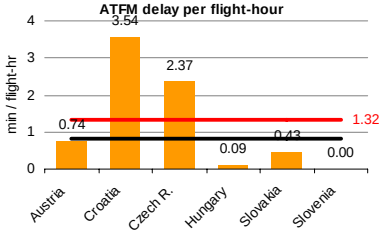
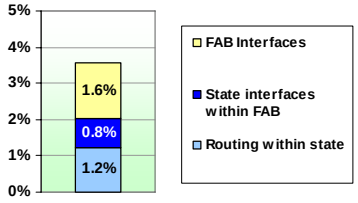


(2006 ACE Data)

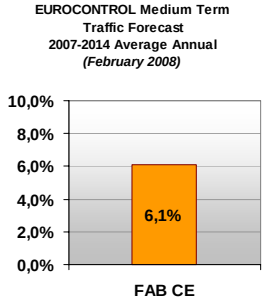
Operational



(2007 data)



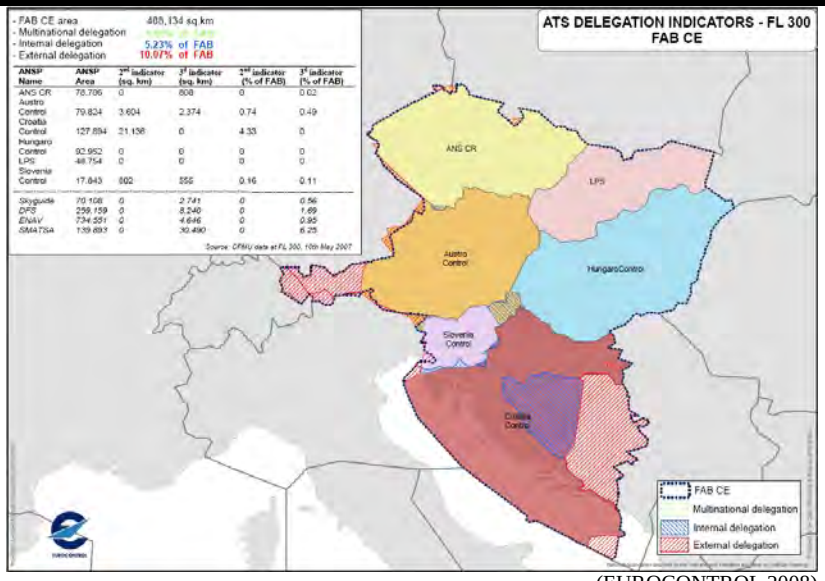
(PRU 2007)



(STATFOR Feb 2008)

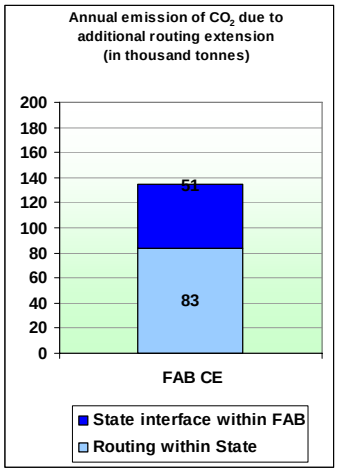
Key Performance Indicators

Operational



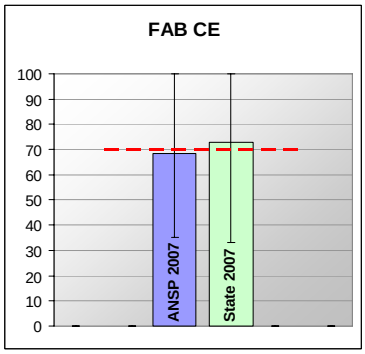
(EUROCONTROL 2008)

Environmental



(PRU 2007)

Safety



(EUROCONTROL 2008)

	ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
Due fully by:	**05-11-2007**	**01-01-2002**		**31-03-2008**	**13-07-2003**		**05-04-2004**		**11-04-2005**	
State	**Reg**	**ANSP**	**Reg**	**AST sent**	**ANSP**	**Reg**	**ANSP**	**Reg**	**ANSP**	**Reg**
Austria	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bosnia & Herzegovina	Late	Late	Late	No report	Late	Late	Late	Late	✓	✓
Croatia	✓	✓	Late	No report	✓	Late	Late	Late	✓	Late
Czech Republic	Partial	✓	✓	✓	✓	Partial	✓	Partial	✓	✓
Hungary	Planned	✓	Partial	✓	✓	Partial	✓	Partial	✓	✓
Slovakia	Late	✓	✓	✓	✓	✓	✓	Late	✓	✓
Slovenia	✓	✓	✓	No report	✓	✓	✓	Late	Late	Late

(LCIP 2008-2012)

Main quantified benefits from CBA

Main quantified benefits from CBA

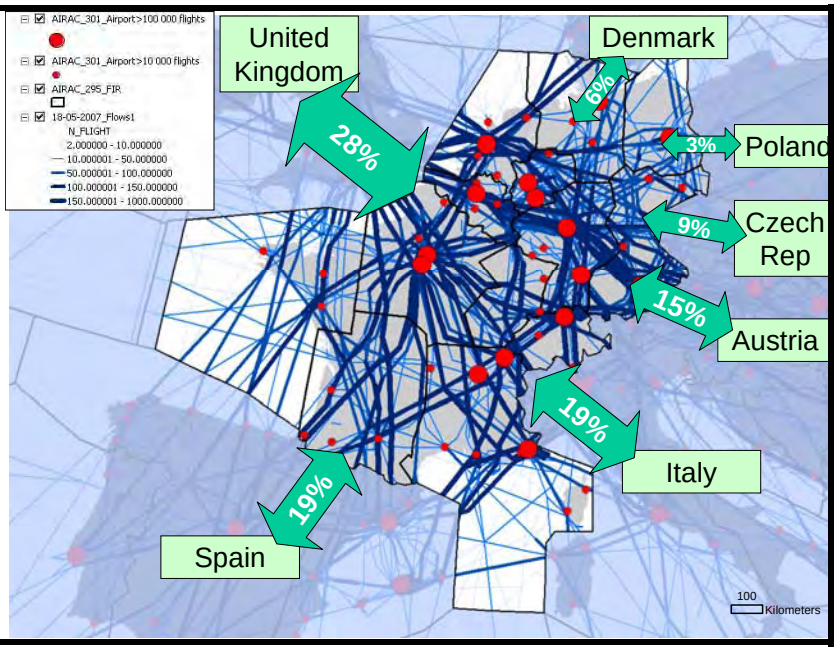
FAB	2013 benefits in M€	*% of net benefits derived from improved flight efficiency and delay*	2013 benefits as % of 2006 total economic costs	2018 benefits in M€	*% of net benefits derived from improved flight efficiency and delay*	2018 benefits as % of 2006 total economic costs
FAB CE						
Static	€ 6 M	*53%*	**1%**	€ 30 M	*55%*	**6%**
Dynamic (big bang)	€ 6 M	*53%*	**1%**	€ 21 M	*55%*	**4%**
Dynamic (gradual)	€ 6 M	*53%*	**1%**	€ 27 M	*55%*	**5%**

This CBA provides a clear, detailed reference case. However, the results are dependent on a number of expert assumptions, some of which are open to question, and which have a substantial impact on the results.
The overall benefits as percentage of the 2006 total economic costs remain very modest.

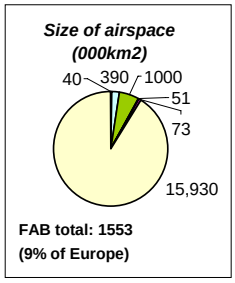
FAB EC

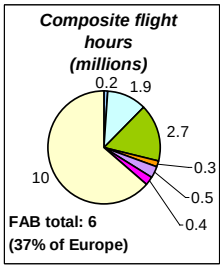
DFS, DSNA, Skyguide, LVNL, Belgocontrol, MUAC
(UK NATS as collaborative partner)

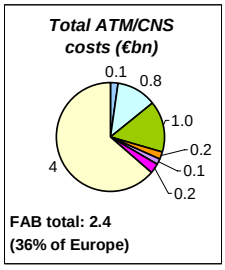
FAB EC is the largest proposed FAB (in terms of flight hours controlled). It covers several major airports, servicing dense terminal and en-route traffic flows; the core area around Brussels, Frankfurt, London, Paris and Schiphol; and crowded airspace in Switzerland. There are closely interlaced civil and military traffic routes, and civil and military airports situated next to borders. Several military training areas are established amidst major pan-European air traffic flows.
The UK is a collaborative partner to FAB EC (involving State, Regulator and ANSP), and special consideration will be given to the area to the southeast of London when addressing airspace design.

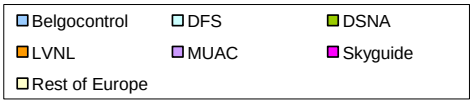


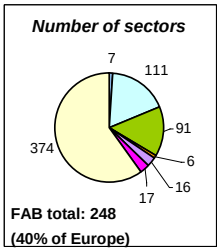
Size of FAB

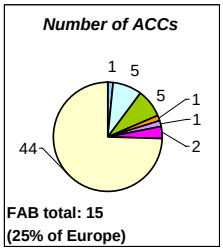


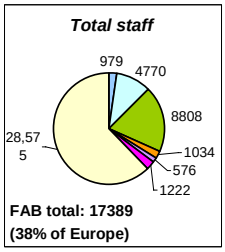


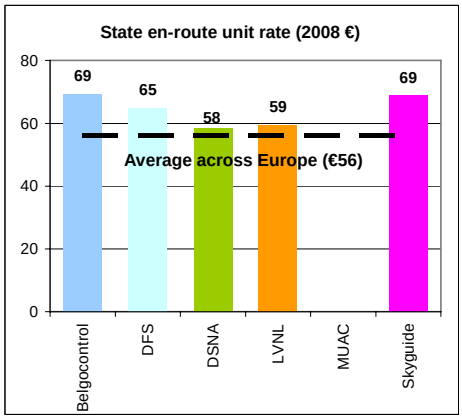






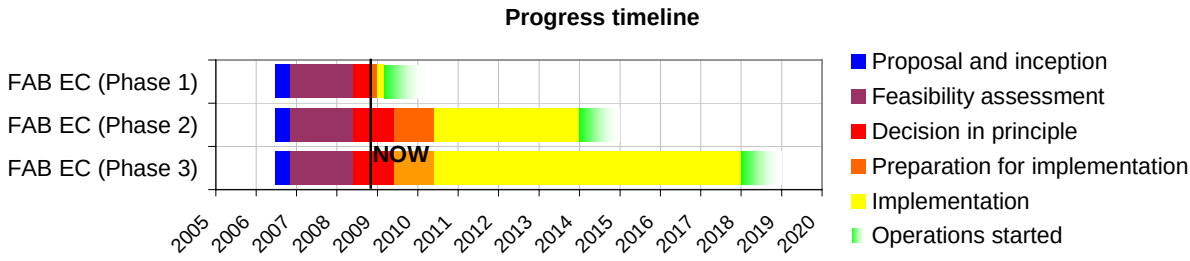






Data taken from ACE Report for 2006

Timescales

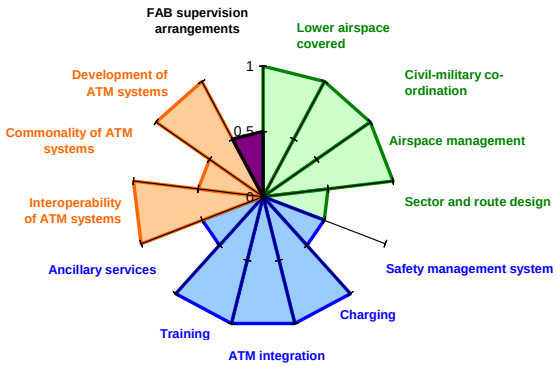


Proposal and Inception: November 2006;
Feasibility assessment: February - June 2008;
Decision in principle: November 2008 (declaration of intent), 2010 (treaty between States ready for signature);
Preparation for implementation: late 2008 for Phase 1, mid 2009 to mid 2010 for Phases 2 and 3;
Implementation: early 2009 for Phase 1, mid 2009 to mid 2010 for Phases 2 and 3;
Operations started: early 2009 for Phase 1, 2014 for Phases 2, 2018 for Phase 3.

Progress so far: Two previous FAB projects were initiated in 2005: Germany, Belgium, Netherlands and Luxembourg; France and Switzerland. In autumn 2006, the projects were reoriented to combine the membership, including MUAC. The Feasibility Study Report was completed in July 2008, identifying possible areas for cooperation between ANSPs to improve performance. The CBA reported on the results of the cooperation model, indicating separately additional benefits from other models.

Proposals for the FAB

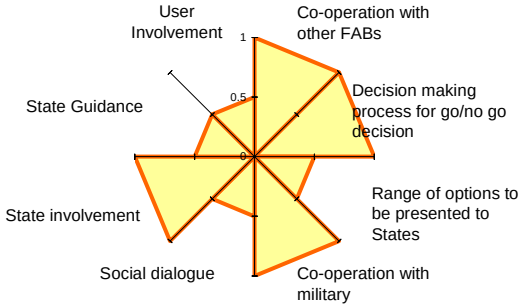
Characteristics



Characteristic	Justification
Lower airspace covered	Airspace will be vertically integrated
Civil-Military coordination	Considering advance FUA levels 1-3, joint civil/military ATFCM=ASM, and joint ASM in real time.
Airspace management	Plan to establish a FAB ATFCM-ASM function to co-ordinate and optimise capacity provision, traffic flows and use of airspace for the entire FAB
Sector and route design	This will be integrated but not yet clear if a single unit or integrated function/approach will be pursued will be implemented in medium/ long term
Safety Management System	Seeking common safety management system. Will only develop common SMS unit if institutional arrangements allow
Charging	Long term objective is uniform unit rate
ATM integration	Optional single ANSP model considered subject to further investigation
Training	Cooperation intended in training. Single training organisation not considered till after 2020 for ATCOs but for ATSEP and Military earlier
Ancillary services	Concepts for AIS and MET under development
Interoperability of ATM systems	Cooperation intended in technical systems to facilitate interoperability
Commonality of ATM systems	Gradual progression towards common specification and architecture (FDP)
Development of ATM systems	There is an aspiration for common procurement and development which will incrementally be developed for the FAB
FAB Supervision Arrangements	A FAB NSA is identified in the roadmap to mature over the period 2008-13, however details are not provided in the feasibiltiy study

Proposed changes: Airspace redesign planned to take place in three stages: (1) address 'hotspots', (2) re-sectorise/re-optimise location of military areas, (3) introduce tailored routes in very high airspace (post-2018). Single unit rate planned, however this view may change. Single charging zone and single unit rate introduced before operational improvements to 'hotspots'. Individual safety management systems (SMS) initially, however in future common SMS is hoped for. Various other operational changes intended: aeronautical information services (AIS); meteorological services; contingency; co-ordinated training ANSPs, where possible harmonised ATCO training. Number of ACCs is not expected to change, in the absence of clear guidance from States on the issue.

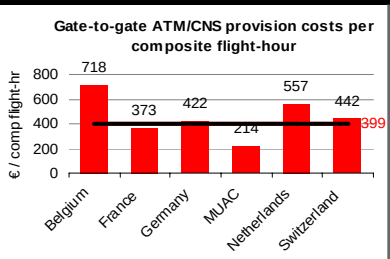
Arrangements



Arrangement	Justification
Co-operation with other FABs	Working closely with UK-IR and Blue Med, co-ordination with FAB CE
Decision making process for go/no go decision	Clear responsibilities for governance (High Level Policy Group). States agreed to sign Declaration of intent and to declar FAB in 2011/12
Range of options to be presented to States	In some areas there will be multiple proposals, in other areas only 1. The feasibility study will not present fundamentally different institutional models
Co-operation with military	Civil/military working group has been established
Social dialogue	Some trade union involvement, however they consider still room for improvement
Involvement of States	States involved in High Level Policy Group and Steering Group and within some of the working groups. Will be involved with SSB, HLIB and FPSG.
Guidance from States to start and support FAB discussions	Have received guidance and clear targets, but are some areas further guidance is required e.g. mechanism for convergence costs.
Involvement of users	FAB has consulted extensively with user. No evidence provided that the FAB have responded to users concerns

Key Performance Indicators

Economic



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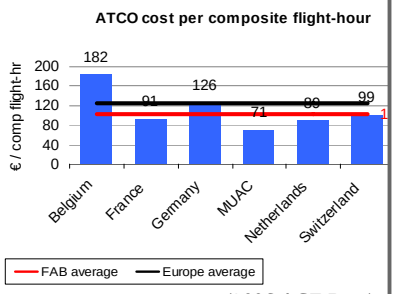

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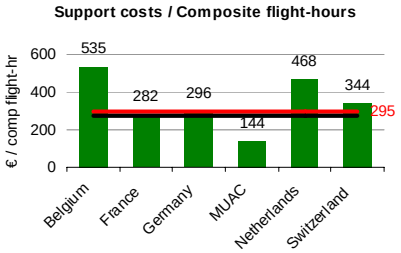
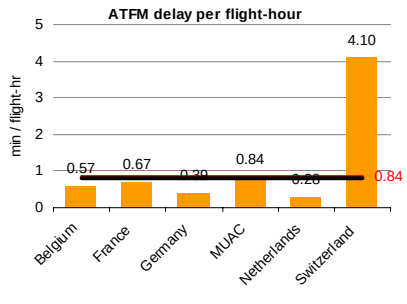


(2006 ACE Data)

Operational



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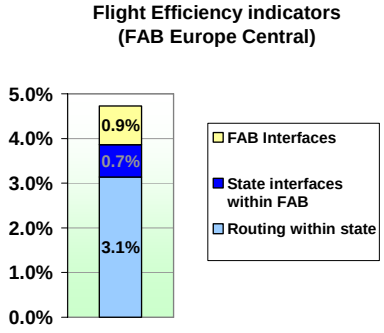
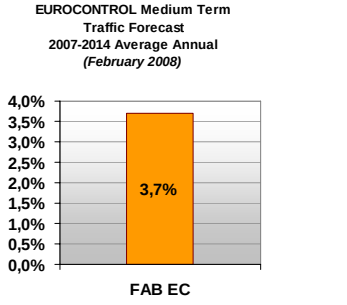


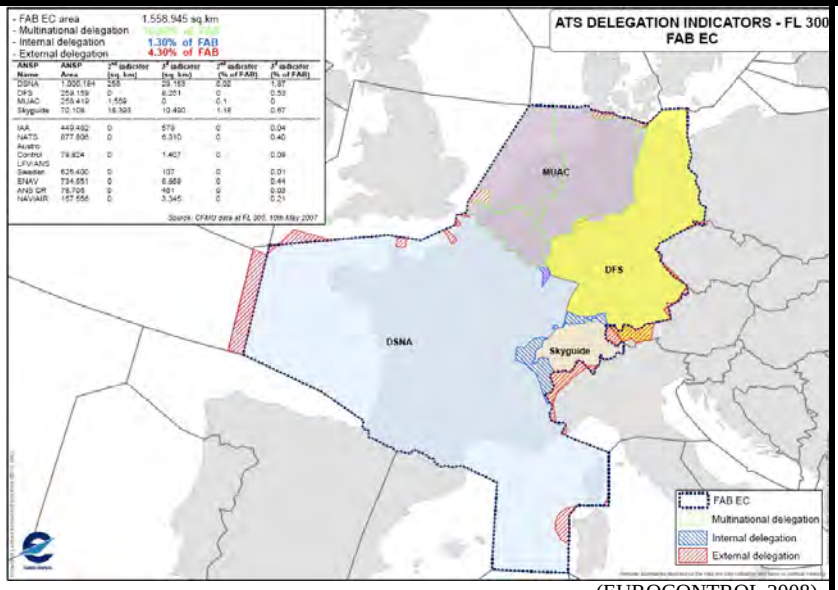
(PRU 2007)



(STATFOR Feb 2008)

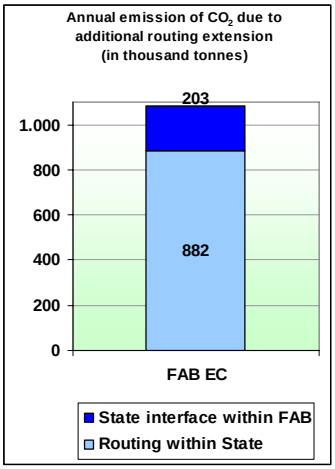
Key Performance Indicators

Operational



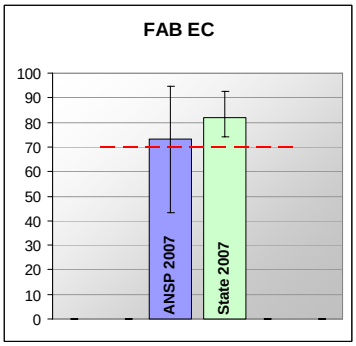
(EUROCONTROL 2008)

Environmental



(PRU 2007)

Safety



(EUROCONTROL 2008)

	ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
Due fully by:	**05-11-2007**	**01-01-2002**		**31-03-2008**	**13-07-2003**		**05-04-2004**		**11-04-2005**	
State	**Reg**	**ANSP**	**Reg**	**AST sent**	**ANSP**	**Reg**	**ANSP**	**Reg**	**ANSP**	**Reg**
Belgium	Partial	✓	✓	✓	✓	✓	✓	Late	✓	Partial
France	✓	✓	✓	✓	✓	✓	✓	✓	Late	Partial
Germany	✓	✓	✓	✓	✓	✓	✓	Partial	✓	Partial
Luxembourg	Partial	✓	✓	No report	✓	✓	✓	Partial	✓	Partial
Netherlands	Partial	✓	Late	✓	✓	Partial	✓	Partial	✓	Partial
Switzerland	Partial	✓	✓	✓	✓	✓	✓	Partial	✓	Late

(LCIP 2008-2012)

Main quantified benefits from CBA

Main quantified benefits from CBA

FAB	2013 benefits in M€	*% of net benefits derived from improved flight efficiency and delay*	2013 benefits as % of 2006 total economic costs	2018 benefits in M€	*% of net benefits derived from improved flight efficiency and delay*	2018 benefits as % of 2006 total economic costs
FAB EC	€ 260 M	*77%*	**8%**	€ 1.150 M	*83%*	**37%**

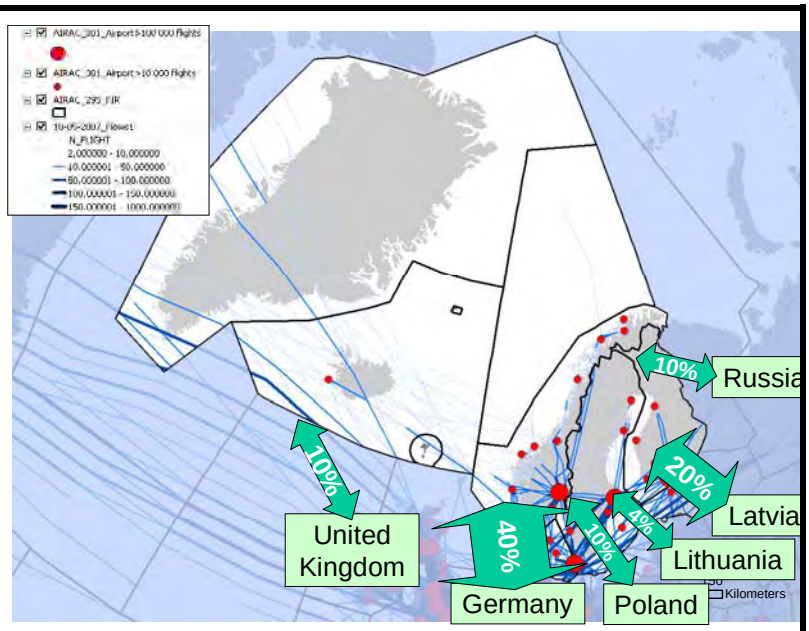
The FAB EC CBA shows the highest benefits in Europe in terms of absolute values, based on a clear and detailed reference case. The main sources of the benefits are improvements in flight-efficiency and savings from reduced delay and a reduction in unmet demand. Smaller savings are found from AIS, training, CNS, common ATM systems, MET and productivity improvements.

NEFAB

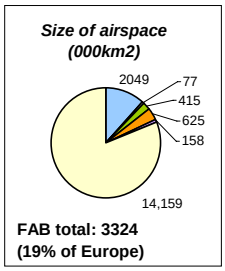
AVINOR (Norway), LFV (Sweden), Finavia (Finland), Naviair (Denmark), Estonian ANS (Estonia), ISAVIA (Iceland)

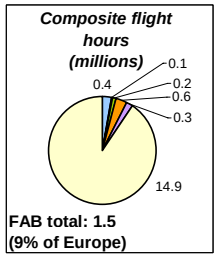
NEFAB is the most recent FAB to be established, and as such is one of the least advanced. A significant portion of the airspace is oceanic, with delegation of ATS for Greenland to Isavia and NavCanada. There are significant flows of traffic from the south to the major airports in NEFAB (Stockholm, Oslo, Copenhagen and Helsinki).

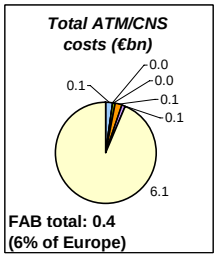
Two of the NEFAB members, Naviair and LFV/ANS, are also working together on the NUAC FAB initiative, which is considerably more advanced than NEFAB. It is envisaged that in due course NUAC is expected to be one service provider within NEFAB.

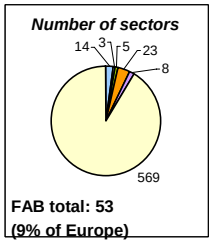


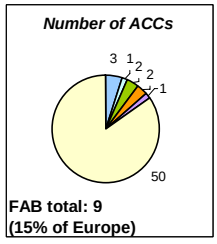
Size of FAB

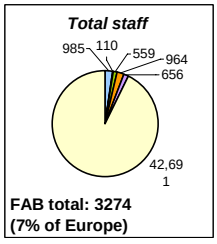


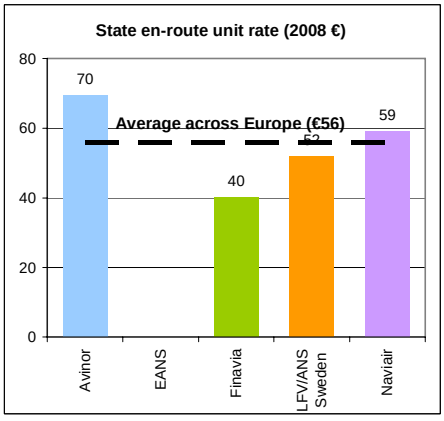






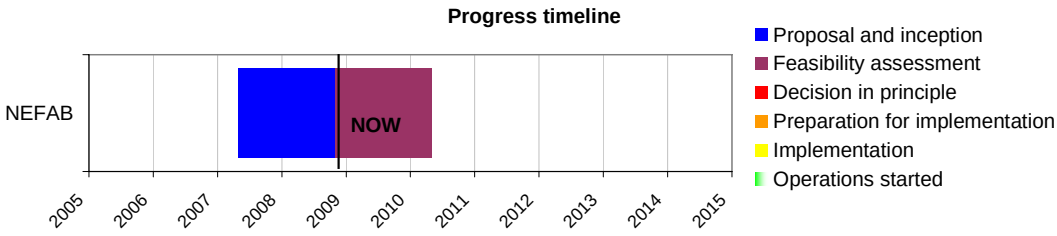






Data taken from ACE Report for 2006

Timescales

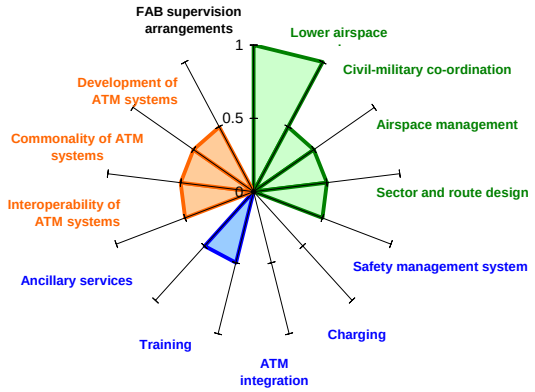


Proposal and inception: May 2007;
Feasibility assessment: May 2010;
Decision in principle: unknown;
Preparation for implementation: unknown;
Implementation: unknown;
Operations started: unknown.

Progress so far: A pre-Feasibility Study has been undertaken for NEFAB and during summer 2008 it intended to: set up a project plan for the Feasibility Study; conduct a target-based high level CBA; undertake analysis of possible showstoppers; and undertake safety analysis. In August 2008 the CEOs of the ANSPs were to make a decision based on this work as to whether to proceed with a full Feasibility Study for NEFAB to be completed by May 2010.

Proposals for the FAB

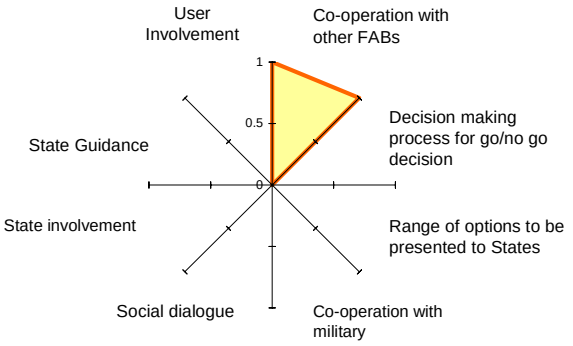
Characteristics



Characteristic	Justification
Lower airspace covered	All airspace is included except for control zones
Civil-Military coordination	Some early plans through NEAP for enhanced co-ordination, but no specific plans for a single CIV-MIL co-ordination unit
Airspace management	It is planned to establish a working group to evaluate whether a NMU for the FAB should be created
Sector and route design	Some changes to sector and route design have been identified through NEAP around the terminal areas and at the interface between Oceanic areas and Iceland
Safety Management System	Not under consideration at this stage
Charging	Not under consideration at this stage
ATM integration	Not under consideration at this stage
Training	Three NEFAB members are also participating in Entry Point North; it is also planned to harmonise training within NEFAB
Ancillary services	No plans for AIS or MET at this stage
Interoperability of ATM systems	A working group has been established to evaluate interoperability and possible joint procurement of systems
Commonality of ATM systems	A working group has been established to evaluate interoperability and possible joint procurement of systems
Development of ATM systems	A working group has been established to evaluate interoperability and possible joint procurement of systems
FAB Supervision Arrangements	Not under consideration at this stage

Proposed changes: The initiative is at a very early stage and is examining a wide range of possible improvement areas, expected to be narrowed down as the initiative develops. The initiative has currently prioritised the following areas: common airspace planning; common PANS OPS productions; joint specification and procurement of CNS/ATM systems including life cycle costs analysis and reduction; common CNS network plan; joint harmonised training; and changes to regulatory arrangements.

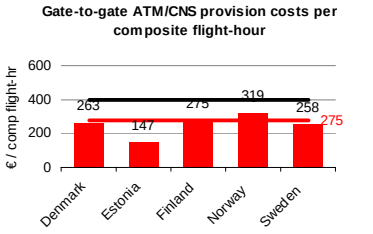
Arrangements



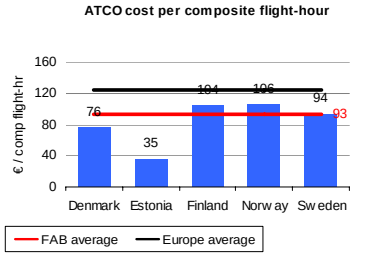
Arrangement	Justification
Co-operation with other FABs	Denmark and Sweden who are members of NEFAB are also members of NUAC; will also need to be co-operation agreements with UK/Ireland, and co-operation with Baltic planned.
Decision making process for go/no go decision	Unclear at this stage how a decision as to whether to proceed with a FAB would be made. Decision to proceed with feasibility study would be made by ANSP CEOs.
Range of options to be presented to States	Not determined at this stage.
Co-operation with military	Minimal involvement to date although some information exchange in certain States
Social dialogue	Minimal involvement to date although some information exchange in certain States
Involvement of States	Minimal involvement to date although some information exchange in certain States
Guidance from States to start and support FAB discussions	Minimal involvement to date although some information exchange in certain States
Involvement of users	Minimal involvement to date although some information exchange in certain States

Key Performance Indicators

Economic



(2006 ACE Data)



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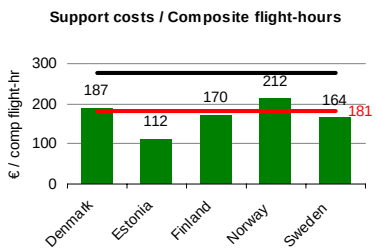
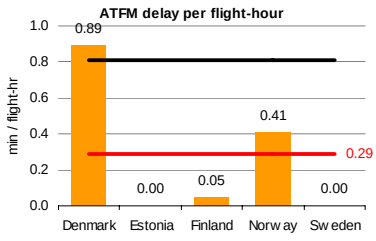


(2006 ACE Data)

Operational



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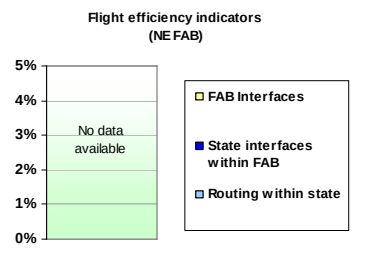
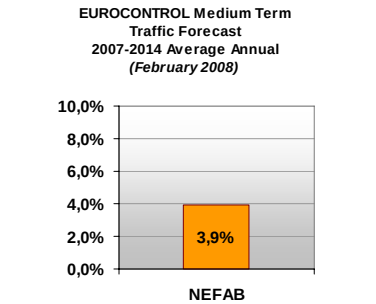


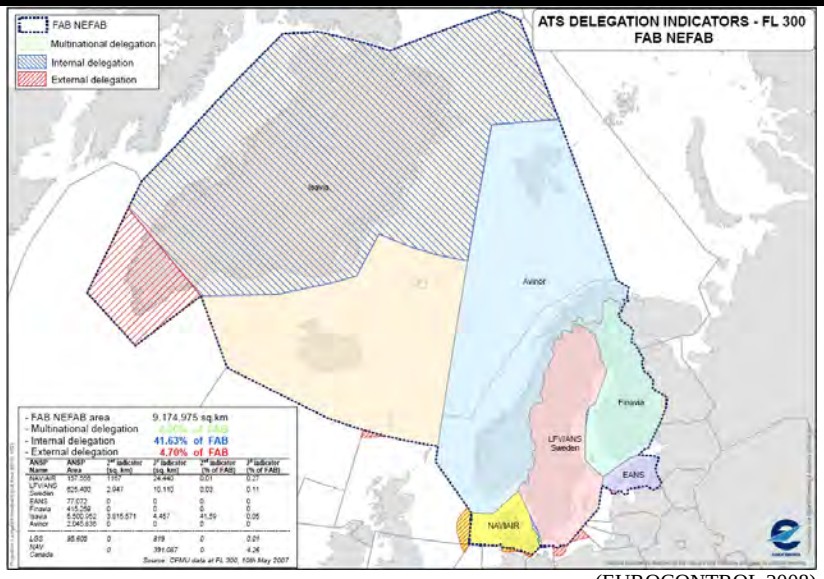
(PRU 2007)



(STATFOR Feb 2008)

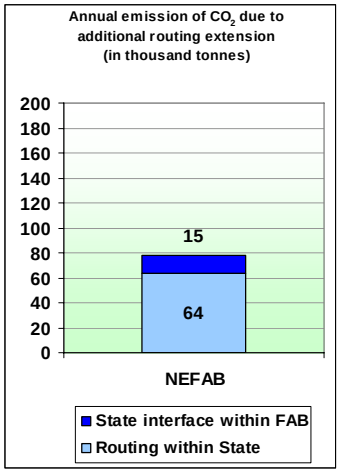
Key Performance Indicators

Operational



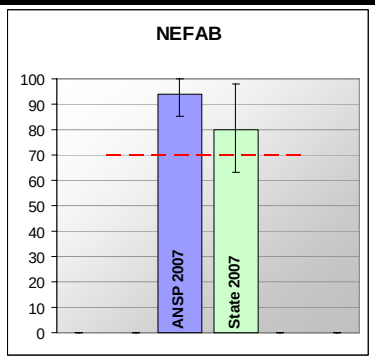
(EUROCONTROL 2008)

Environmental



(PRU 2007)

Safety



(EUROCONTROL 2008)

	ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
Due fully by:	05-11-2007	01-01-2002		31-03-2008	13-07-2003		05-04-2004		11-04-2005	
State	Reg	ANSP	Reg	AST sent	ANSP	Reg	ANSP	Reg	ANSP	Reg
Denmark	Late	✓	Partial	✓	✓	Partial	✓	Partial	✓	✓
Estonia	✓	✓	✓	✓	✓	✓	✓	Partial	✓	✓
Finland	✓	✓	✓	✓	✓	✓	✓	Partial	✓	✓
Norway	Late	✓	Late	✓	✓	✓	✓	Late	✓	✓
Sweden	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

(LCIP 2008-2012)

Main quantified benefits from CBA

Main quantified benefits from CBA

No CBA yet

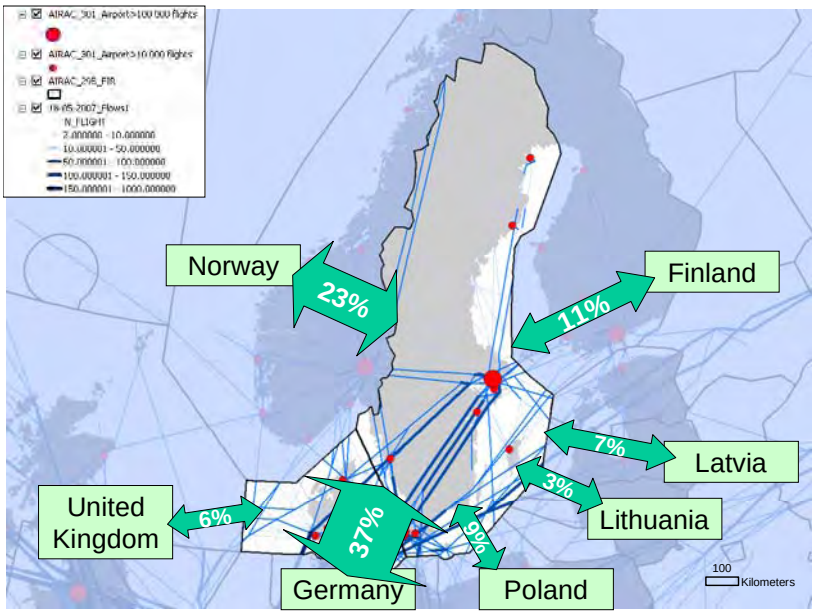
NUAC

Luftfartsverket (LFV) (Sweden),
Naviair (Denmark)

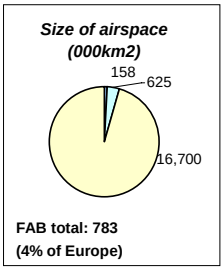
NUAC is currently one of the most advanced FAB initiatives. It is on the northern border of Europe but includes the dense airspace area around Copenhagen and Malmo. The initiative comprises two States with a history of close co-operation, and with many operational similarities. The initiative also benefits from strong political support.

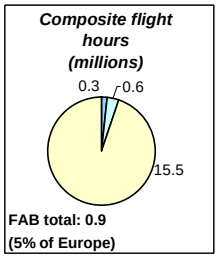
After examination of various options the ANSPs have decided to propose the implementation of the operational alliance model. At this stage, this is subject to agreement from the Member States.

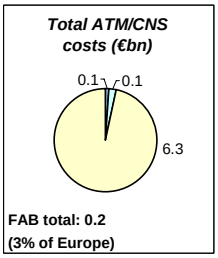
There is also presently a larger FAB initiative, NEFAB, including Denmark and Sweden as well as Norway, Finland, Iceland and Estonia. In due course, NUAC is expected to be one of the service providers within NEFAB.

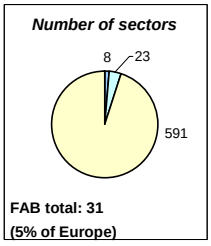


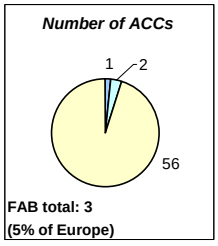
Size of FAB

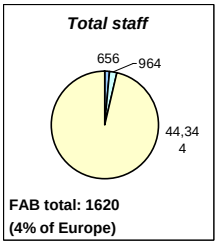


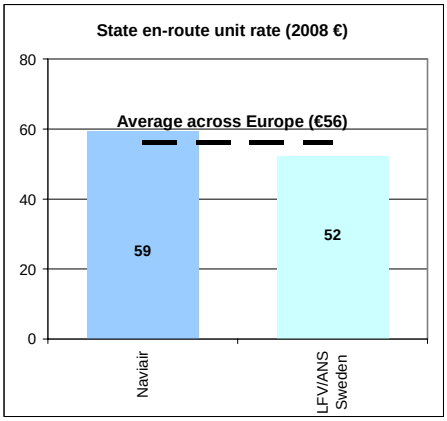






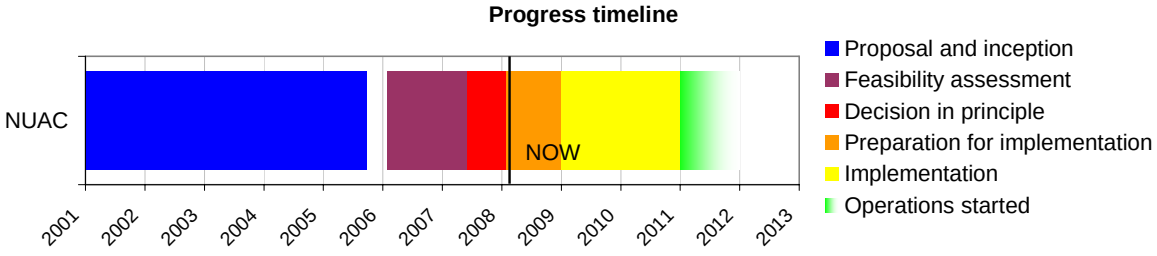






Data taken from ACE Report for 2006

Timescales

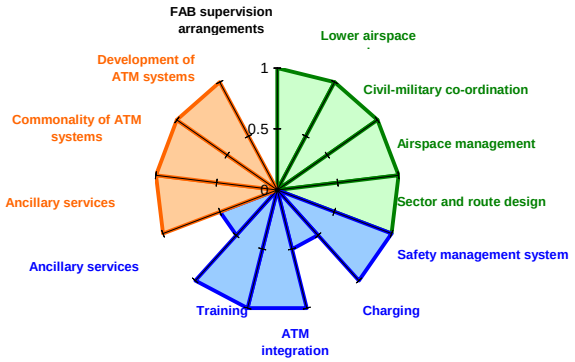


Earlier NUAC programme: To late 2005;
Proposal and Inception: February 2006;
Feasibility assessment: June 2007;
Decision in principle by the ANSPs: February 2008;
Preparation for implementation (design and development phase): February 2008-end 2008;
Implementation: 2009-2010;
Operations started: 2011 (earlier for the more limited Alliance option).

Progress so far: The programme has completed the Definition Phase, similar to feasibility studies undertaken by other FABs. This proposed four scenarios: Merger, NUAC/SKAANE, Alliance and Operational Alliance. The ANSP CEOs have now decided to proceed with the Operational Alliance option, but are awaiting a final political decision by the States. The Operational Alliance option was selected primarily because it delivers the airspace benefits of a merger, but without potential difficulties with employees resulting from a merger. NUAC also believes this option would be easier for other States to join in the future.

Proposals for the FAB

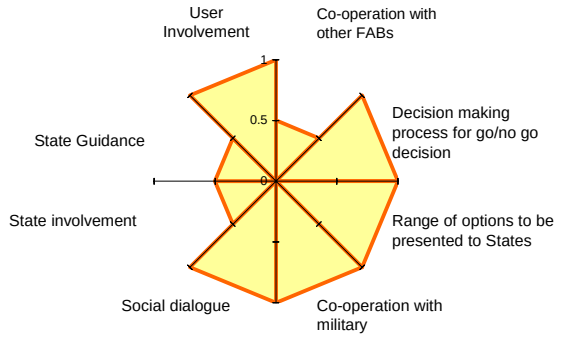
Characteristics



Characteristic	Justification
Lower airspace covered	NUAC company to provide ATM services within lower airspace to same extent as upper airspace
Civil-Military coordination	The FAB plans level 1-3 civil-military co-ordination
Airspace management	There will be one unit for management of airspace
Sector and route design	Sector and route design will be undertaken by one integrated unit.
Safety Management System	There would be a single integrated SMS for the FAB
Charging	Possibility of uniform unit rate under consideration
ATM integration	Fully integrated service provision
Training	Entry Point North to provide joint basic training, and all other training activities to take place within NUAC
Ancillary services	AIS will be provided by the NUAC Company; MET and AIS by the parent organisations
Interoperability of ATM systems	COOPANS project and other initiatives will make systems interoperable
Commonality of ATM systems	COOPANS project and other initiatives establish common systems
Development of ATM systems	COOPANS would involve the joint development of ATM systems
FAB Supervision Arrangements	To be determined during Design and Development phase

Proposed changes: LFV/ANS and Naviair would be co-owners of a NUAC Company carrying out the provision of ANS within Danish and Swedish fully integrated airspace. The NUAC Company will be certified as the ATS provider. The parent organisations, Naviair and LFV, will still own the infrastructure which will probably be leased to NUAC, and there will be some type of service level agreement. The parent organisations will be certified / designated as the ATS provider and will also provide MET and lead strategy development work. The Company would provide all ANS except MET, AIS and TWR. Support functions would be provided by the NUAC Company. The Operational Alliance scenario has the same airspace design as the Merger scenario: Malmö is assumed to be the en-route centre, with two Terminal Radar Approach Controls at Copenhagen/Malmö and Stockholm. However, some flexibility is assumed around these designations. In parallel to the programme are two other Denmark-Sweden cross-border initiatives, which are not part of the NUAC Programme, but are considered necessary for it. The programmes are: COOPANS, an 18-monthly systems upgrade for participating ANSPs, with IAA and Thales; Entry Point North, a Nordic ATS training academy, with Avinor.

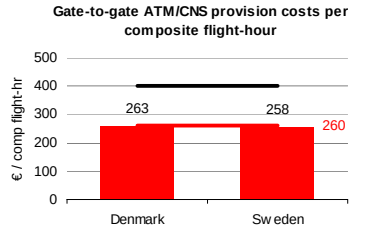
Arrangements



Arrangement	Justification
Co-operation with other FABs	Some co-operation with NEFAB, and FAB EC.
Decision making process for go/no go decision	Terms of reference and decision landscape give detailed description of process
Range of options to be presented to States	Three options fully developed for presentation to states, NUAC/SKAANE option development halted
Co-operation with military	Military involved in regular meetings with Coordination Groups, contributed to Definition Phase report
Social dialogue	Social partners involved in regular meetings with Coordination Groups, contributed to Definition Phase report
Involvement of States	States involved in regular meetings with Coordination Groups and contributed to Definition Phase report, but no day-to-day involvement in the initiative
Guidance from States to start and support FAB discussions	Clear political guidance was given by States, but no detailed targets or objectives were set
Involvement of users	Airspace users involved in regular meetings with Coordination Groups, contributed to Definition Phase report

Key Performance Indicators

Economic



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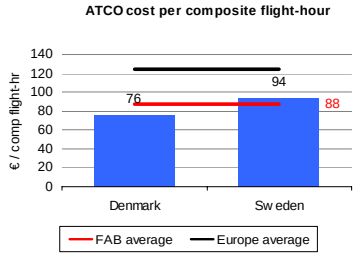

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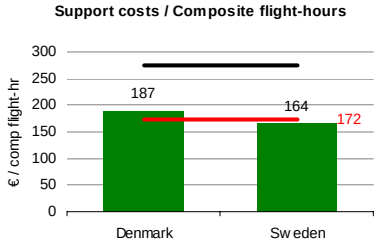

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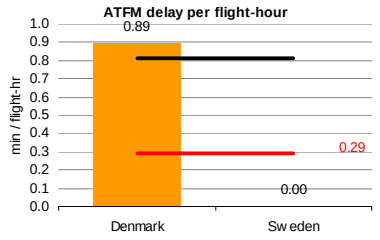
Operational



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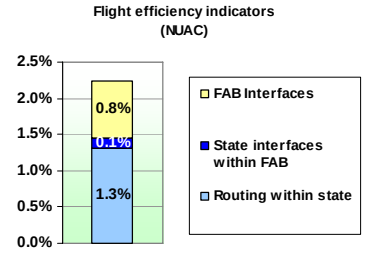
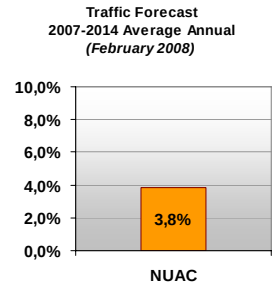


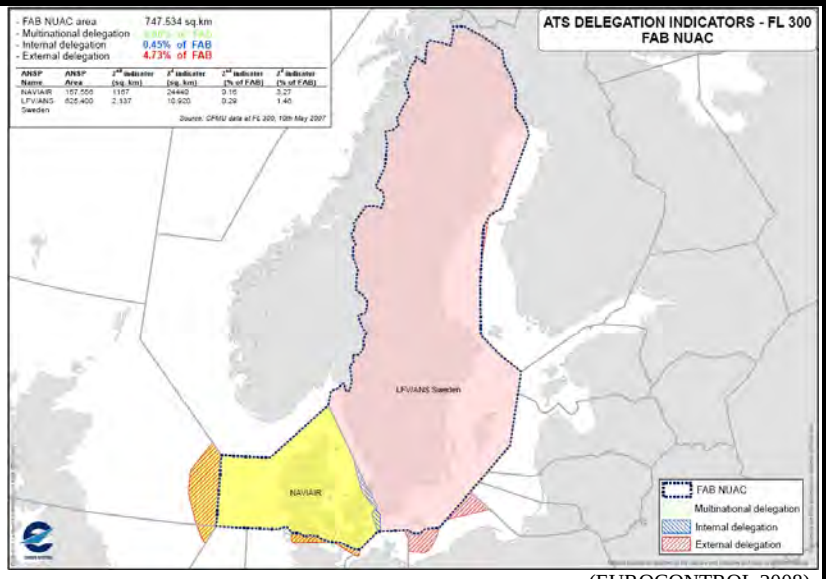
(PRU 2007)



(STATFOR Feb 2008)

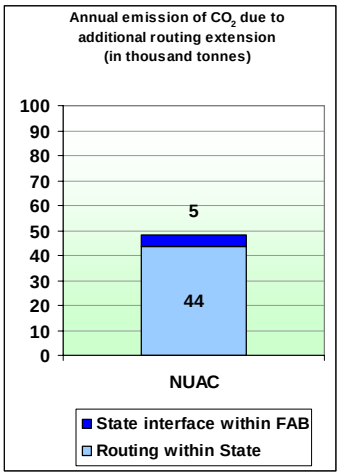
Key Performance Indicators

Operational



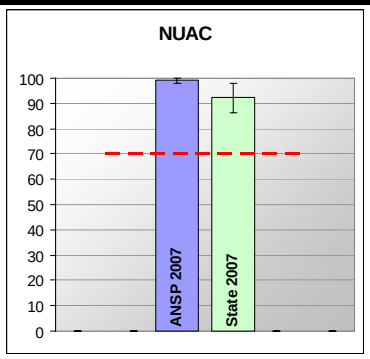
(EUROCONTROL 2008)

Environmental



(PRU 2007)

Safety



(EUROCONTROL 2008)

	ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
Due fully by:	**05-11-2007**	**01-01-2002**		**31-03-2008**	**13-07-2003**		**05-04-2004**		**11-04-2005**	
State	**Reg**	**ANSP**	**Reg**	**AST sent**	**ANSP**	**Reg**	**ANSP**	**Reg**	**ANSP**	**Reg**
Denmark	Late	✓	Partial	✓	✓	Partial	✓	Partial	✓	Partial
Sweden	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

(LCIP 2008-2012)

Main quantified benefits from CBA

Main quantified benefits from CBA

FAB	2013 benefits in M€	*% of net benefits derived from improved flight efficiency and delay*	2013 benefits as % of 2006 total economic costs	2018 benefits in M€	*% of net benefits derived from improved flight efficiency and delay*	2018 benefits as % of 2006 total economic costs
NUAC	€ 47 M	*72%*	**18%**	€ 51 M	*81%*	**18%**

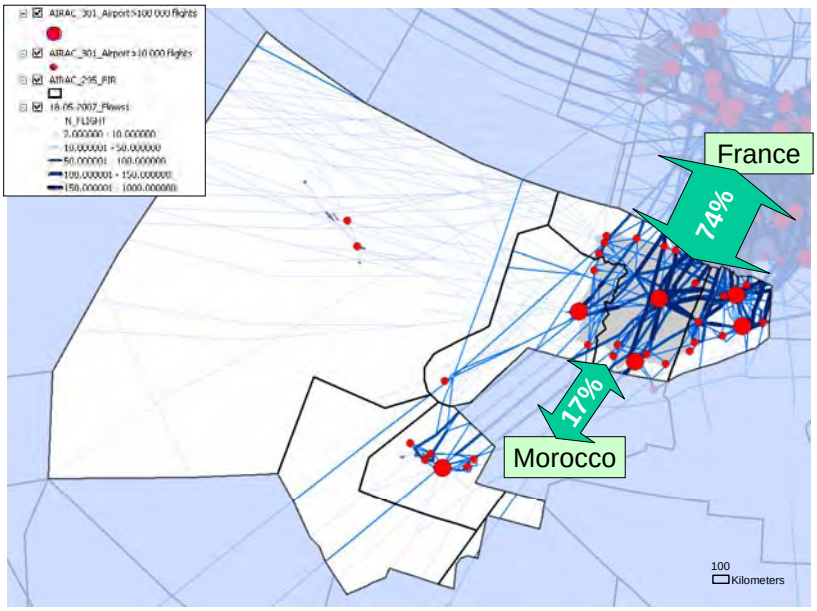
The NUAC CBA shows the highest benefits in Europe in terms of relative values. The NUAC business case documentation provides a very detailed financial assessment of the initiatives that would be undertaken as part of the FAB. However, the socio-economic analysis is more limited. The reference case is simple, assuming continuation of the current route network with no change in excess distance or delay per flight, and the analysis is based on extrapolation of a simulation of changes to the network covering one day only.

SW Portugal-Spain

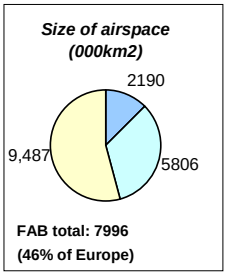
AENA (Spain), NAV Portugal

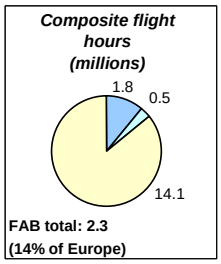
The Spain-Portugal FAB was instigated by its ANSPs – NAV Portugal in Portugal and AENA. It would cover all Spanish and Portuguese airspace including the Canary Islands and the Santa Maria FIR.

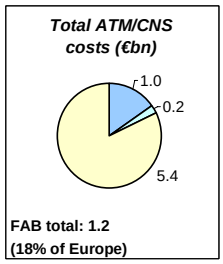
The area would handle both continental and oceanic flows, and the traffic for major airports on the peninsula: Madrid, Barcelona, Málaga and Lisbon. In addition, there are major flows to the Balearic and Canary Islands and the Azores. Significant growth is forecast, with Madrid predicted to become the third busiest airport in Europe by the end of 2012.

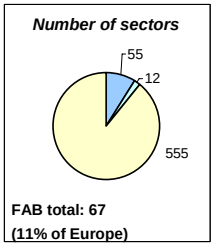


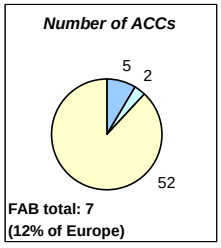
Size of FAB

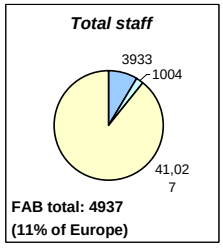


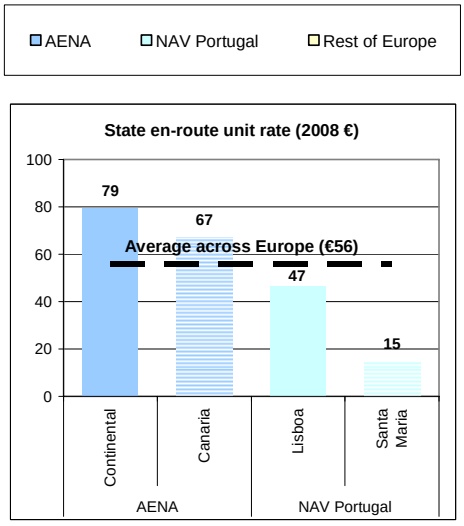






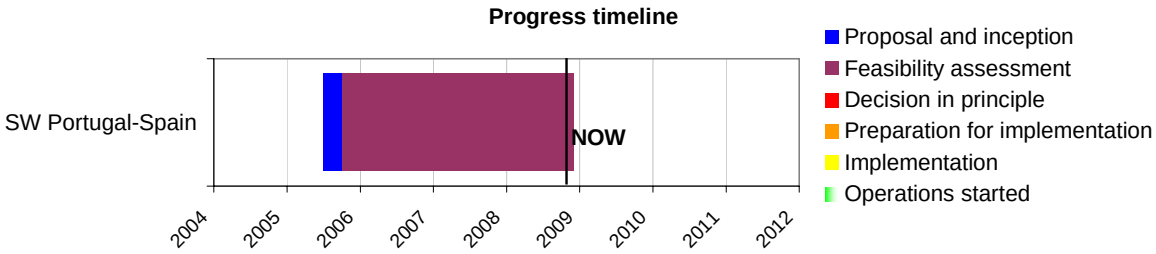






Data taken from ACE Report for 2006

Timescales

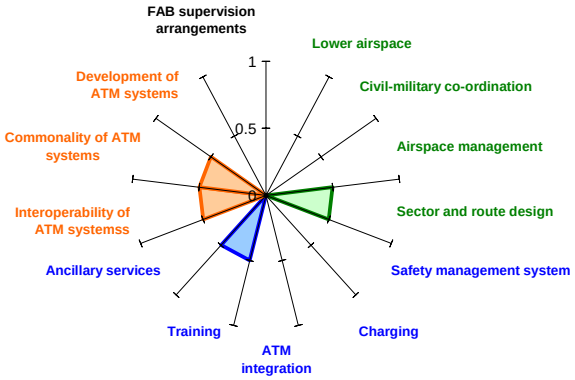


Proposal and Inception: July 2005;
Go/no-go decision: October 2008;
Feasibility assessment: not before the end of 2009;
Decision in principle: to be scheduled after States' decision;
Preparation for implementation: to be scheduled after States' decision;
Implementation: to be scheduled after States' decision;
Operations started: to be scheduled after States' decision.

Progress so far: A work programme was agreed in October 2005, and a feasibility study started. Steering structures and bodies were established, and initial data compilation was completed. Results of the study were expected in 2008, but the project was put on hold until a revised letter of intent was agreed on 29 February 2008. The letter of intent provides an objective to present an option to the States by October 2008. In October 2008, both CEOs decided to launch a feasibility study in 2009.

Proposals for the FAB

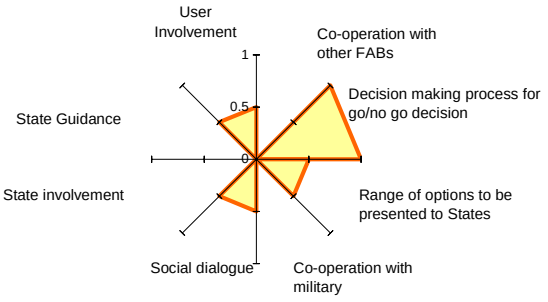
Characteristics



Characteristic	Justification
Lower airspace covered	Under review, not yet concluded
Civil-Military coordination	Early stages of feasibility
Airspace management	Early stages of feasibility
Sector and route design	A task force is in place to examine opportunities for adjustment to boundaries to allow improved cross-border flows
Safety Management System	Early stages of feasibility
Charging	Not yet addressed
ATM integration	Not yet addressed
Training	FAB is considering this issue, but has not resolved its approach so far
Ancillary services	Not yet addressed
Interoperability of ATM systems	A task force is tasked with improving interoperabilty of SACTA and LISATM
Commonality of ATM systems	A task force is examining the case for a common FDP
Development of ATM systems	Not yet addressed
FAB Supervision Arrangements	In process of developing agreement based on co-operation agreement

Proposed changes: The revised letter of intent provides the following principle areas of co-operation: development of a feasibility study based on overall performance improvement of ANS and a common development of optimised design in line with SES; scenarios to provide medium term improvement in productivity and cost effectiveness based on current FIRs (including Canarias and Santa Maria); improvement of interoperability of the SACTA and LISATM systems, and development and procurement of an interoperable FDP system; air navigation equipment calibration (potentially a common company providing this service to both organisations); potential for NAV to join AENA in the SESAR JU contribution and participation; analysis of joint Research and Development requirements and opportunities in the medium term; and analysis of the common use of training processes and facilities.

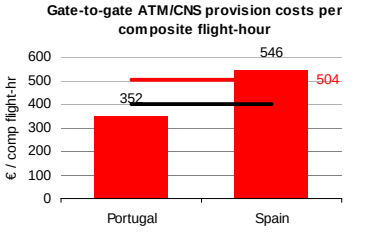
Arrangements



Arrangement	Justification
Co-operation with other FABs	Insufficient information received.
Decision making process for go/no go decision	Decision making based on option proposed by ANSPs and to be reviewed by the Member States
Range of options to be presented to States	One preferred option will be presented to Member States
Co-operation with military	Limited evidence
Social dialogue	Some involvement of ATC professional bodies and unions
Involvement of States	The evidence of involvement is minimal. There is a communication but no firm evidence that that there has been any actual involvement. A meeting is expected after October to review proposal.
Guidance from States to start and support FAB discussions	Initiative led by ANSPs and no evidence of clear guidance from States.
Involvement of users	Meetings with users on a regular basis

Key Performance Indicators

Economic



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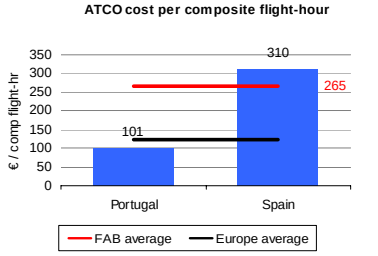

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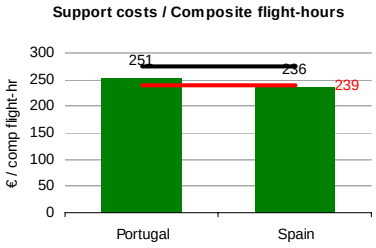
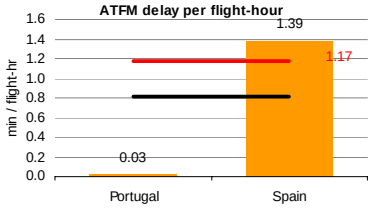


(2006 ACE Data)

Operational



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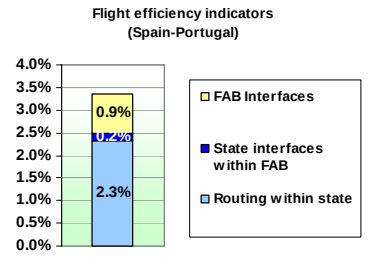
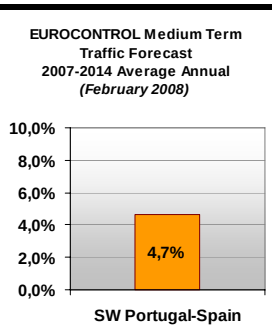


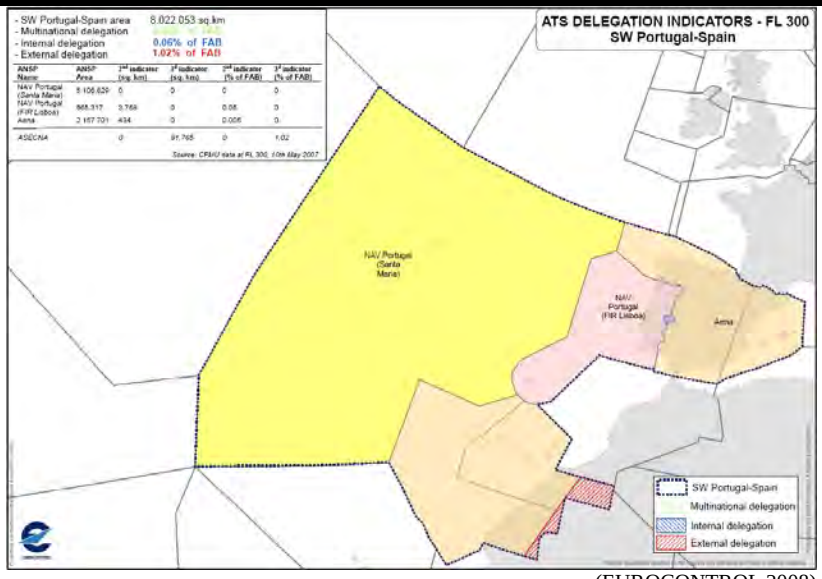
(PRU 2007)



(STATFOR Feb 2008)

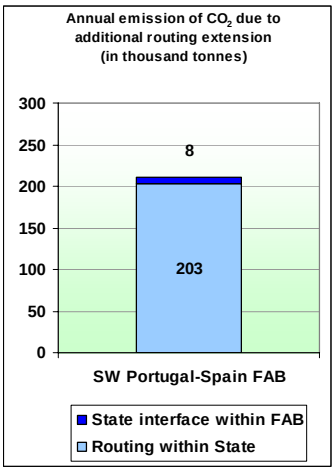
Key Performance Indicators

Operational



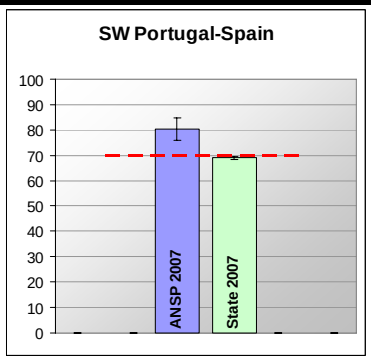
(EUROCONTROL 2008)

Environmental



(PRU 2007)

Safety



(EUROCONTROL 2008)

	ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
Due fully by:	**05-11-2007**	**01-01-2002**		**31-03-2008**	**13-07-2003**		**05-04-2004**		**11-04-2005**	
State	**Reg**	**ANSP**	**Reg**	**AST sent**	**ANSP**	**Reg**	**ANSP**	**Reg**	**ANSP**	**Reg**
Portugal	✓	✓	✓	✓	✓	Partial	✓	Partial	✓	Late
Spain	✓	✓	✓	✓	✓	✓	✓	✓	✓	Late

(LCIP 2008-2012)

Main quantified benefits from CBA

Main quantified benefits from CBA

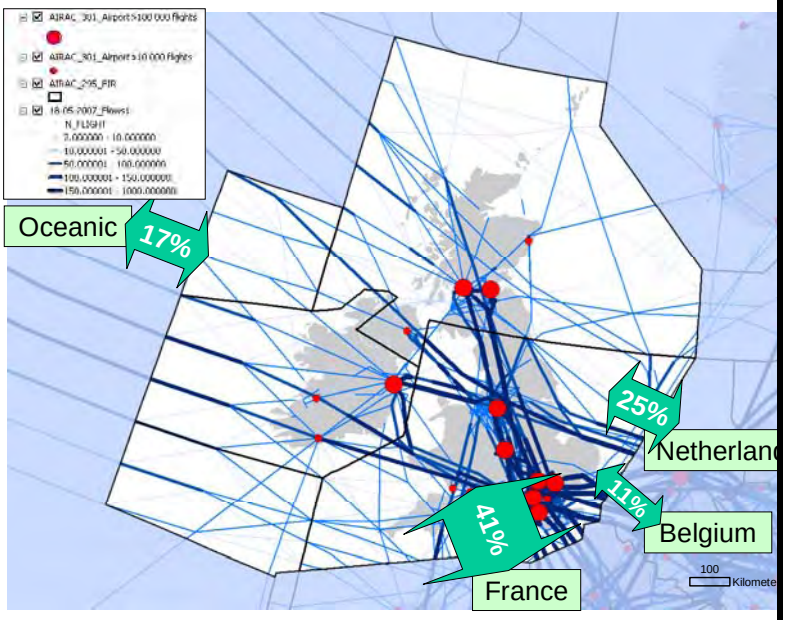
No CBA yet

UK-Ireland

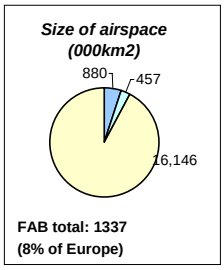
NATS (UK), IAA (Ireland)

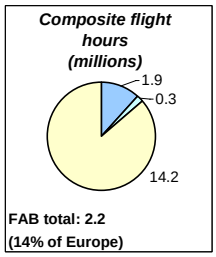
The UK-Ireland FAB initiative has been developed by its ANSPs – NATS and the Irish Aviation Authority (IAA), as well as its respective National Supervisory Authorities (NSA) the UK CAA – through the Directorate of Airspace Policy, Safety Regulation Group and Legal Directorate - and the Safety Regulation Division of IAA in Ireland. Representatives of both Departments of Transport of the Member States have played a key role in shaping the FAB initiative. It came into effect in July 2008.

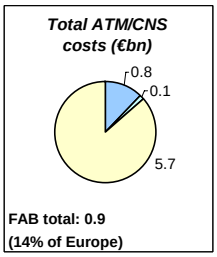
The pre- and post-North Atlantic traffic management sectors, and complex and busy terminal areas (London, Dublin) have very different airspace requirements. Longitudinal and latitudinal separation reductions in Shanwick airspace will lead to compressed traffic flows in domestic airspaces. In addition, increased traffic demand above the base is forecast, particularly on North Atlantic routes, due to the UK / USA Open Skies Agreement.

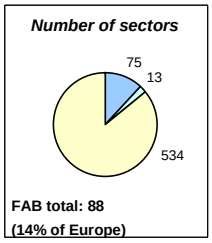


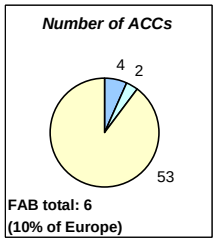
Size of FAB

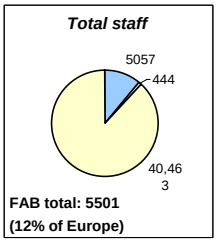


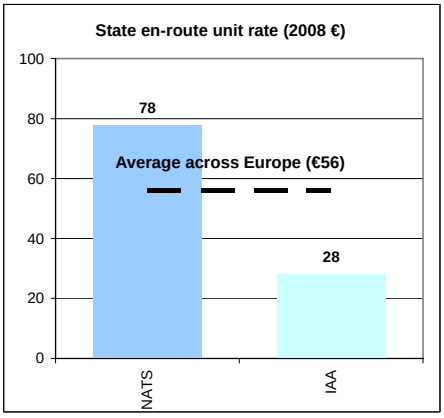






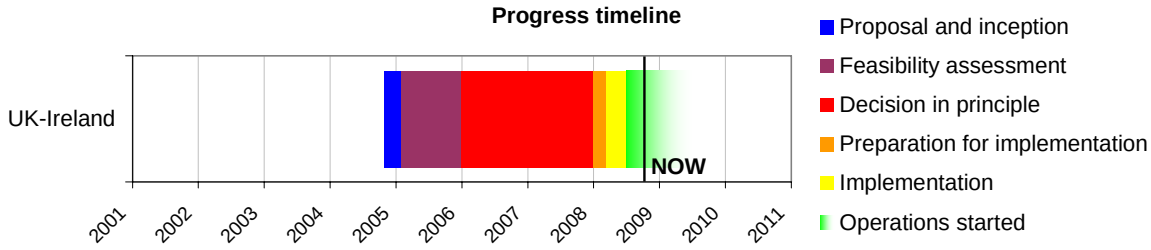






Data taken from ACE Report for 2006

Timescales

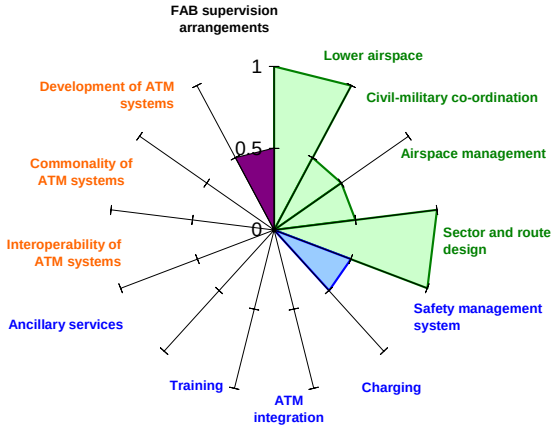


Proposal and Inception: February 2005;
Feasibility assessment: January 2006;
Decision in principle: October-December 2007;
Preparation for implementation: January-March 2008;
Implementation: March-July 2008;
Operations started: 14 July 2008.

Progress so far: An independent feasibility study was produced in early 2006, with a number of options. This was widely consulted on and presented to Member States. It was decided in late 2007 that business integration was not achievable in the short term, and the UK-Ireland FAB should be operationally driven using an approach of "Design & Build through Partnership with Airlines". A FAB Management Board has been established and tasked with identifying and defining business cases for changes to: airspace design and management; service provision; and safety.

Proposals for the FAB

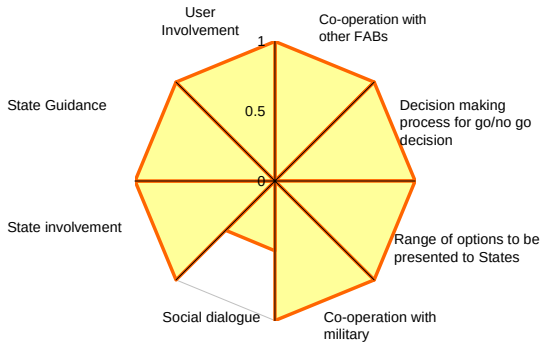
Characteristics



Characteristic	Justification
Lower airspace covered	Lower airspace will be covered by the proposed FAB.
Civil-Military coordination	The Management Board will include two co-opted Military representatives. It is a key objective to extend co-operation on FUA.
Airspace management	Through the service provision working group there are plans to develop a fully co-ordinated and consolidated network management function for the FAB.
Sector and route design	FAB management board have prioritised airspace design with a short term objective to integrate operation of Dublin, Belfast and Manchester and to create extra co-ordination points to allow for parallel routings
Safety Management System	The FAB establishes a safety management working group. It has plans for developing an integrated safety management system.
Charging	The initial focus of the FAB Management Board will exclude charging considerations.
ATM integration	FAB does not cover this characteristic
Training	FAB does not cover this characteristic
Ancillary services	FAB does not cover this characteristic
Interoperability of ATM systems	There are no plans for enhanced interoperability as part of the FAB.
Commonality of ATM systems	There are no plans for enhanced commonality as part of the FAB.
Development of ATM systems	Both ANSPs would continue to develop their own systems.
FAB Supervision Arrangements	A Supervisory Committee will be established to oversee the FAB management board operations. However, ultimate sanction will remain with the two NSAs

Proposed changes: The UK–Ireland FAB established a FAB Management Board, comprising an airline representative, NATS, and IAA, with working groups to support the output from the Board. Although established in July 2008, the FAB is still developing business cases for introducing specified changes to its operations. Seven key focus areas have been identified to develop for implementation over 2008-2010: safety - developing an integrated SMS for the FAB; performance management and reporting - annual FAB plan and integrated performance reporting and customer consultation process; environment - environmentally optimised routes; airspace design optimisation - integrated Dublin / Belfast / Manchester terminal airspaces and ACCs operation; oceanic transition - integration of oceanic / domestic traffic to accommodate increased demand; civil/military co-operation - developing support to allow optimisation of available routes and more flexible use of airspace; capacity/service delivery - developing a fully co-ordinated network management function; and interface with other FABs.

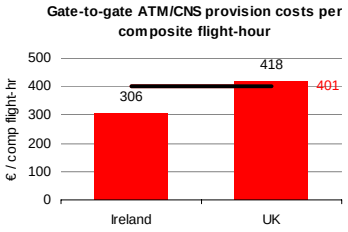
Arrangements



Arrangement	Justification
Co-operation with other FABs	NATS is a co-operative partner of FAB EC and is in discussions about a more formal membership of the FAB, and IAA is a member of the NEAP, which is progressing the NEFAB initiative
Decision making process for go/no go decision	Documents were presented to the Government , and a clear decision to proceed was given.
Range of options to be presented to States	Four options for airspace design presented in Feasibilty Study, then a further option for institutional structure was developed.
Co-operation with military	The Military have been involved with the development of the FAB during the feasibility study. Representatives of the Irish Air Corps and Royal Air Force have been appointed to the FAB management board and will be involved with creating initiative business cases.
Social dialogue	Effective process has been established for ensuring trade union views are heard. The FAB is in discussions with representatives of the trade unions to see how best they can be involved in the working groups of the FAB management board.
Involvement of States	Full involvement of Member States in examining options and the selection of the preferred option.
Guidance from States to start and support FAB discussions	Clear and appropriate political guidance given by both governments.
Involvement of users	Users to chair the service provision working group and are represented on the FAB management board

Key Performance indicators

Economic



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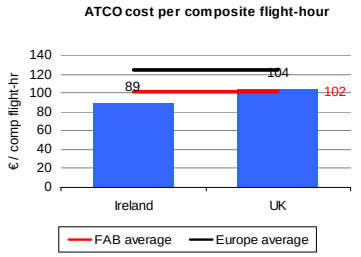

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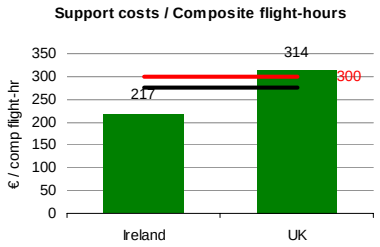

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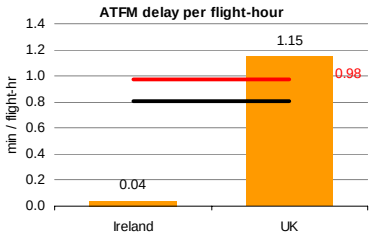
Operational



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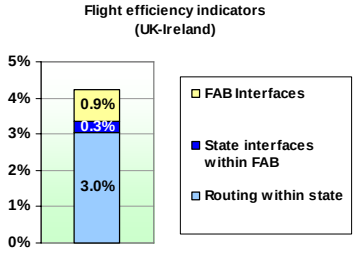

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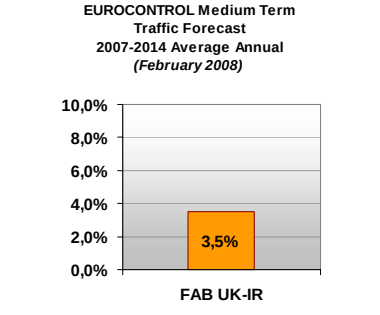

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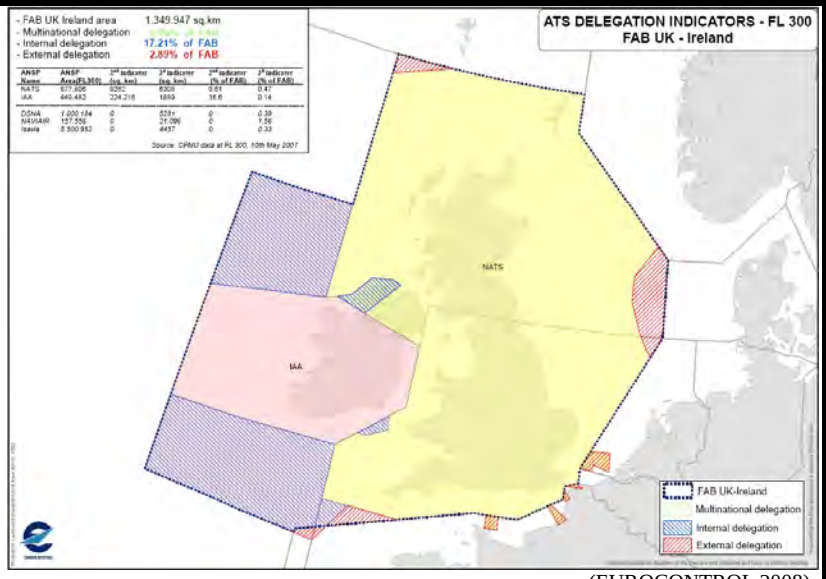
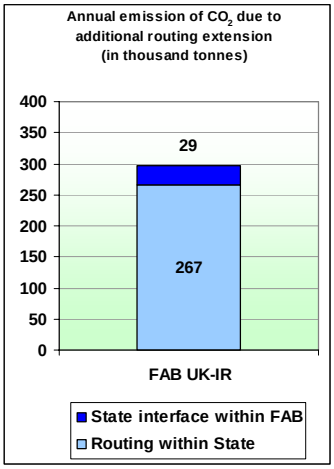
Key Performance indicators

Operational



(EUROCONTROL 2008)

Environmental



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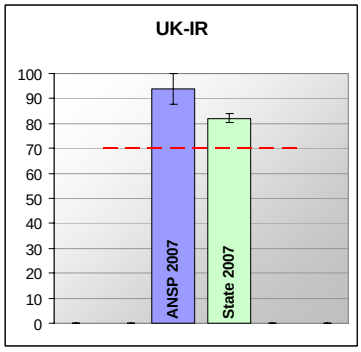
Safety



(EUROCONTROL 2008)

	ESARR1	ESARR2			ESARR3		ESARR4		ESARR5	
Due fully by:	**05-11-2007**	**01-01-2002**		**31-03-2008**	**13-07-2003**		**05-04-2004**		**11-04-2005**	
State	**Reg**	**ANSP**	**Reg**	**AST sent**	**ANSP**	**Reg**	**ANSP**	**Reg**	**ANSP**	**Reg**
Ireland	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UK	Partial	✓	✓	✓	✓	Partial	✓	under rev	✓	✓

(LCIP 2008-2012)

Main quantified benefits from CBA

Main quantified benefits from CBA

FAB	2013 benefits in M€	*% of net benefits derived from improved flight efficiency and delay*	2013 benefits as % of 2006 total economic costs	2018 benefits in M€	*% of net benefits derived from improved flight efficiency and delay*	2018 benefits as % of 2006 total economic costs
UK-Ireland FAB	€ 12 M	*100%*	**1%**	€ 40 M	*63%*	**4%**

The CBA shows very limited benefits so far. It is an indicative assessment of the gains that might be achieved through further co-operation between the UK and Ireland ANSPs. There is no direct relationship between any specific initiatives which might be brought forward by the UK-Ireland FAB Management Board and the benefits that are projected from the FAB.

ANNEX II: FRAMEWORK FOR EVALUATION OF FAB INITIATIVES

II.1 Introduction

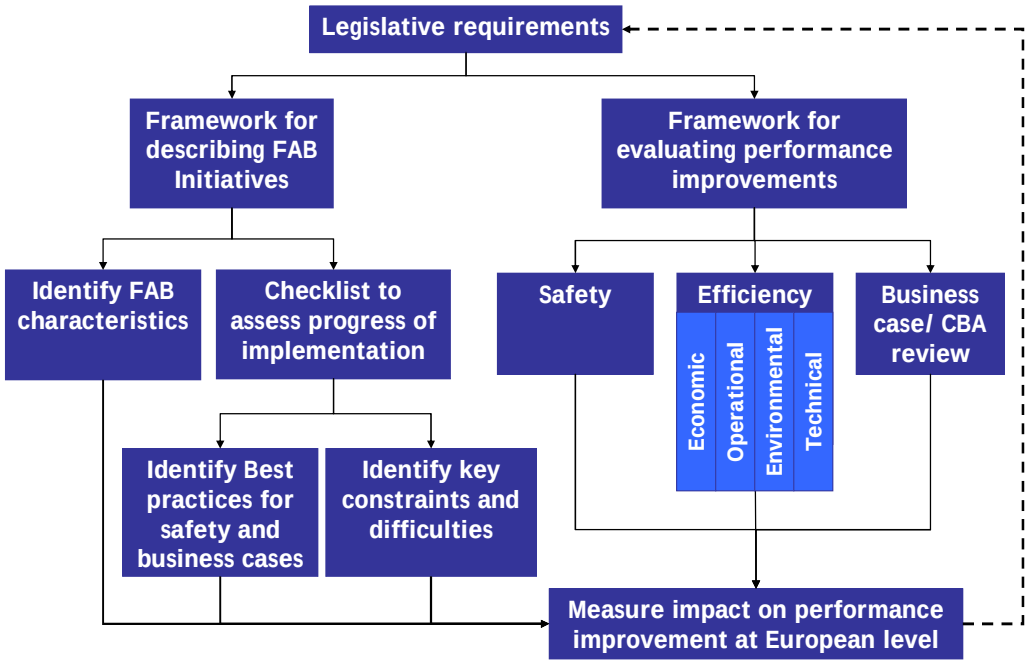
II.1 This Annex outlines the framework that has been developed for the assessment of the FAB initiatives.

II.2 The objective of the framework is to identify the nature of each FAB initiative, the progress towards implementation, and the benefits each FAB initiative generates or project that it will generate. The framework is designed to facilitate comparisons between FAB initiatives and therefore, although there are significant differences between the initiatives, the framework used is consistent for each.

II.3 Our approach to the assessment of the FAB initiatives is summarised in Figure II-1 below. The design of the frameworks takes into account the review of the relevant legislation and other publicly available documents, set out in Chapter 3. On the basis of this review, we developed a:

- **Descriptive framework:** a framework to structure our analysis of the scope of FAB initiatives and progress towards implementation. These frameworks provide a qualitative summary of the characteristics, organisation, progress to date and expected timescales to implementation of each FAB initiative considered. These frameworks will be applied on a common basis to all current FAB initiatives to allow comparisons to be made.
- **Performance framework:** a framework for evaluation of the performance improvement that FABs are expected to generate and, to the extent possible, to evaluate what performance improvements can be attributed to FABs, based on macro Key Performance Indicators and analysis/monitoring of Business cases and Cost Benefit Analysis.

Figure II-1: Overview of approach



II.4 Our approach to the assessment of the FAB initiatives is summarised in Figure II-1 below. The design of the frameworks takes into account the review of the relevant legislation and other publicly available documents, set out in Chapter 3.

II.5 The frameworks will be used to identify key issues and best practice, and to assess the impact of FABs on the performance of the European ATM system. They have also been a key input to the development of policy proposals, outlined in Chapter 7.

II.6 Later in this Annex, we detail our approach to using the FABs business cases and cost benefit analyses to assess their progress over time. This recognises the difficulty of separating the impact of a FAB from other business changes in some of the chosen Key Performance Indicators.

II.7 The FAB initiatives are at different stages of development and as a result it is not possible to assess all of the initiatives using all of the indicators that we have developed. There are a few indicators for which it is not possible to assess any of the FAB initiatives at this stage. However, they have been included in the framework as this is intended to provide a basis for continued long-run assessment of the FAB initiatives after the completion of this study.

II.8 These frameworks are described in greater detail in the rest of this chapter.

II.2 The descriptive framework

II.9 The descriptive framework consists of four elements for each FAB initiative:

- characteristics of the FAB;
- arrangements for the FAB;
- expected timescale for implementation of the FAB; and
- progress towards implementation of the FAB.

II.10 The purpose of the descriptive framework is to provide a high level factual summary of the nature of each FAB initiative and progress towards implementation, and to facilitate simple comparisons between FAB initiatives and over time. It is therefore important to use a consistent framework for assessment of each initiative.

A) Characteristics of the FAB

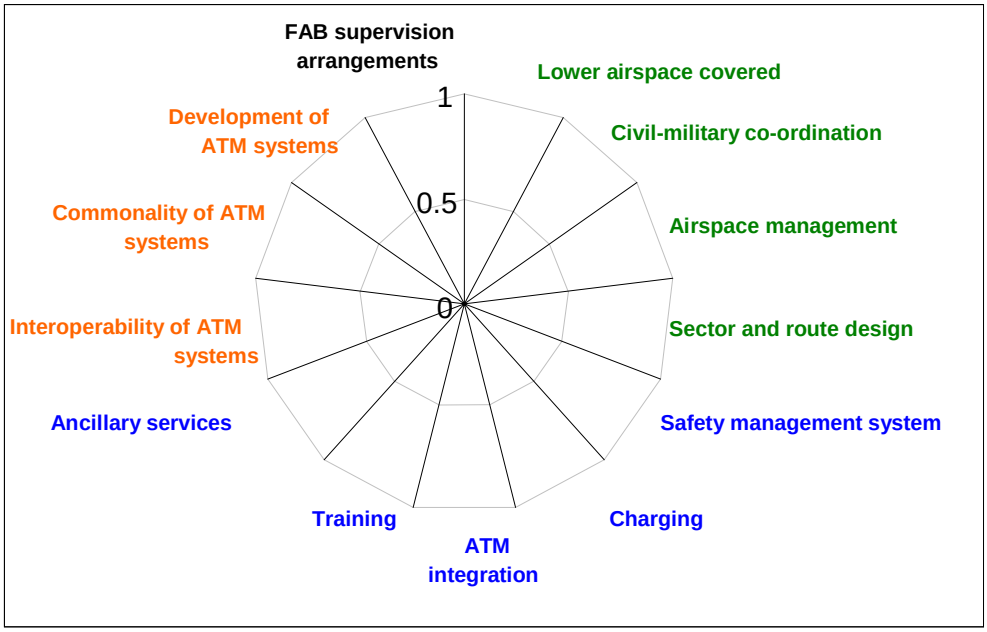
II.11 We have developed this framework since the Interim Report, to reflect comments received during consultation. The assessment is used to describe the changes that are under consideration as part of each FAB's feasibility study. As FABs move into their implementation phase, the framework can be used to asses what changes are being introduced by the FABs. The main characteristics we have assessed through this framework are whether the FAB explicitly:

- applies in lower airspace (it is a requirement that FABs must cover upper airspace);
- addresses the civil-military coordination;
- addresses the airspace management;
- changes the approach to sector and route design;
- foresees changes to the organisation of the safety management system;
- expects changes to the charging mechanism;

- plans greater integration of service provision;
- plans greater integration of staff training;
- applies to ANS ancillary services;
- addresses interoperability of technology;
- plans for commonality of ATM systems;
- plans for development of ATM systems; and
- changes the FAB supervision arrangements.

II.12 The characteristics framework identifies the extent to which the scope of the FAB includes each of these characteristics. An unpopulated example of this framework is shown in Figure II-2 below.

Figure II-2: Characteristics framework



II.13 It should be emphasised that this is **not** intended to imply that each FAB *should* cover each of these areas: the purpose is to show objectively what each FAB does cover, and facilitate simple comparisons between each FAB.

II.14 For each characteristic of the FAB, the criteria is as follows:

- 0 : scope of FAB does not cover this characteristic;
- 0.5 : scope of FAB covers this characteristic to some extent;
- 1: fully covered by scope of FAB.

II.15 A detailed definition of each characteristic and the categories used is provided in Figure II-3 below.

II.16 Since all FAB initiatives are still in a feasibility study phase (except for UK-IR), each characteristic has received a score corresponding to the scope of the feasibility study.

Figure II-3: FAB characteristics framework

	Category	Classification		
		0	0.5	1
Airspace	Lower airspace covered	FAB considering upper airspace only	FAB considering some lower airspace in its geographical scope	FAB considering lower airspace to same extent as upper airspace
	Civil-Military coordination	FAB considering keeping CIV-MIL coordination at national level	FAB considering partial harmonisation/coordination of approach to CIV-MIL coordination	FAB considering a single CIV-MIL coordination unit for the FAB (levels 1-3) as well as MIL-MIL coordination (level 3)
	Airspace management	FAB considering airspace management at national level	FAB considering a sub-regional NMU but with limited responsibilities (e.g. coordination only)	FAB considering a single ATFCM unit in charge of network and capacity management (including sector opening schemes and rostering)
	Sector and route design	FAB considering keeping sector or route design at national level	FAB considering greater coordination in sector and route design while keeping separate units	FAB considering a common unit responsible for sector and route design within the FAB
Service Provision	Safety Management System	FAB considering keeping SMS at national level	FAB considering harmonisation of SMS but keeping distinct SMSs	FAB considering a single SMS and a common Safety unit for the FAB
	Charging	FAB considering keeping national en-route unit rates	FAB considering distinct national en-route unit rates which include commonly agreed FAB related costs.	FAB considering a single en-route unit rate within FAB or multiple unit rates independent of national borders
	ATM integration	FAB not considering integration of ATM service provision	FAB considering some integration of ATM service provision (e.g. ASM, system supervision or maintenance, some jointly controlled airspace)	FAB considering complete integration of the provision of ATM within the FAB (one or multiple centres as part of one organisation)
	Training	FAB not considering integration of training for operational staff	FAB considering some integration of training with some sharing of resources, e.g. joint provision of certain elements of training	FAB considering a joint provision or procurement of training for operational staff, e.g. through joint training school
	Ancillary services	FAB not considering integration of MET and AIS	FAB considering some integration (procurement or provision) of MET or AIS services	FAB considering a joint procurement and provision of MET and AIS services
Systems	Interoperability of ATM systems	In the short term FAB not considering any change to the level of interoperability of ATM systems pending SESAR development	FAB considering a partial change to interoperability - some ATM systems interoperable between at least some centres	FAB already considering enhanced interoperability of ATM systems as if they were part of the same system
	Commonality of ATM systems	FAB considering keeping distinct national ATM systems	FAB considering introduction of some common ATM systems within the FAB (FDP, RDP…)	FAB considering introduction of common ATM systems within the FAB (covering all of FDP, RDP, HMI, controller assistance tools)
	Development of ATM systems	FAB considering keeping development of common ATM systems at national level	FAB considering some joint planning, procurement or maintenance of systems within the FAB	FAB considering joint planning, procurement and maintenance of systems within the FAB
Supervision	FAB Supervision arrangements	FAB considering the supervision of the FAB by each NSA or this issue is not yet covered during the pre-implementation phase	FAB establishes a NSA coordination committee, each NSA retains ultimate responsibility for decision making	FAB considering a common supervision of the FAB by a single NSA

B) Arrangements for the FAB

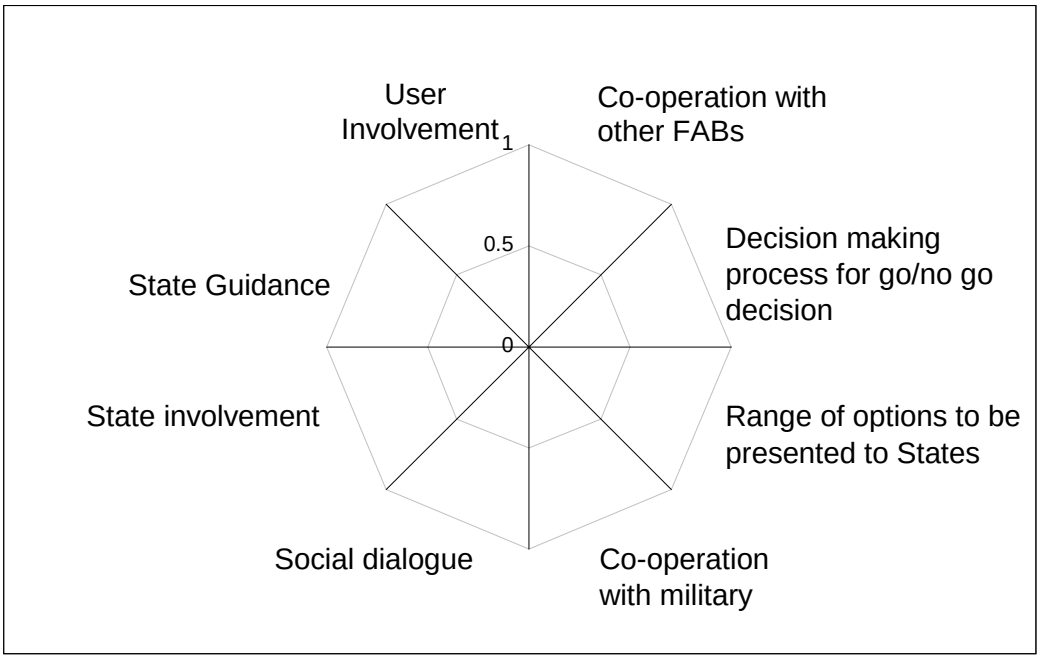
II.17 The arrangements framework identifies how the FAB project will operate during the development phase. These factors may be a key to the success of the project.

II.18 We have identified 8 key arrangements for a FAB. These are:

- the extent of co-operation with other FAB initiatives;
- the clarity of decision making arrangements for the go/ no go decision;
- whether a range of options are to be presented to the Member States by the management of the initiative;
- the extent of co-operation with the military;
- the extent of social dialogue;
- the extent of active involvement by the Member States in the initiative;
- the status of whether clear guidance is provided by the Member States and the States are committed to the initiative; and
- the extent of involvement of airspace users.

II.19 As far as possible, these elements have been designed to enable an objective assessment to be made. However, in practice there may be a trade-off between objectivity and the ability to measure the likely success of each FAB initiative. For example, a FAB could have extensive social dialogue, and therefore achieve the maximum score in this area, but the dialogue could be unproductive because the FAB proposal was unattractive to the workers for whatever reason and therefore this could still be a risk to implementation of the FAB. A blank version of this framework is shown in Figure II-4 below.

Figure II-4: FAB arrangements framework



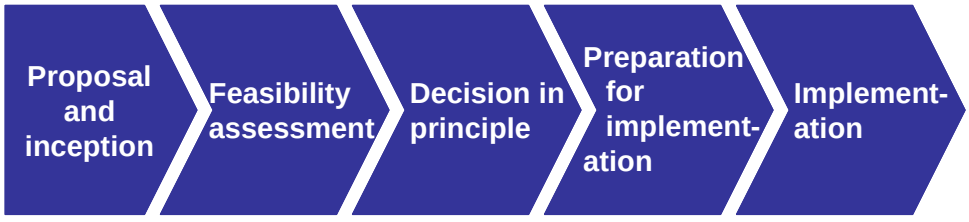
II.20 It is proposed to classify each FAB, for each element of the framework, using the same scale (0, 0.5 or 1) as for the characteristics framework. The definition of the categories is provided in Figure II-5 below.

Figure II-5: FAB definition framework

Category	Classification		
	0	0.5	1
Co-operation with other FABs	No co-operation with other FABs	Some co-operation with other FAB initiatives	Extensive co-operation with other FAB initiatives
Decision making process for go/no go decision	Governance and decision making arrangements unclear	Some aspects of governance and decision making arrangements unclear	Clear governance and decision making arrangements
Range of options to be presented to States	Only one option for the FAB to be presented by management of initiative to States	One basic concept for the FAB but with options for some elements to be presented by management of the initiative to the States	Range of options for the FAB to be presented by management of initiative to States
Co-operation with military	Minimal evidence of involvement of the military in the FAB initiative	At a minimum, regular consultation meetings with military representatives and/or involvement of the military in relevant Working Groups; or more extensive involvement but not sufficient to meet one or more of the criteria for a '1' classification.	Extensive involvement of the military in the FAB initiative throughout its development (inception, feasibility study and definition/development phase), for example representation in the Steering Group and in Working Groups, and evidence that the planning/design of the initiative has taken into account the military's objectives/concerns.
Social dialogue	Minimal evidence of involvement of workers in the FAB initiative	At a minimum, regular consultation with worker representatives or more extensive involvement but not sufficient to meet one or more of the criteria for a '1' classification	Extensive involvement of worker representatives where appropriate in the FAB intiative throughout its development (inception, feasibility study and definition/development phase), for example participation in relevant Working Groups; and evidence that the planning/design of the initiative has responded to workers' legitimate objectives/concerns.
Involvement of States	Minimal evidence of involvement of the states in the FAB initiative	At a minimum, regular consultation meetings with State representatives and/or involvement of State representatives in relevant Working Groups; or more extensive involvement but not sufficient to meet one or more of the criteria for a '1' classification.	Extensive involvement of the States in the FAB initiative throughout its development (inception, feasibility study and definition/development phase), for example representation in the Steering Group and in Working Groups, and evidence that the planning/design of the initiative has taken into account the State's objectives/concerns.
Guidance from States to start and support FAB discussions	Little or no evidence of clear guidance provided by the States and no evidence of political commitment to initiative	Either some guidance provided by the States but not sufficiently clear about objectives/targets to meet the criteria for a '1' classification; or clear guidance provided but without clear evidence of political commitment to the FAB initiative	Clear guidance provided by the States at the inception of the initaitive and, where appropriate, subsequently, setting out the objectives for the initiative and the targets to be met; and clear evidence of political commitment to the initiative.
Involvement of users	Minimal evidence of involvement of the users in the FAB initiative	At a minimum, regular consultation meetings with user representatives and/or involvement of user representatives in relevant Working Groups; or more extensive involvement but not sufficient to meet one or more of the criteria for a '1' classification.	Extensive involvement of users representatives in the FAB initiative throughout its development (inception, feasibility study and definition/development phase), for example representation in the Steering Group and in Working Groups; and evidence that the planning/design of the initiative has taken into account the users' objectives/concerns.

C) Timescale

II.21 On the basis of the requirements set out in the legislation and experience with the initial efforts to introduce FABs, we have identified the following generic five stages of actions which would logically need to be taken in order to introduce a FAB.



II.22 It should be emphasised that each FAB initiative is **different** and will approach the development and implementation of the project in different ways. It is necessary to use a consistent categorisation in order to allow comparison between FAB initiatives but this is not intended to imply that each FAB project should be organised into these five phases, nor the order that some tasks need to follow.

II.23 The timescale framework identifies when each of these five phases is expected to take place (or, for phases that are complete, when it did take place).

II.24 The implementation of a FAB starts with notification from the FAB to the Commission and under the framework is assessed by all of:

- Organisation/ systems change being established;
- Obtaining permission to operate (from NSA); and
- Operations started (leading to a change from the status quo).

II.25 Establishing only a subset of these would not warrant a full implementation of the FAB. For example, if the organisation had been established, permission to operate the FAB had been granted by the NSA but no value added changes to operations had yet been introduced, this would not represent a full implementation of the FAB.

II.26 Moreover, it is recognised that some FABs will introduce value added changes on a gradual basis and that each FAB's activities are likely to ramp up over time. On the basis of the current programmes we have reviewed more significant changes can be expected in the longer run as compared to the 'quick wins' targeted in the shorter term.

II.27 FABs should not be expected to be static organisations. Rather, they should be encouraged and expected to be dynamic. After the initial value added changes are introduced, there may be changes in relation to the:

- membership of the FAB;
- types of co-operation addressed;
- scale and speed of value added changes introduced.

D) Progress towards implementation

II.28 We have identified a series of actions for each part of each of these five phases, and based on bilateral consultation with each FAB initiative's project manager(s) and an independent review of documentation, have identified the current status of each task. The scale used for this is shown below.

Figure II-6: Categories for progress framework

Category	Explanation
Finished	Information available to us indicates that this task has been completed
Underway	Information available to us indicates that this task is underway
Not commenced	Information available to us indicates that this task is not underway
Unclear	Status of this task not clear from the information available to us

II.29 The tables below show the actions we have identified as part of each of these five phases. Key requirements of the SES legislation are highlighted in red.

Proposal and inception	
High level concept elaborated and proposed to potential partners by initiator (State or ANSP)	
Possibility of a FAB in outline form agreed by Member States or ANSPs	
If initiative led by ANSPs rather than government, governments of the Member States consulted	
Agreement to proceed with study development obtained in principle from all of the concerned parties (States, NSAs, ANSPs, military)	
Governance arrangements for the concept/feasibility stage established:	High level policy
	Steering group
	Project management structure
	Working groups
Arrangements (contract) between parties finalised	Project charter/terms of reference defined
	Obligations defined
	Financial arrangements defined
	Break clauses defined
	Assessment criteria defined
Project management structure for the pre-implementation activities created	
Project plan for the pre-implementation activities formulated	
External support procured (if required)	
Feasibility assessment	
Refinement of scope: options for geographical scope of the FAB defined and assessed	
Operational	Common operational concept defined
	Airspace design and sectorisation defined
	Risk and contingency plans defined
	Operational implementation plan defined
	Performance assessment defined
	Ancillary service provision defined
Technical	Current approach(es) and services documented
	Future technical solutions and services defined
	Technical roadmap defined
	Common maintenance concepts defined
	Technical implementation plan defined
Civil/military: options defined and assessed	
Institutional	Options for institutional characteristics defined and assessed
	State agreements (inc sovereignty and liability) defined
	Regulatory and governance arrangements (NSAs) defined
Human resources and change management	Social plan established
	Training plan developed
Financial	Cooperation models defined
	Charging arrangements defined
	Availability of external funds assessed
Safety	Preliminary safety case assessed
	Safety management plan developed
Ongoing consultation with stakeholders	ANSPs
	Governments
	NSAs
	Military
	Staff representatives
	Others, inc airspace users, EC

Decision in principle	
Shortlist of options based on feasibility outcomes identified	
Cost benefit analysis to establish that FAB would generate performance improvements sufficient to offset costs:	Capacity, delay and predictability assessed
	Flight efficiency assessed
	Capital costs assessed (inc. availability of external funding assessed)
	Project impact on operating costs, inc. productivity and support costs assessed
	Cost impact on users assessed
Risk assessment performed	
Environmental impact assessment performed	
Preferred option selected by managing body of initiative	
Preferred option selected by state	
Preparation for implementation	
Member States and European Commission consulted	
Users, staff, military and any other stakeholders consulted	
SESAR consulted about technological solution	
Revisions to preferred option on the basis of cost benefit analysis and/or consultation made	
Consistent procedures for civil/military coordination and use of airspace established	
Finalise arrangements for	Dispute resolution
	Modification of FAB
	Withdrawal from FAB
	Charging zone (if necessary)
	Service provision
	Supervision of FAB
	Transitional arrangements
Implementation plans defined	Operational
	Technical
	Civil/military coordination
	Institutional
	Human resources and change management
	Financial
	Safety
Outline safety case for FAB obtained	
Commission and Eurocontrol notified of common charging zone (if necessary)	
(Binding) agreement reached between Member States for establishment of FAB (inc.	
Commission notified of agreement	
Date at which the FAB would take effect published in OJEU	
Implementation	
Mechanism established for FAB supervision (NSA)	
Mechanism established for service provision	Management team recruited
	Operating procedures implemented and processes in accordance with common requirements, ESARRs and relevant implementing rules
	Infrastructure procurred or transferred
	New staff recruited (as needed)
	New and existing staff trained
	Existing staff migrated
	Technological solution implemented
	Final safety case for FAB obtained
Permission to operate obtained	Certification by NSA against common requirements
	Designation of service provider by the Member States within the FAB
Operations started	

II.30 In the ‘assessment towards implementation’ framework, the mandatory requirements of the SES are highlighted in red. You can see that based on a review of the experience to

date there are a large number of tasks required by FABs to reach the position where it is likely to be implemented.

II.31 In part, this is a result of the 'bottom-up' approach which left the implementation of the FABs to Member States to define and elaborate. However, Article 5(3) of the airspace Regulation provides for the development of principles for the creation and modification of FABs. So far, the European Commission has not yet given a mandate to EUROCONTROL to prepare those rules which provides a potential source of uncertainty over the approach to implementation.

II.32 This leaves a potential gap, for which some guidance material or check list to take a FAB from inception to implementation could be developed.

II.3 The performance framework

II.33 This section explains the metrics that are being used to assess the impact of the implementation of FABs on performance. The metrics cover each of the four areas within which FABs are expected to deliver improvements:

- Safety;
- Economic efficiency;
- Operational efficiency (such as capacity and delay), and airspace use and design (FUA and delegation of service provision) assessed on a qualitative basis; and
- Environmental performance: measuring sustainability of aviation.

II.34 In addition, we will measure on a qualitative basis the extent to which the FAB generates improvements in technical efficiency. This is not a performance objective in itself but is an overall requirement of the Single Sky Regulations and will also contribute to the achievement of safety, economic and operational objectives. This structure is summarised in Figure II-7.

II.35 We also set out our approach to assessing each FAB initiative's business case and supporting cost benefit analyses. A detailed description of the current CBAs is provided in chapter 6 of this report.

Figure II-7: Summary of areas and associated metrics

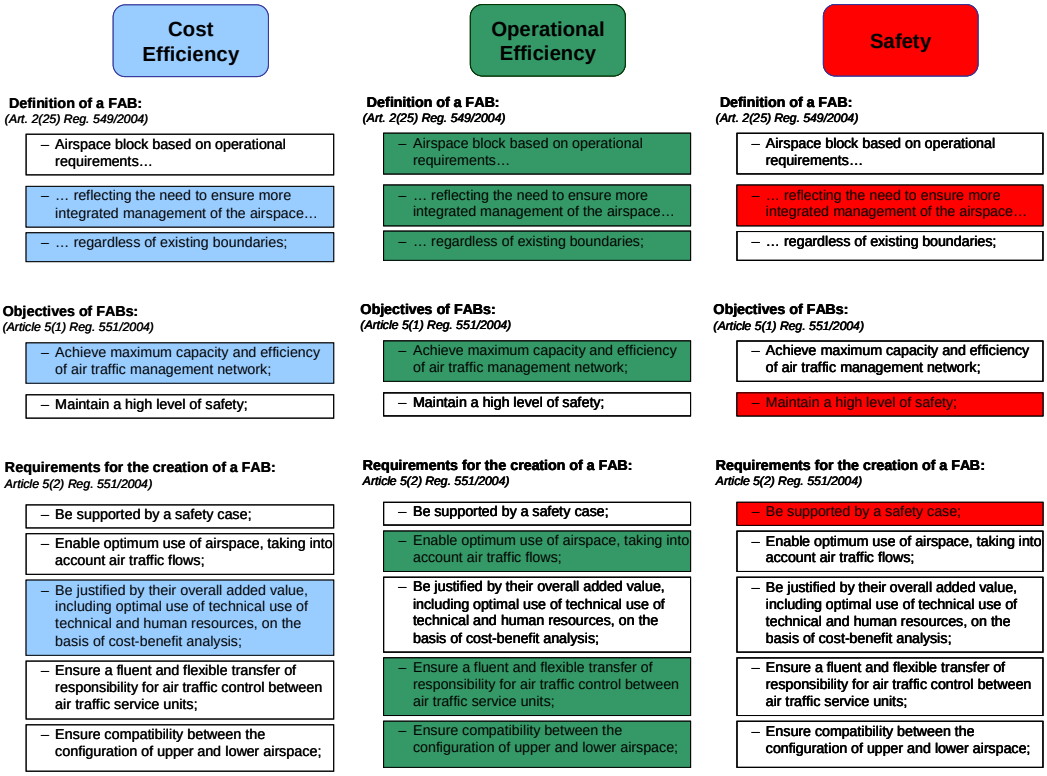
Safety	Efficiency			
	Economic	Operational	Environmental	Technical
Airspace events per flight Safety maturity Compliance with ESARRs	Financial cost-effectiveness KPIs	ATFM Delay Horizontal routing extension Delegation of ATS services provision Alignment of FAB with main traffic flows Airspace use and design: • Implementation of SES FUA • Airspace design and capacity planning process	Environmental impact due to horizontal routing extension	Interoperability of ATM systems Commonality of ATM systems

II.36 The key objective of the performance framework is to assess the extent to which each FAB initiative succeeds in meeting the objectives set out in the Regulations. Figure II-8

identifies the key requirements of the Regulations which relate to the performance of FAB initiatives.

II.37 In all cases maintaining or improving the level of safety is a prerequisite for any changes to be introduced by the FAB initiatives.

Figure II-8: Performance improvements



II.38 In addition the Commission's Communication of June 2008, underlined the importance of the Air Traffic Management industry in addressing the environmental performance of aviation and improving the sustainability of the industry through shorter routes and optimised flight profiles.

A) The key measurement and indicators

SAFETY

II.39 Maintaining the level of safety is a factor that all FABs consider a minimum requirement when assessing the impact of introducing any changes to their operations. However, most FABs have as an objective that safety should be improved.

II.40 Measurement of safety is currently difficult because consistent data is not available. The number of incidents reported represents the best "output" measure of safety but data is incomplete due to inadequate reporting and at present this data is available for some 30 Member States only and subject to strict confidentiality rules. Therefore, this metric is of limited use in the short term, because it would be incomplete and an increase in the number of reports could reflect better reporting rather than a deterioration in safety.

II.41 In addition to incident reports (which are by definition reactive and not yet entirely mature enough) as a metric, safety maturity scores could also be used as proactive indicators.

II.42 A supporting metric using the qualitative framework used in PRR 2007 to test compliance with ESARRs will be used. This replaces the PRC's assessment of cultural and legislative factors in safety reporting, used as the interim metric in the Interim Report, as this is now out of date. This supporting metric uses data provided by States/ANSPs in the latest version of their LCIP (LCIP 2008-1012).

II.43 The revised proposed metrics are summarised in Figure II-9 but might be updated on the basis of the outcome of the EUROCONTROL SAFREP Task Force[43] which aims at proposing quantitative safety metrics before the end of 2008 and test/validate them during 2009.

II.44 For the Draft final report, both the Airspace events per flight hour and safety maturity scores data has not been made available to the PRC to present on a FAB basis. Therefore, the PRC has only been able to present data for its supporting metric.

Figure II-9: Summary of KPIs – Safety

Metric	Detailed metric	Measured by	Source
Key Performance Indicators			
Airspace events per flight hour	Airspace events (A and B) per flight hour, as used in PRR 2007	FAB	EUROCONTROL SRU
Safety maturity	Average safety maturity score for ANSPs within FAB and for States	FAB	EUROCONTROL
Supporting metric			
Compliance with ESARRs	Test of how well the ANSP and regulator complies with ESARRs and whether the 2008 AST has been sent to SRU by end March 2008	ANSP	EUROCONTROL

COST-EFFECTIVENESS

II.45 The KPIs for cost-effectiveness are:

- Financial cost-effectiveness as measured in ACE;
- ATCO employment costs per output metric; and
- Support costs per output metric.

II.46 The financial cost-effectiveness KPI will be the main high level indicator. The rationale for the use of this is that it measures the total cost of the ATM/CNS system controlled by ANSPs. It does not take into account MET costs, nor costs incurred by the regulatory authorities. It is consistent with the principle of simple, output based metrics to treat total costs (rather than individual ANS cost elements) as the main KPI, because there may be a trade-off between different types of inputs.

II.47 The economic efficiency metrics measure gate-to-gate costs rather than en-route costs only, because:

43 SAFREP is a taskforce in charge of making proposals to the Provisional Council of EUROCONTROL in relation to Safety Data Reporting & Data Flow

- FABs might result in a shift of costs or resources between en-route and terminal control, or between lower and upper airspace, and therefore the costs of different parts of the system should not be viewed in isolation;
- Some FABs might cover certain terminal area services as well as en-route services (for example, in the London TMA);
- Cost allocation between terminal and en-route is not always consistent across ANSPs; and
- The boundary between en-route services and terminal services might change over time.

II.48 Measurement is per composite flight-hour, in common with performance metrics used for the Performance Review Report and the ACE Benchmarking Report. The alternative metric would be per kilometre; this has not been selected because:

- composite flight-hours capture gate-to-gate costs, which is what the users ultimately incur; and
- flight-hours better capture variations in work load (for example due to differences in speed).

II.49 A number of supporting metrics will also be used in order to explain the KPIs and to put these in context. In order to simplify the metrics, the supporting metrics relating to capital expenditure used in the Interim Report have been replaced with one combined figure. This will be based on the figures included in the ACE report, showing:

- projected capital expenditure;
- projected depreciation; and
- the capital/depreciation ratio.

II.50 The metrics are summarised in Figure II-10.

Figure II-10: Summary of KPIs – Cost efficiency

Metric	Detailed metric	Measured by	Source
Key Performance Indicators			
Financial cost-effectiveness KPI	Gate-to-gate ATM/CNS provision costs / Composite flight-hours	FAB	ACE data
ATCO costs	ATCO employment cost / Composite flight-hours	FAB	ACE data
Support costs	Support costs / Composite flight-hours	FAB	ACE data
Supporting metrics related to ATCO employment costs			
ATCO costs per head	Employment costs for ATCOs in OPS / Total ATCOs in OPS (to be measured with and without adjustment for PPPs)	FAB	ACE data, Eurostat (for PPPs)
ATCO average hours on duty	Total ATCO hours on duty / Total ATCOs in OPS	FAB	ACE data
ATCO productivity	Composite flight-hours / Total ATCO-hours on duty	FAB	ACE data
Supporting metrics related to support costs			
Support staff	Support staff / Composite flight-hours	FAB	ACE data
Total NBV fixed assets	Total NBV fixed assets in operation & under construction	FAB	ACE data
Capital costs	Projected capital expenditure and depreciation, and capital/depreciation ratio	FAB	ACE data

OPERATIONAL EFFICIENCY METRICS

II.51 The PRC's initial view of the KPIs for operational efficiency are:

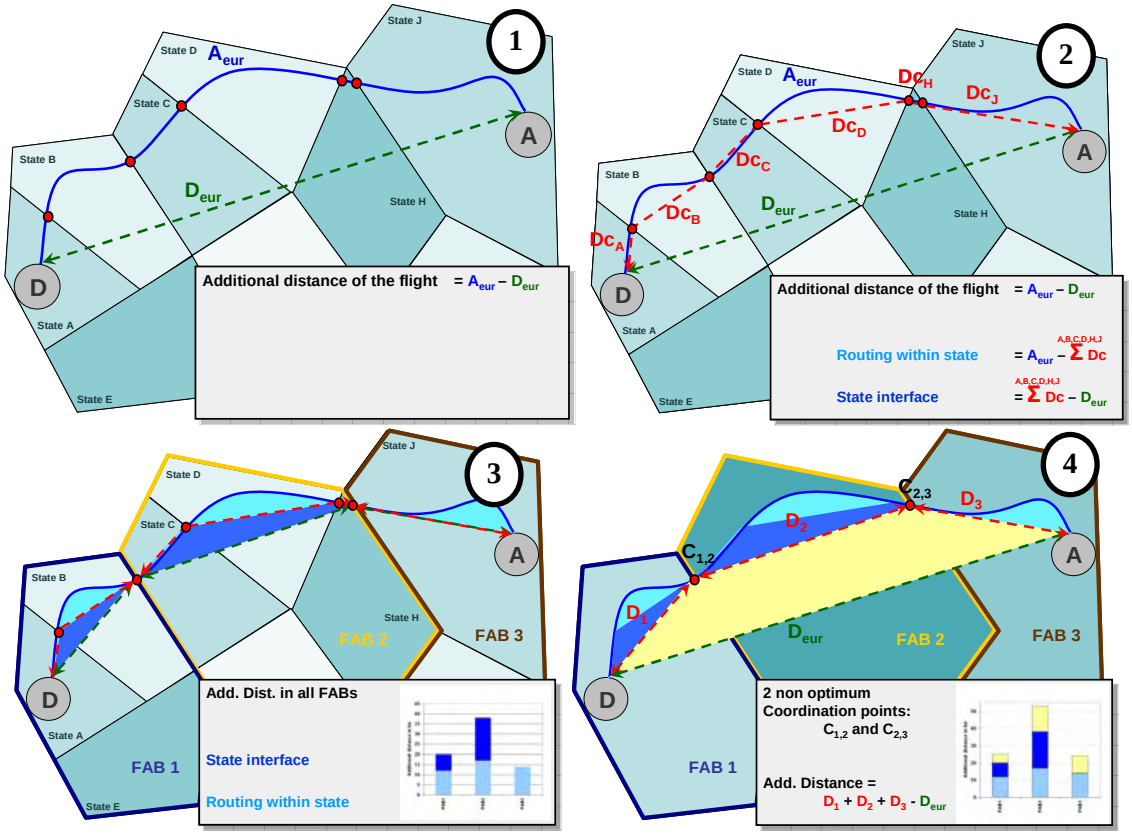
- ATFM en-route delay per flight-hour;
- Horizontal routing extension;

II.52 There is no metric for vertical flight extension because the PRC considers that this does not provide a useful means of distinguishing between different FAB initiatives.

II.53 ATFM delay is measured per flight-hour rather than per flight for consistency as flights are not additive (it leads to multiple counting) and because longer flights are, on average, at higher risk of delays. An alternative would be to measure ATFM delay per kilometre, which is likely to produce very similar results in practice.

II.54 The metric for horizontal routing extension will be based on a calculation of route extension (the actual flight length less the great circle distance). The distance within a 30NM radius around the airport is excluded from this to focus only on the en-route phase.

Figure II-11: PRC's approach to Routing extension allocation



II.55 As illustrated in Figure II-11 above, the route extension of a flight that is the difference between the actual distance flown and the great circle can be split into three very different additive components:

- **Routing within State:** This represents the difference between the actual distance of the flight in each State and the great circle between the entry and exit point in this State. It measures how far actual routing within States is far from the great circle in each State. This component (light blue in Figure II-11) is directly attributable to a particular State and thus easily attributable to a particular FAB.
- **Member States interfaces within FAB:** This represents the difference between the sum of the great circles in each Member State of the FAB (assuming that in each State, the flights are following a great circle) and the great circle between the entry and exit point in the FAB. It measures how far the interface points between different States in the same FAB are as compared to the great circle in the FAB. This component (dark blue in Figure II-11) is directly attributable to a particular FAB.
- **Interfaces between FAB**s: This represents the difference between the sum of the great circles in each FABs (assuming that in each FAB, the flights are following a great circle) and the great circle of the total flight (excepting 30NM around departure and arrival airports. It measures how far the interface points between different FABs are as compared to the great circle of the flight. This component (yellow in Figure II-11) is then attributed to each FAB following an additive methodology based on the additional distance due to these points (see annex VI of PRR 2007).

II.56 Figure II-12 summarises the metrics proposed for measurement of operational efficiency.

Figure II-12: Summary of KPIs – Operational efficiency

Metric	Detailed metric	Measured by	Source
Key Performance Indicators			
ATFM Delay	En-route ATFM delay per en-route flight-hour	FAB	eCODA and ACE data
Horizontal Routing extension	Routing extension kilometres / Route kilometres measured using great circle distance (excluding 30NM radius around airport)	FAB	Actual flight route data from radar (EUROCONTROL)
Supporting metrics			
Expected traffic growth	Cumulative traffic growth forecast (2007-2013), baseline scenario	FAB	STATFOR Medium Term Forecast 2007-2013
Delegation of ATS services provision		FAB	PRU
Short flights per FAB	% of flight segments with average distance less than 200 kilometres	FAB	PRU
Military Fleet	Airspace size per military fighters	FAB	DCMAC
Supporting qualitative metrics			
A description of the current En-route operational concept		State	Qualitative assessment
Application of Flexible use of airspace Regulation		FAB	Qualitative assessment
Airspace design and capacity planning process		FAB	Qualitative assessment

II.57 The expected traffic growth is calculated per FAB using EUROCONTROL's Medium Term Forecast document dated February 2008.

II.58 The delegation of ATS service provision indicators have been developed for the purpose of this study. Three metrics are used which show the share of airspace for which ATS is delegated. These metrics will be monitored over time to test whether FABs encourage a greater extent of ATS delegation (to support the objective of optimum airspace configuration).

II.59 These three metrics have been computed to measure:

- **External delegation:** both the delegation of ATS service provision within the FAB to a ANSP from **outside** the FAB and the delegation of ATS service provision from an ANSP of the FAB **outside** the airspace of the FAB;
- **Internal delegation:** delegation of ATS service provision **between** ANSPs of the same FAB; and
- **Multinational delegation:** delegation of ATS service provision to an **international ANSP**. Currently in Europe, this is the case of MUAC where upper airspace ATM service provision of parts of Netherlands, Germany, Luxembourg and Belgium is delegated to MUAC.

II.60 For the purpose of this study, the PRC has developed an indicator to show the share of "short" flight segments (less than 200km) which cross the borders of the FAB. All being equal, the shorter the flight segments in a given airspace, the larger the number of

interfaces for the flight. This indicator will be monitored over time to test how far FABs support the objective of optimum airspace reconfiguration.

II.61 Based on real traffic, the share of short flight segments which cross the borders of the FAB (both international take-off and landings and over-flights) have been computed in two different ways:

- For each individual ANSP of the FAB: Number of flight segments of less than 200km which cross the border of the airspace controlled by each ANSP divided by the number of flights within the FAB;
- For the whole FAB: Number of flight segments of less than 200km which cross the border of the airspace controlled by the FAB divided by the number of flights within the FAB.

II.62 The comparison of the two indicators shows how far the grouping of ANSPs within the FAB reduces the number of "short" flight segments, both in terms of over-flights and of take-off and landings. It shows how far those short flight segments are internalized through the creation of the FAB, thus limiting the number of interfaces.

II.63 The FAB indicator shows the share of short over-flights that still remain to be handled by the FAB. It also shows that the share of short segments due to international take-offs and landings which is important when main airports of the FAB are located close to the border of the FAB. It gives an indication where the creation of the FAB, as well as cooperation with neighbouring FABs could provide an opportunity to mitigate this.

II.64 Finally, based on the composition of military fleet that has been provided by EUROCONTROL DCMAC, the PRC has calculated the km² per fighter to try to estimate in which FAB civil/military cooperation will be particularly important.

II.65 Figure II-13 presents the framework used to describe the current En-route operational concept used by the various ANSPs of each FAB. It is based on the ICAO Global ATM Operational Concept (Doc 9854) from which the PRC has extracted some key components which have been considered as critical in the context of FABs:

Figure II-13: En-route Operational concept

	Categories
Civil-Military organisation	• Remote units and partially integrated systems • Remote units and fully integrated systems • Co-location of military and civil ATC in the same centre
Staff management in civil ANSPs	• Staff rostering: team or individual • Flexibility: high level description of overtime rules
Characteristics of pre-tactical ATFCM/ ASM integration	• Degree of ATFCM/ ASM integration • Degree of ATFCM centralisation at ANSP level
Civil ACC functions	• En-route • TMA (initial approach as defined by ICAO) • Approach (intermediate and final as defined by ICAO)

II.66 Airspace design and flexible use of airspace cannot be assessed quantitatively and therefore for these assessments we will use qualitative metrics. These are shown below in Figure II-14, Figure II-15 and Figure II-16.

II.67 The aim of the flexible use of airspace framework is to understand how each FAB is going to change the organisation and procedures/ standards for its airspace management

at a strategic, pre-tactical and tactical level (as defined in regulation (EC) 2150/2005). The qualitative assessment is described in Figure II-14.

Figure II-14: Qualitative assessment framework – FUA

Measures in place	Articles in Regulation 2150/2005	Covering	Changes introduced by the FAB	Key dates
Level 1: Strategic airspace management	4.1 h, i, j and k	• "develop cross border airspace use" • "Coordinate airspace management policy" • "Closer cooperation and coordination with neighbouring Member States" • "Establish one common set of standards for separation between civil and military flights."		
Level 2: Pre-tactical airspace management	5.2	• "Two or more Member States may establish a joint management cell."		
Level 3: Tactical airspace management	6.5	• "Where cross-border activities take place, Member States shall ensure that a common set of procedures to manage specific traffic situations and to enhance real time airspace management is agreed between civil air traffic services units and military air traffic services units and/or controlling military units which are concerned by those activities."		

II.68 Our qualitative frameworks for airspace design and capacity planning processes aim to augment the description in the characteristics framework by providing a description of the change in approach that will be introduced as a result of the FAB initiative. They are described in Figure II-15 and Figure II-16.

Figure II-15: Qualitative assessment framework – Airspace design process

Approach to airspace design	Description + Assessment	Dates for possible change
Harmonisation of airspace classification below FL 195 within the FAB	Yes/No	
Decision making process to optimise sector structure within the FAB	ANSP / State / FAB	
Decision making process to optimised route structure and military training areas within the FAB	ANSP / State / FAB	
Involvement of stakeholders in airspace design process within the FAB		

Figure II-16: Qualitative assessment framework – Capacity planning process

Capacity planning 1 year or more before operations	Description + Assessment	Dates for possible change
Measures for coordinating the capacity planning within the FAB	ANSP / State / FAB	
Involvement of stakeholders in capacity planning process within the FAB		

ENVIRONMENTAL PERFORMANCE

II.69 The Environmental impacts of the Air Traffic Management Industry are discussed in Chapter 7 of the Performance Review Commission's "Performance Review Report 2007". In that chapter a number of performance measures are used, including:

- Horizontal route extension (measured as an operational KPI in Figure II-11 above);
- Vertical flight efficiency – however the report acknowledges the relatively small potential for savings in this area.

II.70 In addition there are a number of indicators for use of aircraft at an airport (taxiing) and in holding patterns in the TMA. As this generally lies outside the remit of the FABs these have not been included.

II.71 Therefore, our main environmental KPI will be the estimated economic value of CO_2 emissions due to route extension as shown in Figure II-17.

Figure II-17: Summary of KPIs – environmental efficiency

Metric	Detailed metric	Measured by	Source
Key Performance Indicators			
Environmental impact	Estimated economic value of CO_2 emissions due to route extension	FAB	PRU

TECHNICAL EFFICIENCY

II.72 Technical efficiency will be assessed using a qualitative framework. The proposed technical efficiency framework is set out in Figure II-18:

Figure II-18: Summary of KPIs – technical efficiency

System	Impact of the FAB						System manufacturer(s)	Version	Key dates in integration system plan
	Specification	Procurement	Development	Training	Maintenance	Operations			
FDP									
RDP									
HMI interface									
Voice-Communication Switching. system									

II.4 Performance monitoring over time

DATA AVAILABLE TO UNDERTAKE PERFORMANCE MONITORING

II.73 The information available to undertake performance monitoring is as follows:

- the results of the Cost Benefit Analyses (CBAs) / Business Cases prepared for the FAB initiatives;
- the ACE Information Disclosure collected by the PRU on an annual basis, including the ANSPs/ Member State projections for key metrics over the next five years;
- ATFM delay and horizontal route extension data collected by EUROCONTROL; and

- the targets agreed by the governing body of the EUROCONTROL organisation for the rate of improvement in terms of cost efficiency, delay and flight efficiency.

II.74 Our suggested approach seeks to make use of existing data, where possible, and avoid additional data requests from industry stakeholders.

DIFFICULTIES WITH IDENTIFYING THE IMPACT OF FAB INITIATIVES ON PERFORMANCE METRICS

II.75 As recognised in Chapter 5, and discussed with stakeholders during the course of the study, it will be very difficult to identify the impact of each FAB initiative on the KPI identified in Chapter 5. Many of the KPIs will be influenced by all changes to the ANSPs' operations, including changes from existing EUROCONTROL programmes (DMEAN, Data Link, etc.) and SESAR.

II.76 However, at the same time it is within the industry's interest to be able to identify and monitor the achievement of expected improvements attributed to each FAB initiative.

OUR SUGGESTED APPROACH

II.77 Therefore, we suggest a two level approach to review and monitor the performance of the FAB initiatives over time:

- **CBA/ Business Case monitoring:** the expected changes resulting from the FAB initiative will be identified in the CBA/ Business Case used to justify its implementation. As the FAB is implemented, the detailed actions and impacts resulting from the FAB initiative will be monitored. Later in this chapter we outline the expected detail we would expect from the FAB initiative's CBA/ Business Case to enable this.
- **Key Performance Indicator monitoring:** using the metrics outlined in Chapter 5, we would aggregate data at a FAB and European level to monitor the changes year on year, and their expectations over the five years into the future. It is recognised that according to the timetable for FAB implementation outlined in Chapter 5, the reflection of FAB initiative impacts in the annual ACE Information Disclosure data may take some time to materialise.

CBA/ BUSINESS CASE MONITORING

II.78 Following a review of the approach to the production of the Cost Benefit Analyses we understand that the approach which has been used by the FAB initiatives has, in general, involved the grouping of cost and benefits in order to estimate a financial net impact. Typically cost benefit analyses are undertaken using a standard public sector approach following, to the degree appropriate, a methodology developed by EUROCONTROL. Several scenarios are considered and compared in terms of costs and benefits allocated to different stakeholder groups, classified into service providers, airspace users, the military and so on. Time is considered in terms of the relative evolution of the cost and benefit profiles, allowing cash flows to be estimated and net benefits for each scenario to be determined and compared using a net present value approach. This approach to CBA is a useful tool to support decision making as long as the scenarios assessed are realistic, especially the baseline scenario against which the others are compared. This baseline, usually termed the "*do nothing*" or "*do minimum*" option must reflect developments that would happen in the absence of the FAB, such as SESAR and existing EUROCONTROL programmes.

II.79 An issue with this CBA approach is that although costs and benefits might be identified and quantified on a bottom-up basis, they are generally presented in an aggregated form,

e.g. instead of a clear identification of specific airspace rerouting improvements, the CBA presents benefits that would result from an overall 10% general shortening of flight paths. The CBA, in this aggregated form, is a tool to inform a go/no go decision and cannot be easily used as a tool to assess progress against plans.

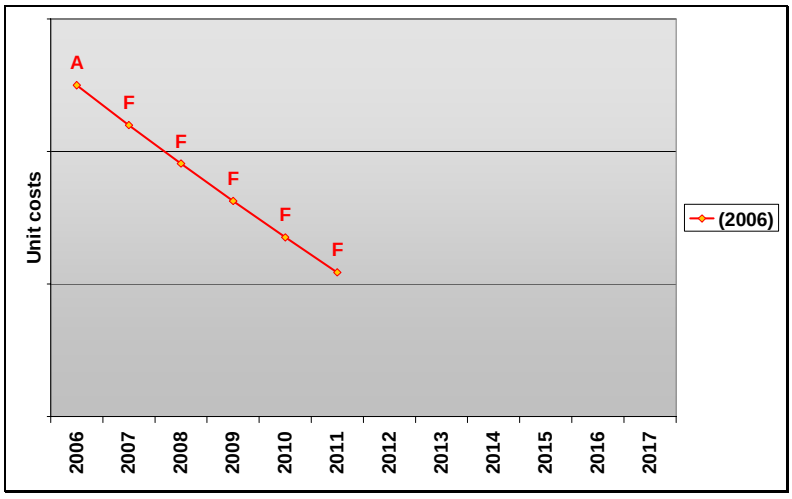
II.80 In order to use the CBA, which is mandatory for the FAB, to its best effect, it should be aiming to provide a Business Case that can be used to demonstrate the value added and source of comparison to what is actually achieved over time. To do this several criteria must be met:

- the scenarios considered must include a realistic baseline that includes all of the developments that would take place in the absence of the FAB. This enables the value of the FAB scenarios to be estimated compared to what would otherwise happen and a preferred scenario to be selected, which might actually be the "to not do FAB" option;
- the costs and benefits of the preferred scenario, assuming that the FAB goes ahead, need to be defined and analysed in detail and a detailed Business Case and Implementation Plan for the FAB formulated following the strategy of delivering. The level of detail needs to be such that the consequences and impacts of all actions are understood and can be scheduled optimally. The detailed benefits predicted in the Business Case should be used as targets for the FAB implementation, both in terms of the quantity and quality of the benefits to be delivered and the timeframe over which the benefits are to be realised;
- the business case should be viewed as a living document and used to assess progress both in terms of scheduling activities but also in determining the actual benefits delivered by those activities compared to those foreseen, for example does the FAB actually deliver a 10% reduction in the length of a particular route and what tangible benefits does this bring;
- the aggregated benefits delivered by the FAB should be compared to those predicted in the Business Case and the initial CBA over time in order to assess what the FAB really delivers relative to what was originally claimed.

PERFORMANCE MONITORING

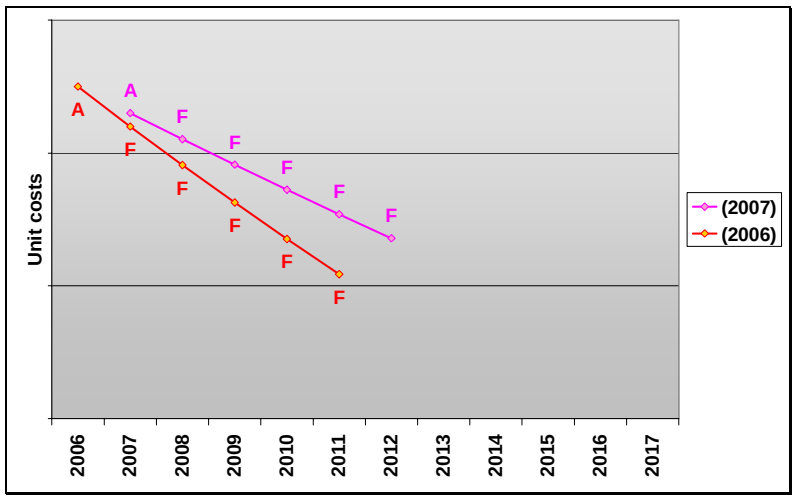
II.81 Using the ACE and EUROCONTROL data, we would be able to track the changes in the KPIs and also monitor the expected movements in the KPIs over the next five years (as provided in the information disclosure forecasts).

II.82 The graphics below illustrate how at a FAB level performance monitoring might take place in the area of cost-effectiveness using existing information disclosure. The illustration below, using an example of a cost efficiency measure, makes use of the latest ACE 2006 which provides forecast for the next five years (2007-2011). These will be combined (see earlier graphics) at both a FAB and European level:



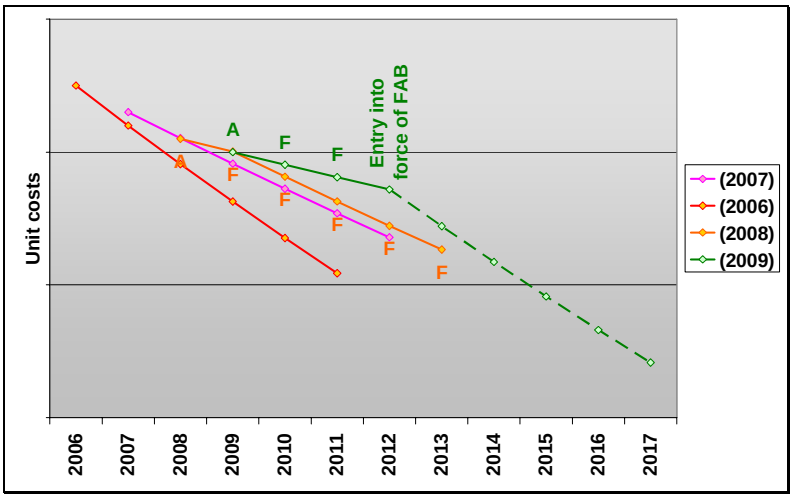
II.83 The ANSPs through the information disclosure process will provide the expected trends in cost-effectiveness measures without internalisation of FAB benefits before a FAB decision has been taken.

II.84 In the example below the actual data for 2007 is different to forecast in 2006 and the forecast for the next five years has changed.



II.85 When a definitive, positive decision has been taken to go ahead with FAB implementation we would expect the recognisable and quantifiable benefits to be revealed in the CBA/ Business Case for the specific FAB implementation. This in turn will be reflected in the actual and forecast of the ANSPs revealed in their ACE submissions.

II.86 For example, say that in 2009 a decision is taken to implement a FAB in 2012 with 3% improvement in cost-effectiveness after this date, we would then have a new profile of unit costs for the medium term (2012-2017) and possibly until 2020 (green line) which explicitly recognises and quantifies benefits from FABs. It would then be possible to compare with previous forecasts to identify the expected benefits from FABs.



II.87 ANSPs within a FAB should be accountable to explain and justify differences between actual and forecast for the current year and changes in their forecast for the forthcoming five years.

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ANNEX III: FAB-RELATED STAFF INITIATIVES

III.1 Introduction

III.1 This Annex presents FAB-related staff initiatives. The first one comes from the European Transport Worker's Federation (ETF), which gather 250,000 civil aviation workers. It is called the "ETF Co-op Model". It is not a FAB project, but it is the ETF's vision in the short and long term perspective, for sustainable FABs in Europe and beyond. The second one is called MOSAIC**.** This initiative is promoted by the Air Traffic Controllers European Unions Coordination (ATCEUC). It proposes an integration of the ANSPs involved in the FAB EC, plus Austria and Italy, organised as an international public service.

III.2 ETF Co-op Model

BACKGROUND

III.2 The European Transport Workers' Federation (ETF) and the Joint ATM working group (JATMWG) published its Co-operation model for FABs in Europe in February 2008. The proposal seeks to be constructive and available for use in Europe and beyond.

III.3 The description in the section comes from the publicity material used to describe the Co-operation model, it does not form the PRC's view on the initiative.

THE APPROACH

III.4 The aims of the "Co-op Model" are:

- to improve safety;
- to increase capacity, flight efficiency, cost effectiveness, reducing environmental impact;
- to address fragmentation through co-operation;
- to address and secure the social consequences of FAB implementation.

III.5 ETF promotes the use of the "Virtual Centre" concept and Co-operation model as the path to a successful FAB, leading to positive results for ANSPs, users and workers. The "Virtual Center" will enable an aircraft to be managed between two ACCs as by two sectors of the same ACC (radar handover, rerouting, direct routing…).

III.6 ETF does not support the top down approach for FABs implementation, neither a consolidation model for FABs, including a single ANSP for the FAB and ACC consolidation, as ETF believes it would create new institutional, legal and social difficulties.

III.7 It believes that the best way to reduce fragmentation is to improve cooperation and strengthen convergence. It has identified several kinds of co-operation and domains of co-operation (page 6), repeated in Figure III-1 below.

Figure III-1: ETF co-operation proposals

Kinds of co-operation	Domains of co-operation
Information sharing	Air traffic flow and Capacity Management
Establishment of co-operation framework defining the areas where joint project management can be foreseen	Convergence of technical system
Establishment of an institutional framework where common governance bodies take place	Airspace and sectors management
Pooling of resources	Harmonisation of procedures and rules
	Initial training
	Airports development
	Safety management
	Civil/ military
	Aeronautical and meteorological information
	Environmental issues

III.8 ETF promotes integration of all services of the safety chain (including CNS, AIS, MET and ATC for smaller airports) within a single organisation. It opposes unbundling.

III.9 ETF believes that the governance of the FAB should be based on consensus. ETF proposes to set up a FAB Co-operation Council. One of the roles of the Council would be to ensure *"permanent compulsory consultation process with the Trade Unions at all levels and negotiations where appropriate. At FAB level, a Social Forum should be set up"*.

III.10 ETF recognises the need for State and NSA commitment to the FABs. Only pro-active co-operation between States, ANSPs and employees will lead to long lasting solutions. ETF encourages States to commit towards implementation of FABs.

THE IMPACT

III.11 As they are proposals and suggestions, no direct impact of the co-operation model has been estimated. However, ETF strongly believes that changes involved in FABs are more likely to be accepted if employees are involved from the early stages of development.

III.12 ETF sees FABs as multinational projects which seek to secure and even create jobs in the ATM industry. In summary, the Co-operation model can lead to an increase in performance with positive social consequences.

III.3 MOSAIC

BACKGROUND

III.13 The MOSAIC initiative was launched by some unions and professional associations of Air Traffic Controllers and Air Traffic Safety Engineering Professionals (ATSEP) from Belgium, France, Germany, Italy, Luxembourg, The Netherlands, Switzerland and EUROCONTROL Maastricht. This initiative is promoted by the Air Traffic Controllers European Unions Coordination (ATCEUC).

III.14 This initiative is included here as it has the same geographic coverage as FAB EC, plus Italy and possibly Austria, and may have a significant impact on performance if it were to be implemented as intended. The following information comes from a presentation made by MOSAIC leaders. It does not imply any judgement or opinion on the part of the PRC.

III.15 Using the FAB concept, MOSAIC seeks to provide an alternative to any form of competition and privatisation of ANSPs. The MOSAIC initiative proposes an integrated inter-State public sector ANSP which would cover all elements of ATM (including approach and tower control). This initiative is based on "public sector" values as MOSAIC believes that ATM is not compatible with the commercial returns that a market shareholder would demand.

III.16 MOSAIC considers that the FAB EC initiative is too operationally oriented and lacks ambitious long term objectives/guidance from the Member States. In particular, they highlight that FAB EC only addresses a few key airspace cross-border constraints, but fails to address major airspace constraints such as, for instance, the 50 most constraining points identified in PRR 2006.

THE APPROACH

III.17 The proposed key changes that would result from the MOSAIC initiative are being worked on, but its main orientations would include:

- **Consolidating organisations/ANSPs** into one integrated civil-military service provider.
- **Seeking increased scale of operations and hence economies.** Sectors would be redesigned to improve efficiency. Technical infrastructure and support functions would be progressively streamlined. There would not be a reduction in the number of centres, although they agree that small en-route centres (below 10 sectors) can be sub-optimal. MOSAIC representatives consider that on current traffic trends, most existing centres in the MOSAIC area exceed or will soon reach the minimum efficient size.
- **Addressing delay plus safety issues.** The initiative acknowledges that delays have been reduced in recent years but are now starting to rise again. Analysis of ATM costs should not focus solely on route charges, but should also include delay related costs. They are concerned that capacity shortage will turn out to be the main issue for the airline industry in the future.
- **Addressing Civil/Military issues.** A key element is improved civil/military co-operation, based on the German model. It was acknowledged that French ATCOs had historically opposed this, but believed it was possible as part of MOSAIC. The initiative proposes more flexible use of airspace, allowing access both to civilian and military traffic. The impact of military activity on civilian traffic should be mitigated by avoiding as much as possible the use of Temporary Segregated Airspace, especially in the core area.
- **Introducing a single unit rate for the area**. Being a single service provision organisation, the financing would be fully integrated.
- **Proposing a common technical platform**. However the initiative accepts there would be a transition period of about 15 years.
- **Improved productivity**: the MOSAIC initiative would encourage increased ATCO productivity and target the upper range of productivity across ANSPs involved.
- **Pay/ working conditions**: MOSAIC would seek to equalise pay/working conditions at best levels for equivalent functions.

THE IMPACT OF MOSAIC

III.18 At this stage in its development, the MOSAIC initiative has not finalised the economic or operational impact assessments. However, MOSAIC considers that the increased costs of equalising pay and conditions at the best level for a given function would be offset by:

- The potential to achieve 25-40% performance improvement through enhancement in productivity, and hence reduced need for recruitment despite traffic growth, more flexibility in working conditions, common technical platforms, etc;
- A new multinational organisational scheme, building on experience in Maastricht UAC.

III.19 The MOSAIC initiative considers that increasing the overall performance of the system (increased productivity and flight efficiency) through such radical changes will be possible if and only if staff benefit from the evolution and are closely involved in it.

End of Report

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