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DRAFT IMPACT ASSESSESMENT

Accompanying the document

Legislative proposals

to update the regulations on Single European Sky - SES2+

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Executive Summary Sheet
Impact assessment on Legislative proposals to update the regulations on Single European Sky – SES2+
A. Need for action
Why? What is the problem being addressed? Maximum 11 lines
[*Problems' size, probability of occurrence and expected evolution. Main underlying drivers (refer to evaluation results if pertinent). Most affected stakeholders*] The Single European Sky (SES) initiative aims to improve the overall efficiency of European Air Traffic Management (ATM). The experience with SES I since 2004 and SES II since 2009 has shown that the principles and direction of the SES are valid and should continue, but high ATM costs and delays in SES implementation persist. The SES overall target or halving the costs for airspace users by 2020 will not be achieved. The two problem areas addressed in SES2+ are (1) insufficient efficiency of Air Navigation Service provision and (2) a fragmented ATM system. Regarding problem area (1) the drivers are gaps in Air Navigation Service Providers (ANSP's) performance and shortcomings in setting up and enforcing the performance scheme. Drivers of problem area (2) are the mediocre performance of Functional Airspace Blocs (FABs) and the fact that the Network Manager is not yet meeting expectations. The most affected stakeholders are the Member States and ANSPs, but it also affects airspace users (airlines, military and business and general aviation).
What is this initiative expected to achieve? Maximum 8 lines
[*Specify the main policy objectives providing a tentative quantitative indication of the targeted results*] The main objectives are (1) to improve performance of ANSP's in terms of efficiency and (2) to improve the utilisation of ATM capacity. The aim is to reduce ATM costs, improve flight efficiency and reduce delays as well as emissions. For that purpose at the operational level the initiative will clarify the institutional set-up of European ATM organisations and future-proof it to support the SESAR programme. Targets will be established within the framework of the performance for each reference period. Key indicators will be the cost charged to users, delays (min/flight), reductions in average flight extensions and improvements in runway throughput at capacity constrained airports.
What is the value added of action at the EU level? Maximum 7 lines
[*Transnational aspects. Limits of Member States action.*] Already in SES I (2004) it was agreed that actions by Member States alone cannot ensure the optimal building of capacity and safety, whilst assuring reductions in the cost levels of EU ATM services. By shifting airspace management from national level to the EU level, the SES aims to ensure consistent implementation of the existing EU air traffic *acquis* and to enable airspace users to benefit from a single consolidated legislative, operational and R&D framework and to face predictable business conditions throughout the EU. This should lead to creation of a Single European Sky and improve the competitiveness of European aviation sector.
B. Solutions
What legislative and non-legislative policy options have been considered? Is there a preferred choice or not? Why? Maximum 14 lines
A total of 20 policy options have been considered in 6 policy domains. (1) For the *ANSP support services* options of functional and structural separation were considered to allow for a market based and efficient support services. (2) To improve *ANSP's customer focus*, enhanced consultation of airspace users with or without ANSP governance were discussed. (3) For strengthening *the role of the National Supervisory Authorities* (NSAs), options of EU-level co-ordination and expert pooling with or without the full institutional separation of NSAs from the ANSP's have been analysed. (4) Two different governance models were considered to beef up the *performance scheme*. (5) For refocusing of *FABs on performance*, options proposed either prescriptive targets or 2 possible ways to change the setup of FABs. (6) Finally, for strengthening *the Network Manager*; 2 governance options plus one add-on option on operational scope of the Network Manager were discussed. The options in each policy domain were further combined into 3 policy scenarios: Baseline Scenario, Risk optimised scenario (moderate improvement, minimal risks) and Performance optimised scenario (significant improvement with higher risk of opposition). The performance optimised scenario 3 is considered to be the preferred policy choice as it heads towards a competitive and sustainable aviation system and economic growth in long run, even though during the restructuring phase it causes short term social costs.
Who supports which option? Maximum 7 lines
The performance optimised scenario 3 would result in highest benefits for airspace users, while having stronger social consequences for ANSPs. Therefore it is strongly supported by the airlines, but opposed by many ANSPs and Member States. Risk optimised scenario 2 would bring less befits to airspace users, but embedded also less impacts on employment and working conditions in ANSPS. Therefore it is more favoured by Member States and ANSPs. Trade unions and professional organisations who participated in the public consultation,

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opposed both policy scenarios.

C. Impacts of the preferred option
What are the benefits of the preferred option (if any, otherwise main ones)? Maximum 12 lines
Provide summary of expected economic, social and environment positive impacts indicating quantitative estimates to the extent possible and referring to main beneficiary groups (incl. consumers, businesses, etc.). Whenever the case: *- Include a justification for lack of quantification.* *- Explicitly state absence of significant direct benefits in economic, social or environmental area* According to the preferred policy scenario, the annual benefits for the airspace users are as follows: (a) more efficient ANSP services- around €780 million (b) improved flight efficiency (reductions in extra distance flown and hence also environmental benefits in terms of emissions) about €2 billion and (c) delay reductions about €150 million. In macroeconomic terms, the more favourable business conditions for airlines should create 13 000 new working places in the general economy, estimated induced GDP growth is €790 million by 2020 and €900 million by 2030. The main beneficiaries will be the airspace users and through them passenger, freight forwarders and new generation ANS providers.
What are the costs of the preferred option (if any, otherwise main ones)? Maximum 12 lines
Provide summary of expected economic, social and environment negative impacts providing quantitative estimates to the maximum extent possible and referring to main groups affected whenever relevant. *Please clarify magnitude and type of compliance costs and their sources.* *Whenever the case:* *- Include a justification for lack of quantification.* *- Explicitly state absence of significant direct negative impacts in economic, social or environmental area* The preferred scenario will add administration costs by €13.8-16.8 million per year and reduce employment in ANSP's by about 9400 over a decade. Apart from those mentioned above, there are no other significant economic, social or environmental impacts.
How will businesses, SMEs and micro-enterprises be affected? Maximum 8 lines
Clarify and justify regime for micros and for SMEs [total exemption / partial exempt. / Lighter / Others / Full application] - Describe any specific impact for these types of businesses (or state that there are none expected) All national ANSPs are currently large enterprises, thus this initiative will have no direct impacts on SME. Any indirect impacts are also limited, given that the air traffic charging system exempts small aircraft. The improvements in cost-efficiency would have a small positive impact on those small aircraft operators that are covered by the charging rules. The initiative may create new SMEs in the domain of ANSP, given that opening the market for support services could provide new business opportunities (in areas such as aeronautical information, meteorology or communications services) for SME's with innovation related competitive advantage. Some SME's could also participate in groupings of companies competing for tenders from the Network Manager.
Will there be significant impacts on national budgets and administrations? Maximum 4 lines
The only cost for national budgets is the need for an estimated 80 new oversight officials at a cost of around 13 million per year. However, the Member States have an obligation to ensure adequate resourcing of NSAs already under current legislation.
Will there be other significant impacts? Max 6 lines
No (why) / Yes [identify impact and provide reference to section in IA report] *Reference impacts are those outlined in IA guidelines and not already covered above. For instance, fundamental rights, competitiveness, regional, simplification, international (third countries, trade and investment flows), competition etc.* The initiative will have positive impacts for the competitiveness of the European ATM system, which would benefit all airlines (EU and non-EU) flying in the EU airspace. These impacts are discussed in sections 6.2.4 and 6.2.5 of the impact assessment report.
D. Follow up
When will the policy be reviewed? Maximum 4 lines
The Commission will review the application and effectiveness of SES rules at the end of each performance scheme reference period. Next report is due for 2015 and the one after that 2020. The Commission will evaluate whether the objectives of the initiative were achieved, and if not, consider which additional steps need to be taken in order to complete the task.

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1 INTRODUCTION

1.1 POLICY CONTEXT

The Single European Sky (SES) initiative aims to improve the overall efficiency of the way in which European airspace is organised and managed through the reform of the industry providing air navigation services (ANS). Its development has involved two comprehensive legislative packages – SES I and SES II composed of four regulations[1] – and over 20 Commission implementing rules and decisions[2]. The framework of the four SES regulations is intertwined with the development of the European Aviation Safety legislation[3], the latter comprising a number of tasks entrusted to the European Aviation Safety Agency (EASA). And the launch of a comprehensive project to modernise equipment and systems for air navigation services under the SESAR title[4]. Existing rules touch upon five interrelated pillars addressing performance, safety, technology, human factors and airports.

The experience gained with SES I since 2004 and SES II since 2009 has shown that the principles and direction of the SES are valid and warrant a continuation of their implementation.

In SES II, the Member States had already agreed that performance of ATM should be improved by setting out a performance scheme, with binding performance targets for more efficient air navigation services, and creating a centralised Network Manager, that provides certain services, which can be better performed at network- rather than national level. Furthermore the States agreed to accelerate the development of Functional Airspace Blocks that seek benefits from co-operation between service providers. However the initiative is experiencing significant delays in its implementation, notably in the achievement of the performance goals and the deployment of its basic elements (such as functional airspace blocks (FABs) or National Supervisory Authorities (NSAs)).

As regards timing of the initiative, SES is unusual in the sense that a constant monitoring and evaluation system is in place in the form of the performance scheme, which allows the Commission to make corrections to policies very early. Currently the evidence coming from the Performance Review Body's daily work and this impact assessment shows that although the direction initiated in 2009 is correct, the speed is lacking. Therefore we should accelerate the development of the SES initiative, continuing to strive for an integrated European air traffic management system.

In 2009, when adopting the SES II package, the legislator decided that SES II would be done in two stages and invited the Commission to come back to do an alignment of SES and EASA regulations after the initial set of EASA implementing measures and audit experiences concerning ANS would be in place[5]. A recast of the legislative package was therefore already

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1 The Framework Regulation (EC No 549/2004) - laying down the framework for the creation of the Single European Sky; The Service Provision Regulation (EC No 550/2004) - on the provision of air navigation services in the Single European Sky; The Airspace Regulation (EC No 551/2004) - on the organisation and use of airspace in the Single European Sky; The Interoperability Regulation (EC No 552/2004) - on the interoperability of the European Air Traffic Management network

2 An overview of SES legislation can be found in Annex III

3 Regulation (EC) 216/2008, as amended by Regulation (EC) 1108/2009

4 Council Regulation (EC) 219/2007; SESAR (the Single European Sky ATM Research Programme) is a technical pillar of SES - an ATM improvement programme involving all aviation

5 Regulation (EC) 216/2008, (as amended by Regulation (EC) 1108/2009) Art 65a

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foreseen primarily aiming at simplifying and clarifying the border line between EASA and SES legal frameworks (see box 1-1).

The process of recast also gives the opportunity to assess the effectiveness of the existing legal provisions in the light of the experience gained in implementing the current SES II rules since 2009 and the evident lack of timely implementation of this initiative. This process of a periodic revision of the SES legal framework, known under the abbreviation of SES 2+ is intended to accelerate the implementation of the reform of air navigation services without departing from its original objectives and principles and forms a part of the Single Market Act II[6] initiative and aims hence also to improve the competitiveness and growth of the EU economy in general.

The purpose of this impact assessment (IA) is to support the development of a SES 2+ package which should improve SES II implementation by focusing on certain institutional matters as well as on further performance improvement of service provision.

In addition, the SES 2+ package would simplify the legislation by eliminating certain overlaps in the existing framework. Also the stakeholders have raised the concern of several overlapping areas and gaps existing in SES framework and expect that the roles of the various organisations involved will be clarified. Since this alignment is a pure recast measure already required by the legislation, it is not included in the scope of this IA. It also has no budgetary implications.

Box 1-1: Rationale for recasting the SES legislation

Firstly, when SES II was approved and certain competencies were transferred to EASA in order to establish its role as the single EU aviation safety body, the European Parliament and the Council preferred to leave the corresponding and already existing competencies in the SES regulations intact. Instead it addressed this overlap of Regulations by inserting a new Article 65a into European Aviation Safety Legislation (Regulation 216/2008). This article requires the Commission to propose amendments to the SES regulations to take into account the requirements of Regulation 216/2008.

Secondly there is a more general mismatch between the approach used for all other sectors of aviation (airworthiness, crew licensing, air operations etc.) in the EASA framework and air traffic management (ATM). Whilst generally the approach is that all technical regulations are concentrated under the EASA scope to serve the objectives of Article 2 of 216/2008 and economic regulation is performed by the Commission, in ATM (i.e. SES) the picture is more mixed, with technical regulations stemming from various sources. It would be beneficial to ensure a harmonised approach to this important regulatory area, so that all consultations are performed with the same thoroughness, all rules fit in the same structure and serve same objectives, making life for those responsible for applying the rules easier and finally to ensure that the impending wave of technological innovations stemming from the SESAR initiative can be carried out in a co-ordinated manner both in airborne and ground equipage and procedures.

This impact assessment (IA) has been prepared by DG MOVE to support legislative proposals on improving efficiency, safety and competitiveness of the Single European Sky. The package proposes revising the four SES Regulations (549-552/2004 as amended by Regulation 1070/2009) and the EASA Basic Regulation (Regulation 216/2008, as amended by Regulation 1108/2009)[7]. This initiative concerns agenda planning number 2014/MOVE/001. The impact assessment roadmap has been published at the website of the Commission[8].

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6 COM(2012) 573 final

7 As mentioned above, the amendments to the EASA Basic Regulation will be of a technical nature and therefore will not be analysed in the IA context

8 http://ec.europa.eu/governance/impact/planned_ia/roadmaps_2013_en.htm#MOVE

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1.2 ORGANISATION AND TIMING

An Impact Assessment Steering Group (IASG) was created in July 2012. The following DGs were invited to participate: SG, BUDG, COMP, ECFIN, TAXUD, ENTR, MARKT, EMPL, HOME, ENV, CLIMA and SJ. The IASG met 4 times, in addition there have been exchanges of documents and comments by e-mail.[9] The last IASG meeting was held on 5 March 2013.

1.3 CONSULTATION AND EXPERTISE

The Commission services have discussed the developments of the SES with sector representatives on an on-going basis since 2000. In spring 2008 an IA was conducted also to support the SES II proposal. Furthermore a report on SES implementation was presented to the European Parliament and Council on 14 November 2011[10].

In order to support the Commission in the IA process for SES 2+, an external consultant was tasked to prepare an IA support study[11] and to analyse the results of the stakeholder consultation.

The public consultation in the form of internet survey was open between 21 September and 13 December 2012. A total of 83 responses were received. Most of them were from representative bodies at European level representing air navigation service providers (ANSPs), airlines, airport operators, manufacturing industry, other civil airspace users, representative and/or professional associations, trade unions and miscellaneous respondents.

The consultation was followed by interviews with major stakeholders[12] and a stakeholder workshop was organised together with the European Economic and Social Committee on 21 January 2013. In addition the Commission services have discussed the initiative with the Single Sky Committee (the relevant comitology[13] committee), the Civil Aviation Sectoral Social Dialogue Committee and the consultative expert group on the social dimension of the single European sky. Many bilateral meetings with air navigation service providers (ANSPs), airlines and other industry representatives at various levels have also been held.

All interested parties and Member States have been consulted in due time and discussions have covered all the key elements of the initiative. Therefore the Commission's minimum consultation standards have been met.

Summary of main conclusions

In general stakeholders agreed with the initial set of problems as proposed by the Commission - the performance of ANS continues to be an issue and the SES progress so far is perceived as being marginal. However, the views were more dispersed as regards the objectives of the initiative:

- The airlines felt typically that organisation of the services in Functional Airspace Blocks (FABs), the functioning of the performance scheme and the overall management of technical interoperability regulations were lacking.

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9 24 July 2012, 25 January 2013, 22 February 2013, 5 March 2013

10 Com(2011)731 final

11 [reference will be added after publication]

12 For the list of stakeholders consulted – see Annex IV

13 In the context of this document 'comitology' refers to procedures applied within the framework of delegated and implementing acts

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- The air navigation service providers (ANSPs) generally felt that the overall SES initiative was in need of attention and they in particular wished to target the performance scheme, interoperability and FABs.
- States (ministries and national supervisory authorities) saw also need for attention in the performance scheme, but focused especially on the FAB-related issues of overall airspace design and organisation.
- Rather on a different note the representative/professional organisations did not consider the efficiency of service provision being an issue and saw most need for attention in the human factor, as well as safety and interoperability regulations. They are clearly concerned of the possibility of job losses and deteriorating working conditions.

Overall, stakeholders were of the opinion that instead of producing new rules, the Commission needs to focus on improving the implementation and enforcement of existing regulations and reduce duplications and inconsistencies. However, there was considerable variation between the different interest groups as to the priorities and exact solutions which should be employed:

- Airlines wished to focus mostly on the performance scheme, while the ANSPs and states also raised the need to improve airspace design and organisation, airports and the interoperability framework.
- For introducing the market principles to the service provision, the trade unions and professional associations were against, while airlines strongly supported the idea and majority of the service providers themselves recognised the potential of more competitive services.

Annex IV provides more information on stakeholder consultation.

1.4 CONSULTATION OF THE IMPACT ASSESSMENT BOARD (IAB)

This IA was reviewed by the IA Board on 10 April 2013. Based on the Board's recommendations, the report has been revised according to the following lines:

- The problem definition has been strengthened to better integrate the evaluation results of SES and to identify more clearly the shortcomings in the current situation.
- The general objective has been defined and operationalized more precisely. The importance and mechanism of fragmentation as a driver has been strengthened and the problems with current overall targets explained in more detail.
- The choice and differences between the policy scenarios have been explained better, and positions of stakeholders highlighted throughout the text. Links to the 2011 communication have also been strengthened and trade-offs between various policy options explained better.
- The costs and benefits of the various options have been explained in more detail by showing the calculations and logic behind the assessments and by improving the evidence based in so far as it is possible. However, whilst there is abundant data thanks to the work of the Performance Review Body, it has not been possible to indicate published sources for all of it, as much of the work performed for the Commission is based on ad-hoc studies and calculations. Where uncertainties exist, this has been explained as well as including the sources, assumptions, reasoning and relevance of all the estimates.

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- Finally a general checking and correcting of the text has been performed to ensure al datasets are consistent and up to date.

2 PROBLEM DEFINITION

2.1 THE CORE PROBLEM

In 2005, the Commission stated its political vision and high level goals for the SES[14] and its technological pillar (SESAR). A full implementation of the SES should have, by 2020:

- improved safety by a factor of ten;
- tripled the airspace capacity;
- reduced the costs of air traffic management by 50%;
- improved the flight efficiency and reduced environmental greenhouse gas, air pollutant emissions and population exposure to noise by 10%.

These goals were expressed at a time when air traffic was still expected to steadily grow and double by 2020. Although since then an economic recession has hit all sectors as well as aviation and traffic volumes are stuck at the 2007 level, the successful implementation of the SES remains high on the agenda, as described in the Commission Report on the implementation of the Single Sky legislation. The relevance of original objectives depends to an extent on the traffic growth continuing at forecast levels. If that would have taken place, it would have been sufficient to retain total costs level, to achieve a halving of costs per flight by 2020. However the task has been made much more difficult with the levelling off of traffic growth, as cuts in absolute cost levels are required as well now. Even if it may be necessary to revise those targets eventually, this does not do away with the need to first maximise efforts to see what a realistic goal is.

The tools for de-fragmentation have been put in place by the two packages; however the overall progress is still falling behind. Ten years later the lack of progress is most pertinent for the development of FABs as well as for overall efficiency of the design and use of the European airspace. Also, in order to reap the full benefits of SESAR, the regulatory framework, oversight arrangements and the modus operandi of service provision need to be prepared to handle the oncoming technological changes, instead of stifling development by forcing new technologies into old operational concepts.

While the progress on **safety** has been satisfactory, improvements in **capacity**, **ANS cost reduction and flight efficiency** have been limited, so that stakeholders have expressed their concerns of efficiency gains being barely noticeable. The report will discuss each of these issues below[15].

Safety

There has been no accident with direct ANS contribution in 2011[16]) and between 2000 and 2011 there have been only three[17] major accidents in Europe, with a considerable ANS

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14 http://ec.europa.eu/commission_2010-2014/kallas/headlines/news/2012/10/ses_en.htm

15 Analysis in this section is based on the Performance Review Report on European Air Traffic Management Performance in 2011, by Performance Review Commission, http://www.eurocontrol.int/documents/performance-review-report-european-air-traffic-management-performance-2011, referred hereinafter as PRR 2011

16 Data for 2012 are not yet available as accident investigations take considerable time, but there are no known events for 2012 either

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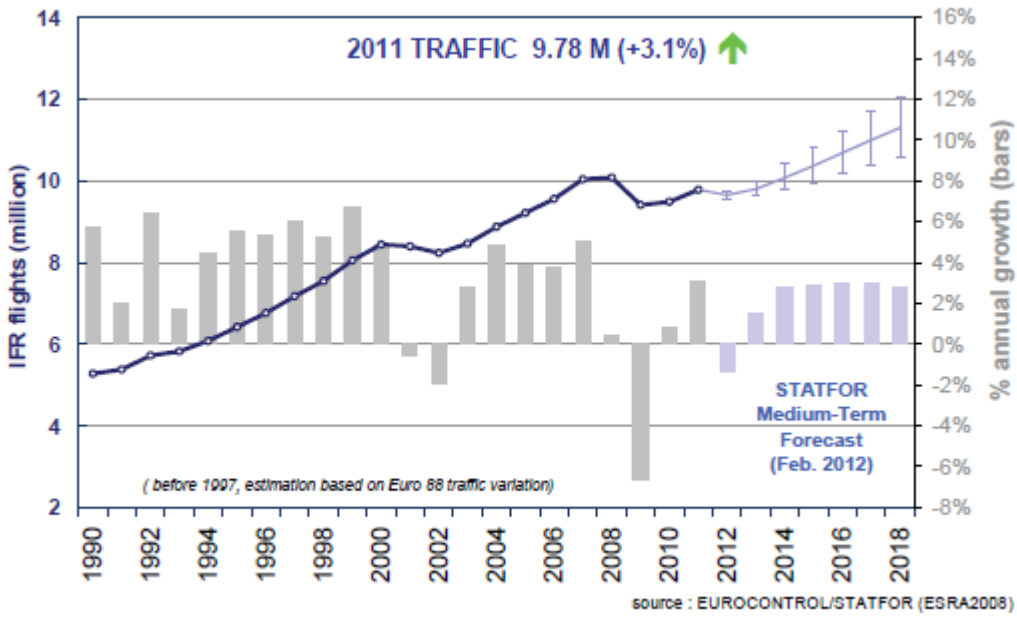
contribution. Whilst almost all accidents are caused by a combination of 5-10 individual causes, studies have shown that generally ANS is a contributor only in about 4% of all major accidents[18] Naturally we need to keep working to not only maintain, but where feasible improve these safety levels, but it needs to be acknowledged that safety as such is currently not a major problem in ANS, nor are rapid improvements with simple changes possible. Instead we need to continue of incremental improvements by continuing the current policies in co-operation between the Member States, EASA and ICAO.

Airspace capacity and delays

Figure 2-1 presents actual and forecasted European air traffic volumes for the period 2008-2011. Due to the economic crisis, air traffic in Europe decreased in 2009 to recover only very slowly afterwards until 2012. Traffic is expected to grow to 11 million flights in 2018, 16% more than in 2011, with annual increase slightly above 2%.

Figure 2-1: Development of IFR[19] air traffic volumes (mainly airline traffic)



Source: PRR 2011[20]

Despite the slow growth in air traffic volumes, the congestion in airspace has prevailed and is still significantly higher than the targeted threshold (target: 1.0 min/flight in average, actual: 1.6 min/flight). In 2011, 18% of all flights were delayed by more than 15 minutes, with total delays of 17.9 million minutes. Figure 2-2 below shows a development in delays that correlates strongly with traffic growth, as the various measures taken to improve capacity have not been

17 Paris Charles De Gaulle 2000, Milan Linate 2001 and Überlingen 2004

18 http://www.atmseminar.org/seminarContent/seminar6/papers/p_042_S.pdf

19 Air traffic is generally divided between Instrument Flight Rules (IFR) and Visual Flight Rules (VFR). Basically in IFR the pilot can fly also by reference to instruments only and receives a more comprehensive service from the ANSP. In VFR the pilots receive less service, mainly navigate by sight, but are also much more free to operate as they wish. For the latter reason there are no sound statistics about VFR flights. At the same time VFR flights have less relevance for central services.

20 STATFOR is Eurocontrol's statistics service

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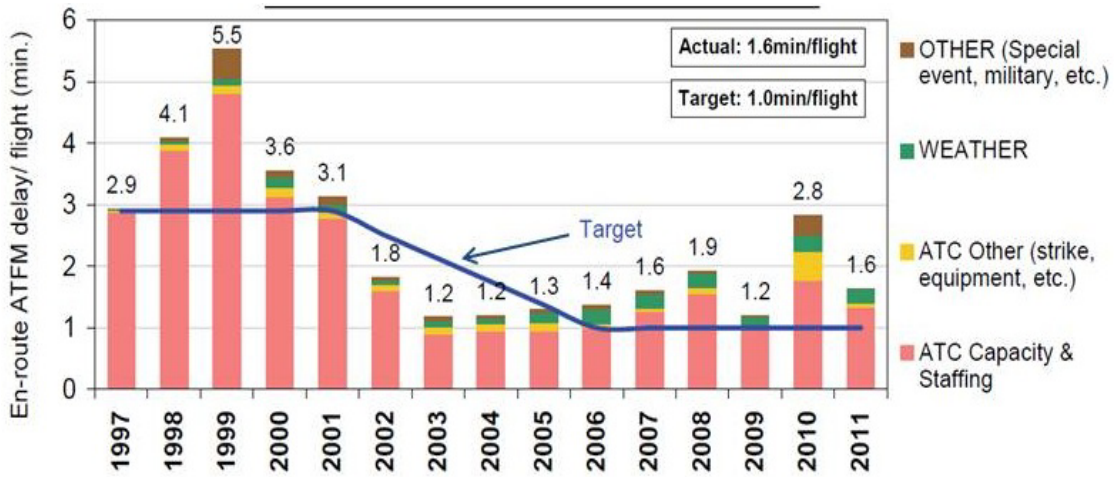
able to fully cover the needs. The 9/11 and SARS crisis gave some respite from the high delays of the late 1990s, but delays start to rise again as traffic picks up, until the economic crisis hits in 2008. Air traffic control capacity and staffing issues contribute the most to the delays.

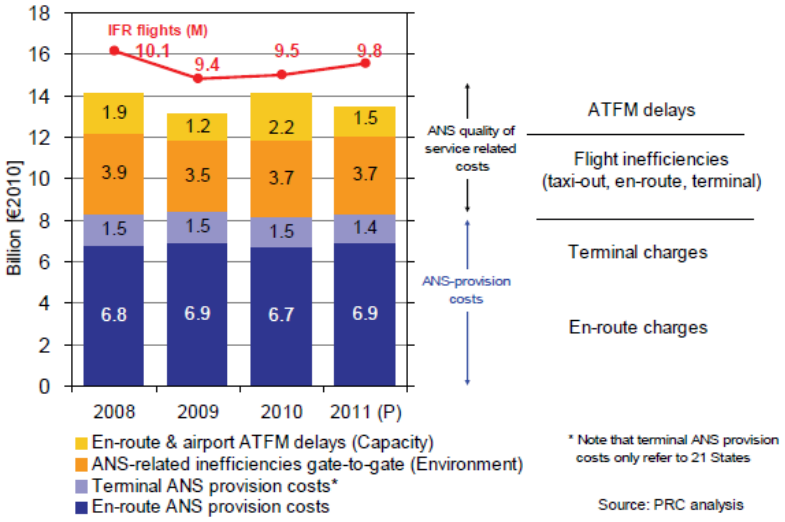
Figure 2-2: Origins of en-route[21] Air Traffic Flow Management (ATFM) delays[20]



Cost of air traffic management

Total air navigation charges accounted for 6.2% of airlines' total operational costs[22] in 2010. The air navigation service (ANS) costs are presented in the figure below, divided into terminal and en-route cost. Initially SES looked only at en-route costs, but progressively as more data is becoming available, also terminal area costs are being addressed.

Figure 2-3: Estimated ANS-related economic costs to airspace users (gate-to gate)[23]



En-route service provision costs comprise more than half of total ATM-related costs[24] and are projected to increase, while terminal ANS provision costs are slightly decreasing.

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21 "en-route" means the portion of the flight where the aircraft is in cruise and not descending to, or climbing from an airport. Often for simplicity's sake this is defined as the part of the flight that is 30-40 nautical miles removed from either departure or arrival airports

22 Depending to great extent on the airlines business model. Generally low cost carriers pay a higher proportion as their other costs are lower.

23 "gate-to-gate" refers to addressing the flight in its entirety, from departure gate to arrival gate

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The fundamental mechanism of ANS provision with the related costs has not changed. Often the cost of service provision per service unit shows actually a negative correlation to demand. Due to the high fixed costs of ANS provision, the overall cost levels stay fairly constant, so that during periods of low traffic demand, the average costs charged directly to the users do not fall, but can actually increase.

Flight efficiency and environment and noise impacts

Emissions from aviation account for approximately 3.5% of total CO_2 emissions in Europe of which approximately 0.2% is due to ANS-related inefficiencies[25]. Air pollutants (NOx), have also been increasing in the EU from 1,8% to 5,8% of the total EU27 emissions[26]. Approximately, the same reductions as to CO_2 emissions can apply to NOx emissions and therefore SES can have significant benefits on the overall air pollutant emissions.

Environmental costs in ANS are a function of flight efficiency[27]. Any shortening of the route towards the optimal great circle route, reduces fuel burn and emissions. The average en-route route extension was 4.6% of the routes flown in 2011 and each 0.1% improvement in that extension reduces fuel burn by 30 000 tons, which translates to 92 000 tonnes of CO_2 as well as a proportionate amount of reduction in NOx and particulate matter.

Furthermore health is impacted by the noise produced during take-off and landing. 1,8 million European citizens are affected by aircraft noise above 55 Lden. Since for most of the EU airports the aircraft routing is the measure with the highest potential for noise exposure reduction[28], SES has a significant benefit potential. The gate-to gate phase ANS-related inefficiencies increased in 2011[29].

Figure 2-4: En-route flight efficiency

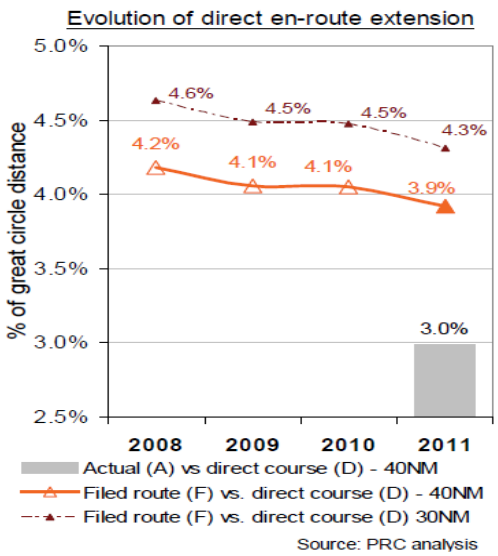

Figure 2-4 displays the development of the additional distance aircraft have to fly compared to the shortest route, corresponding to each aircraft flying an average of 42 km longer than strictly necessary, which is a major driver for unnecessary CO_2 emissions. The grey shading shows the difference between the optimum and actually flown route, whilst the dotted and solid lines represent the difference between the route planned by the operator and the shortest route. The references to 30/40 Nautical Miles refer to how far from the departure/destination airport the calculation starts or ends. This is

24 This includes also the costs of delays etc.

25 PRR 2011

26 European Union emission inventory report 1990–2010 under the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP) – EEA Report – 8/2012

27 The extra distance flown by aircraft in comparison to the shortest route (the great circle route). Currently the average route extension per flight is 42km

28 Study on current and future aircraft noise exposure at and around Community airports – EC DG TREN – B2002/B2-7040B

29 Performance Review Board, 2012, Performance Review Report 2011

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required as the departure and arrival phases involve a high amount of inevitable manoeuvring depending on runways used, weather conditions and other traffic.

Conclusion

The underlying reasons of unsatisfactory results of the SES outcomes in terms capacity improvements, ANS cost reduction and flight efficiency explained above are further analysed below.

Based on the above evidence, with illustrates the existence and scale of the core problems, two main problem areas which have hindered the planned outcomes: (a) insufficient efficiency of air navigation service provision (ANSP) and (b) a fragmented air traffic management system. These problems are interlinked, given that fragmentation is key reason for inefficiencies (and in essence the rationale of introducing the SES). However, there are other reasons for ANSP inefficiencies beyond the fragmentation.

Gaps in the existing legislation prevent adequate addressing these problem areas, as described in the following paragraphs.

2.1.1 *Problem Area 1:* Insufficient efficiency of Air Navigation Service provision

As explained above, the ANS provision[30] remains relatively inefficient in terms of cost- and flight efficiency as well as the capacity offered. Best way to prove this, is to compare Europe with other systems, the best basis for comparison being the United States, which covers similar size airspace with comparable number of air traffic control sectors and airports[31]. ANS in the US is organised as a centralised state-run service. A condensed overview of the differences of the European and US ATM systems related to performance and efficiency is provided in the table below.

Figure 2-5: Comparison of US/Europe key ATM system figures 2010[32]

Calendar Year 2010	Europe	USA	Difference US vs Europe
Geographic Area (million km^2)	11.5	10.4	~ -10%
Number of en-route ANSPs	38	1	
Number of ATCOs in operations	16,700	14,600	~ -13%
Total staff	57,000	35,200	~ -38%
Controlled flights (IFR), million	9.5	15.9	~ +67%[33]
Share of flights to / from top 34 airports	66%	63%	
Share of General Aviation	4%	23%	~ x 5.5
Flight Hours controlled (million)	13.8	23.4	~ +70%
Relative density (flight hours per km^2)	1.2	2.2	~ x 1.8
Average length of flight (within respective airspace)	557 NM	493 NM	~ - 11%
Number of en-route centres	63	20	~ -68%
Number of airports with ATC services	>450	~ 509	~ +13%

30 Annex II provides an overview of the various parties involved in ATM and their roles

31 Pieces of airspace, controlled by a single controller

32 Performance Review Commission of Eurocontrol and American Federal Aviation Administration, US / Europe comparison of ATM related performance in 2010, March 2012. Unless otherwise mentioned, the studies made by the PRB apply to the entire 39 State Eurocontrol area, which is where SES finds application either through EU or Eurocontrol mechanisms

33 It should be noted that in addition to 67% more controlled IFR flights, the US system handles around 5-6 times more Visual Flight Rules (VFR) general aviation flights, many of which use at least some air navigation services, but are not included in flight-time statistics

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Calendar Year 2010	Europe	USA	Difference US vs Europe
Of which are slot controlled	>90	3	

In the US, similarly sized en-route airspace is controlled by a single service provider as opposed to 38 service providers in Europe. The US service provider controls almost 70% more flights with 13% less air traffic controllers. Other significant conclusions to be drawn include that Europe has significantly more flights delayed with a higher delay per flight, aircraft fly more indirect routes and therefore the estimated benefit-potential available to service provision is significantly higher in Europe than in the US.

In addition, a comparison has also been made between Europe and New Zealand, Canada and the USA, which are all regions with similar air safety performance[34]. Figure 2-6 below gives an overview of the key efficiency ratios of ANS providers in these countries.

Figure 2-6: Indicators for cost-efficiency in 2010[35]

Cost-efficiency	European ANSPs	Airways New Zealand	NAV Canada	US FAA for 2010
Air Traffic Controller (ATCO)-hour productivity (in flight hours per ATCO-hour)	0.77	0.55	1.01	1.01
ATCO employment costs per ATCO-hour (in €)	96	59	84	72
ATCO employment costs per composite flight hour (in €)	125	107	84	71
Total costs per composite flight hour (in €)	**419**	**281**	**259**	**321**
Share of ATCO employment costs of the total costs per flight hour	30%	38%[36]	32%	22%

Employment costs between the different regions are not directly comparable due to the differences in social systems. However figures still allow assessing the share of employment cost in overall ANSP costs. The main message that can be derived from the table is that on the majority of cost-efficiency indicators, Europe performs worse than its foreign peers[37]. Total costs per flight hour are significantly larger than for the other three nations.

For the employment costs assessment a comparison between the European countries (see the figure below) is more relevant. Even considering the inherent differences in salary levels between the "new" and "old" member states, discrepancies are significant and indicate existence of important performance gaps between the ANSPs.

34 The comparison with New Zealand is interesting since in New Zealand there is a strong airspace user involvement in the investment planning. For Canada it is interesting since the ANSP is controlled by a private sector service provider

35 CANSO, 2011, Global Air Navigation Services Performance Report 2011 www.canso.org/policy/performance

36 It should be noted that for New Zealand and Canada this proportion is driven also by the geographical factors as a large oceanic or arctic area requires controllers, but relatively little in the way of ground infrastructure

37 Except for ATCO costs, where the difference between the Europe and the US is relatively small. This is further discussed in Section 2.1.1.1

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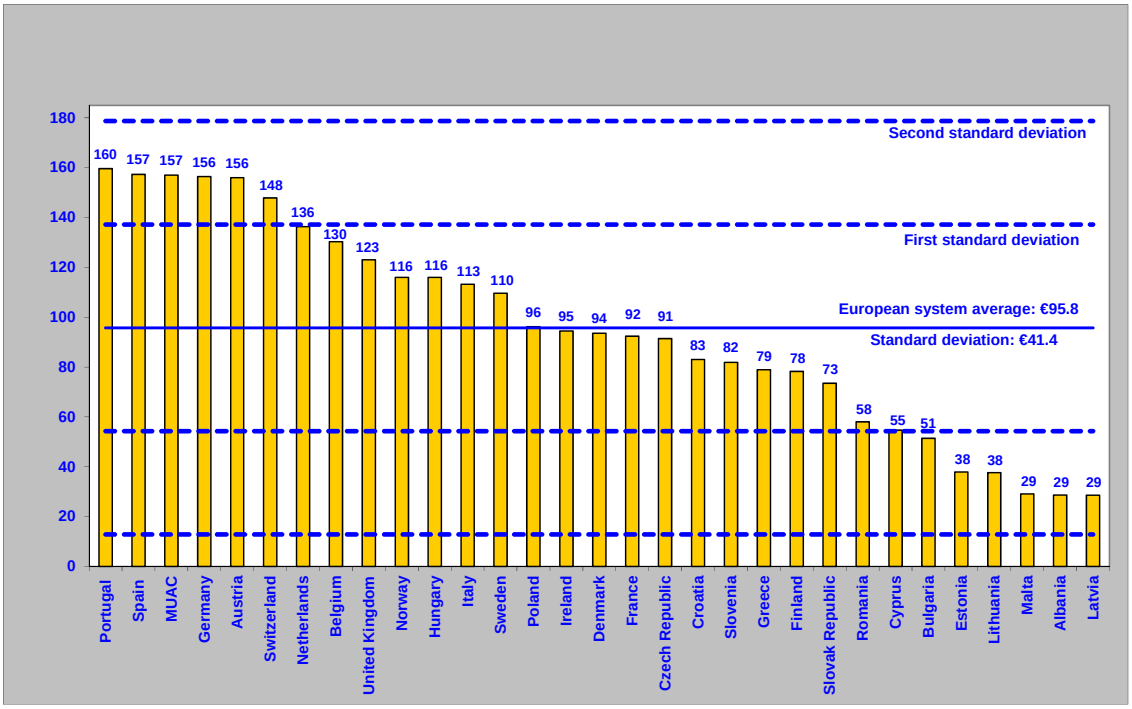
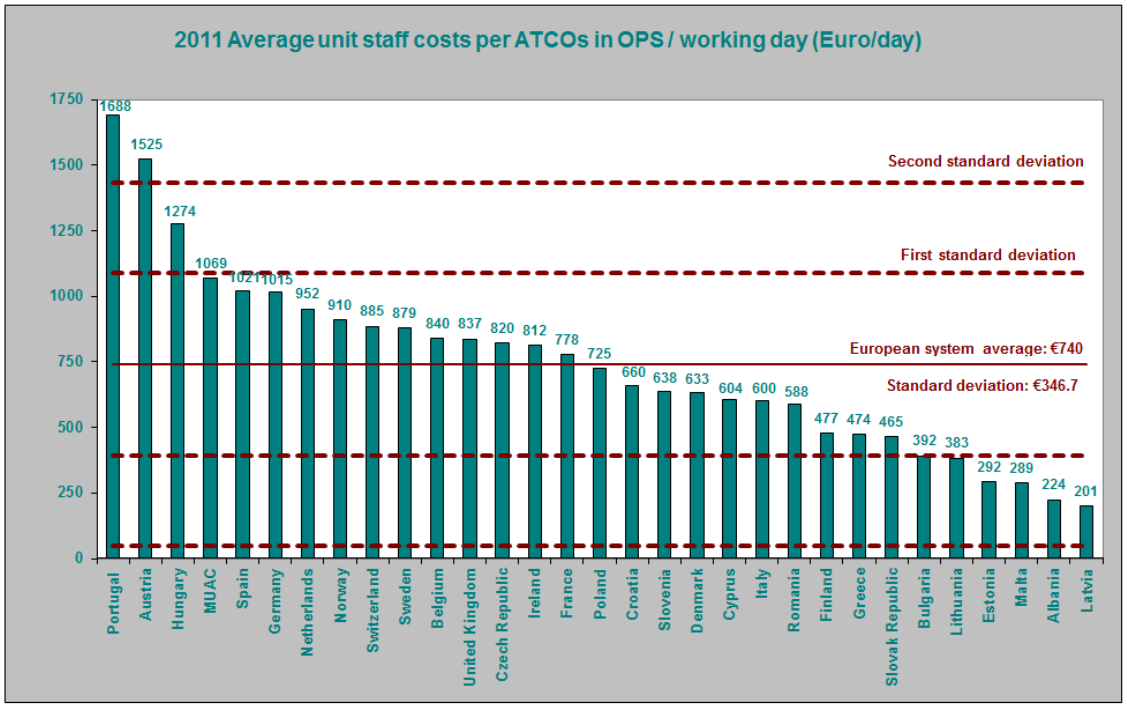
Figure 2-7: Average unit staff costs per air traffic control officer in operational service/hours on duty (EUR/hour)



This variation in ANSPs cost differences becomes particularly revealing if it is reflected against the number of working days in each State, as the amount of days worked varies equally starkly and the resulting comparison bears no correlation with local living costs, but more with bargaining power or historical reasons.

Figure 2-8: Staff costs per air traffic controller/working day



In particular as regards Figure 2-8, it should be noted that employment cost as such is not a problem – quite in the contrary as a wealthy population is good for the economy – but the productivity achieved with that employment cost is what drives the value-added of the ATM system. Overall the stakeholders consider the performance and cost efficiency of service

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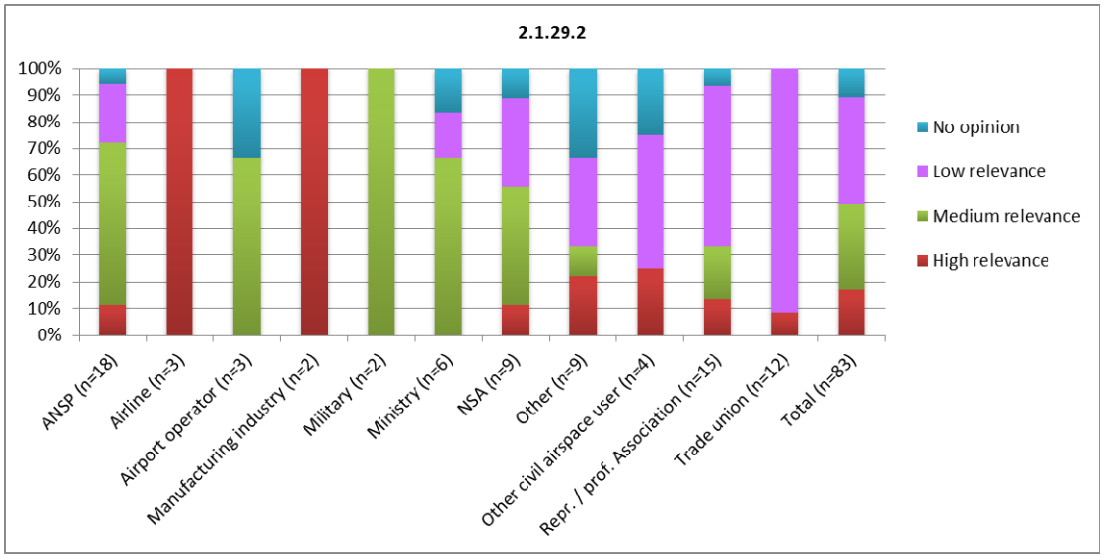
provision as of being a high relevance, although views of different groups were highly divergent.

Figure 2-9: Response to relevance of attributing more focus to reducing costs to airspace users



The airlines were unanimous in considering this of high relevance and even the ANSPs (more than regulators NSAs) attributed considerable relevance to that statement. It appears that SES has so far retained too much of the status quo, instead of focusing on the value added for airspace users.

Key reason for comparative inefficiencies is of course fragmentation of the European airspace. However, there are also other reasons why, despite the de-fragmentation efforts the inefficiency of the ANSPs has not improved as much as expected, in particular this concerns the gaps in ANSP performance and shortcomings in setting up and enforcing the performance scheme. The SES I and in particular SES II initiatives have attempted to mitigate these root causes, but progress has been less rapid than expected, for reasons explained in the next sub-chapters.

2.1.1.1 The gaps in ANSP performance

Root cause: ANSPs are to a great extent natural monopolies

The business model on which ANS provision is based and the related operational decisions impact significantly the efficiency of different national ANSPs. The provision of ANS in Europe is still based on national sovereign airspace and dominated by the national monopoly service providers as designated by state, often for long period of time. There is lack of motivation for ANSPs to improve their performance as they are not conditioned to market mechanisms. Only one major service provider[38] can be considered to operate mostly as private enterprise. Much of the time ATM is seen as a public service despite moves towards corporatisation.

Currently the air navigation services can be provided as packaged services consisting of (a) the core services, such as air traffic control and alerting or urgency services and (b) support

[38] The UK based NATS, is 49% privately owned and also to some extent seeks to expand its operations beyond the national airspace. Other ANSPs with private company form are still close to 100% publicly owned.

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services[39] such as meteorological services, aeronautical information services, training as well as various communication, navigation and surveillance services. The highly specific nature and the technological situation of the core services make these natural monopolies, therefore making it difficult to introduce true market mechanisms. Provision of support services is more flexible by their nature and use of market principles could be considered to push for better performance and efficiency. Current regulations expressly allow and even recommend[40] provision of the support services as separate unbundled entities, but only two relatively small cases[41] are known Europe-wide of such unbundling. But current rules do not provide guidance on how such unbundling should be carried out.

The table below indicates that the share of costs for air traffic management is slowly decreasing while the share of communication/navigation and surveillance service costs is stable and the share of costs for aeronautical information and meteorological services is increasing.

Figure 2-10: ANS costs by service; share of total costs, 2009-2013

	2009 (Actual)	2010 (Actual)	2011 (Actual)	2012 (Forecast)	2013 (Forecast)
Air traffic management	72.6%	71.2%	71.5%	71.3%	71.0%
Communication, navigation, surveillance	19.2%	18.1%	18.4%	18.1%	18.3%
Aeronautical information	2.3%	3.1%	3.2%	3.1%	3.2%
Meteorological services	4.4%	5.7%	5.6%	6.0%	6.0%
Other costs	1.5%	1.9%	1.3%	1.5%	1.5%

Source: PRB[42]

The cost of the support services is also what differentiates European service providers from their counterparts elsewhere. For example, whilst the difference in the number of air traffic controllers between the Europe and the US is relatively small, the total staff of the US ANS provider is almost 40% lower than in Europe. The latter implies that Europe has a relatively higher number of staff linked to support services. Therefore efficiency in proving these support services is an important factor in improving overall performance and efficiency of ANS provision.

Many of the support services are expected to face substantial technological change in the near future through the SESAR project, which would fundamentally change the provision of ANS. Therefore, it is especially relevant to reconsider the way the provision of support services is organised.

The airlines, airport operators and manufacturing industries stressed in the consultation the need to change the old business models in order to optimise the service provision, while the service providers, ministries, and about half of the NSAs see this as an issue of lover importance. Trade unions are strongly opposed.

39 Typically Meteorological (MET), aeronautical information (AIS), communication, navigation and surveillance (CNS) etc. services.

40 Recital 13, Regulation 550/2004

41 Swedish LFV and Scottish HIAL outsource CNS services

42 PRB, June 2012, Overview of Terminal ANS costs and charges for States participating in the SES Performance Scheme (RP1), Data collection, verification, consolidation and dissemination, Preliminary data

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Root cause: ANSP operations lack customer focus

As ANSPs operate in a *de facto* monopoly environment, there has been little incentive to focus on customer needs. Vis-à-vis their customers the ANSPs operate always in a monopoly situation. In these circumstances the main tool under the current legal framework for ensuring communication between the ANSPs and operators is an on-going consultation process on service provision. Transparency in reporting and consultation with stakeholders should be basic business practice and is fundamental to the performance based approach that underpins the SES. However airlines and other airspace users are not satisfied with the quality of consultation in some Member States:

- while all ANSPs consult on their investment programme, the level of detail varies significantly;
- while users would prefer to receive information covering medium term plans, ANSPs are finding it difficult to commit to longer term plans given the volatility in traffic demand.

Of course, consultation is not a one way street. Whilst the regulations impose requirements on the ANSP/NSA, the airlines are also responsible for the quality of consultation. Part of improving consultation may be for the users to be more pro-active in the consultation process.

Current rules prescribe consultation, but not the depth and breadth of that interaction. Overall, it appears that providing more detail of the necessary format and procedures of consultation could help to improve consultation practices. Consultation could also vary in its level of influence from pure advisory to participating in decision-making.

As expected, the airlines and the manufacturing industries find customer focus to be more vital than service providers and NSAs. But also the latter considered that there are matters to be improved.

Root cause: Ineffective regulatory role of NSAs

The intention to set out rules for the establishment of National Supervisory Authorities (NSA) within SES was for Member States to establish effective, fully-resourced supervisory bodies, independent of service-provision and capable of supervising safety and service provision activities. In the context of the Performance Scheme[43], NSAs play a key role through the elaboration of performance plans, performance oversight, target settings and their monitoring. The key to efficiency in these tasks is that the supervisory functions are separated from the service-provision being supervised. However due to a political compromise made in 2003, the separation is required only at functional level under the SES rules. This creates a problem for true independence as has been recently witnessed in EASA audit results (see below for examples).

A principal aspect of independence is the adequate funding and resourcing of NSAs which, in turn, directly affect NSA effectiveness. Member States are responsible for ensuring that NSAs have sufficient resources and capabilities to perform their tasks. Clearly some States are having difficulties in making the necessary resources and expertise available. Even though the SES legislation allows NSAs to recover their costs via route charges, the NSAs do not always have the power or independence to enforce this. Consequently, across Europe, the institutional and financial situation of NSAs is mixed and there exists a large variation in NSA oversight

[43] See section 2.1.1.2 on the functioning of the performance scheme.

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capabilities as shown by the self-reporting systems and discussions from the NSA co-ordination platform and the initial audits.

The task force of the NSA coordination platform[44] concluded that some States have difficulties in addressing the independency issue adequately since the separation from ANSP is only required functionally. There are a total of 37 NSAs in the 29 SES States (a number of States have a small separate NSA e.g. to oversee meteorological services). In four States the main NSA is functionally separated and in four other States the main NSA is fully separated, but either MET or AIS NSA is functionally separated[45], while the rest of NSAs have more complete institutional or organisational separation. However, even when being institutionally separated from the ANSPs, already the first EASA audits show that a number of NSAs suffer from a lack of *real* independence.

The first few audits performed by EASA on the Member States authorities have confirmed what was previously noted based on anecdotal evidence - the authorities are sometimes in dire financial troubles and lack both expertise and enforcement powers. NSAs are sometimes also uncomfortably close to the ANSPs that they are supposed to oversee. Typically in the discussion in the Single Sky Committee concerning ANSP performance targets, the Member States almost invariably tend to defend their ANSPs against the interests of the airspace users that pay for the system. From EASA audits[46] of five NSAs in 2012, a larger number of different shortcomings were noted, including the following examples:

- Entire staff of NSA on detachment from the ANSP to be overseen;
- Total NSA staff less than 20% of the numbers assessed to be required in founding decision;
- Director of NSA reporting to the highest accountable person of the ANSP;
- The ANSP itself issuing air traffic controller licenses to its staff;
- Service provision allowed without a valid certificate;
- NSA lacking powers to inspect ANSP premises.

The IA support study concluded in addition that:

- Independence should be also considered vis-à-vis other government bodies. In cases where NSAs report to the Transport Ministry, their position is more likely to be influenced by political interests rather than operational efficiency considerations.
- The relative influence of NSAs and ANSPs sometimes hurts NSAs - ANSPs are often designated by a government decree or similar which puts them sometimes higher in the hierarchy than the NSAs.

Apart from issues of conflict of interests, NSAs have not always developed sufficient expertise in ANS and are therefore at a disadvantage in developing performance plans.

Airlines indicated during the consultation that there is often no independent oversight by the NSA. At the same time it should be noted that NSAs themselves do not agree that persistent resource problems would have caused problems with ensuring sufficient oversight, and only a

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44 Summary report of activities of the NCP Task Force on NSAs in SESII, 6/11/2012.

45 https://www.eurocontrol.int/sites/default/files/content/documents/official-documents/reports/2012-sesreport2011.pdf

46 N. B. the audit results are confidential between EASA, Commission and the audited State, so it is not possible to go into more detail in this text or to list findings in relation to the organisational structure as it would make identification possible. However already now it is clear that the best results have been in States with full separation and most problems have been encountered in States with only functional separation.

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small number of stakeholders "fully agree" that NSAs lack the required resources to do their job efficiently.

In conclusion, optimising the performance of ANSPs requires strong oversight capabilities. Where NSAs are not effective and powerful enough, the ANSPs are not pressured and motivated to provide more efficient services.

2.1.1.2 Shortcomings in setting up and enforcing the performance scheme

Root cause: Inefficient governance mechanism for setting up and enforcing the performance scheme

The SES II Performance Scheme[47] aims to improve the overall efficiency and performance of air navigation services through a system of binding performance targets. Currently, these targets are adopted by Commission decision through comitology procedure with qualified majority voting by Member States. But this still leaves a few large Member States with the possibility to block ambitious target setting and thereby protect their state-owned service providers from change.

Box 2-1: Performance scheme arrangements

Performance targets are set at EU level in the areas of cost-efficiency, capacity, safety and environment. Subsequently, Member States have to prepare performance plans and set local targets that should be consistent with the agreed EU-wide target. Incentives may be used by the States to further motivate reaching and exceeding the national targets. The **Performance Review Body (PRB)**, which supports the Commission in the implementation of the performance scheme, is required to exhibit the necessary competencies and impartiality to provide expertise, recommendations and general support to the Commission and Member States. **Eurocontrol** has been designated as PRB until June 2015 and is supported by the performance review unit (PRU).

The performance scheme operates over different reference periods, e.g. the first reference period (RP1) covers the years 2012-2014 The **Member States** approve in the **Single Sky Committee (SSC)** the EU-wide targets which the **Commission** has proposed on the basis of **PRB** recommendations. At the national level, **the NSAs** are responsible for determining performance targets consistent with the EU-wide targets. If necessary the Commission may recommend revisions of targets if they are inconsistent with the EU targets. The final decision on targets rests with the SSC.

When the national targets are agreed, the ANSPs are responsible for adapting their business plans to deliver the targets. This will be checked by the NSAs, Commission and the PRB. As demonstrated in the box above, the entire scheme is based on a system of checks and balances between the various players – the Commission, PRB, Member States/the Single Sky Committee (SSC), NSAs and ANSPs. Stakeholders have further emphasised that it is necessary to respect the expert and industry views in setting ambitious, simple and achievable targets.

Following the assessments of the initial national performance plans for reference period 1 (RP1), the Commission found 20 States falling short on the cost efficiency targets and 10 States on capacity. Initially this shortfall amounted to a total of € 1.17 billion of additional cost over the EU targets, with a gap in respect to the cost-efficiency target evaluated at € 256 million over RP1 and € 922 million in additional delay costs (see Box 2-2 below). Member States revised their initial performance plans, however, there was a significant difference between the individual contributions of Member States to close the identified gaps. A decision was finally made to accept the revised performance plans even though the EU target was not fully met. This was based on the view that a lot had been achieved in the first reference period, relatively little could be obtained partly due to significant changes in underlying traffic forecasts, and the cooperation of Member States was needed in adopting the plans.

[47] Regulation 691/2010

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Box 2-2: The progression of target setting for cost efficiency and capacity in RP1

Cost efficiency

The following table compares the EU target and the values achieved through the performance plans:

	EU average determined unit rate (€)		
	2012	**2013**	**2014**
(a) EU target / reference values	57.88	55.87	53.92
(b) First round of performance planning	58.08	57.04	55.22
(c) Second round of performance planning (accepted targets)	57.73	56.68	54.83
(d) Difference (c) – (a)	-0.15	0.81	0.91
% (d) / (a)	-0.3%	1.4%	1.7%

The impact of the shortfall (d) is estimated by the PRU to be €189 million over RP1 (2012-14). Before the revised plans, the impact was € 256 million. I.e. the intervention of the revised planning could be said to benefit the industry by € 67 million, if these values were achieved.

Capacity

Average en route Air Traffic Flow Management (ATFM) delay was 1.1 minutes per flight in 2011, down from 2.0 minutes in 2010 and 1.0 minute in 2009. (Network Manager Annual Network Operations Report 2011.). The following table compares the EU target and the values achieved through the performance plans:

	Minutes of delay per flight		
	2012	**2013**	**2014**
(a) EU target / reference values	0.7	0.6	0.5
(b) First round of performance planning	1.18	1.04	0.76
(c) Second round of performance planning (accepted targets)	1.07	1.0	0.67
(d) Difference (c) – (a)	0.37	0.4	0.17

The impact of the shortfall (d) is estimated by the PRU to be € 734 million over RP1 (2012-14). Before the revised plans, the impact was € 922 million. I.e. the intervention of the revised planning could be said to benefit the industry by € 188 million, if these values were achieved.

Main weaknesses in the current governance mechanism seems to be that it is not yet effective enough in (a) avoiding conflicts of interests and (b) ensuring availability of necessary expertise and information.

Conflicts of interest

The key requirement for the scheme is independence between PRB/PRU, NSAs, Member States and ANSPs. In particular the success of the performance scheme relies significantly on the NSA/ANSP interaction. But, as already mentioned above, NSAs are not always fully independent from ANSPs.

This is likely to lead to a sub-optimally lower ambition in performance plans.

From the first regulatory period, it can be concluded that there has been insufficient independence and impartiality in the process as:

- NSAs do not challenge their ANSPs; and many Member States defend their positions in the SSC as if they were national ANSPs (and some try to include ANSPs in their delegations).
- SSC members actively seek to minimise targets in the target setting process in defence of their national ANSPs – they see their task as maintaining ANSP revenues, avoiding the risk of loss of employment, impact on national budgets and/or risk of industrial action.
- At each stage the SSC remains in a decisive role – thus far we have seen that SSC members have argued for lower EU level targets, and have subsequently resisted moves for performance plans to be fully consistent with the EU targets, and against action against Member States that have not delivered on this.

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Lack of expertise and asymmetry of information

Given the lack of resources, NSAs are often forced to rely on the same ANSPs for expertise that the NSA is intended to oversee. The PRU is restricted to advising on factual comparisons and forward projections, whereas the NSA should be looking deeper into ANSP business plans to make judgements on the level of challenge and feasibility of the proposed ANSP business plan. There exists also asymmetry of information between the PRB and NSAs/Member States and the ANSPs. This means that the PRB has only high-level information on which to challenge ANSPs and no insight into their detailed business plans. As a result, the ANSPs are well placed to exert undue influence over their performance targets.

In conclusion, the SES framework requires much stronger implementation and enforcement of the performance scheme by Member States in particular. Measures to ensure the independence, resources and expertise of the key players – particularly the NSAs - are needed to ensure that performance targets are both meaningful and properly enforced.

2.1.2 Problem Area 2: A fragmented ATM system

The European ATM system consists of 27 national authorities overseeing over a hundred ANSPs (counting en-route and local), with the associated variance in systems, rules and procedures. Each Member State has at least one Area Control Centre (ACC) and many aerodrome control facilities. As they are set up on a national basis, Area Control Centres are often inefficiently small. Other comparable regions have one consistent feature - a single ANSP, overseen and regulated by a single authority. Eurocontrol commissioned a study in 2006 to research the impact of fragmentation on the efficiency of the European ATM system.

Figure 2-11: Cost of fragmentation in European ATM systems[48, 49]

	Cause of fragmentation	Annualised costs	% of cost of fragmentation
Common issues	Piecemeal procurement (mainly ATM systems)	€30m - €70m	14%
	Sub-optimal scale in maintenance and in-service development (mainly CNS)	€10m - €15m	
	Fragmented planning	€60m - €120m	
ACCs	Economies of scale in ACCs (operating costs)	€370m - €460m	53%
	Economies of scale in ACCs (capital cost)	€105m - €140m	
	Constrained sector design (flight efficiency benefits)	€50m - €100m	
ATM systems	Lack of common systems (operating costs)	€150m - €215m	23%
	Lack of common systems (capital costs)	€30m - €90m	
	Increased coordination at interfaces	€10m - €20m	
CNS infrastructure	Optimum location of en-route navaids	€3m - €7m	4%
	Overprovision of secondary radar	€15m - €60m	
Associated support	Economies of scale in training, administrative costs and R&D	€40m - €100m	6%
	Total costs of fragmentation	€880m - €1400m	100%

The table above gives an overview of the additional costs caused by the fact that Europe has a large number of service providers, each procuring their own systems, mostly training their own staff, creating their own operating procedures and being limited territorially to providing services in a small airspace. In addition to cost-inefficiencies, fragmentation has a negative

48 "The impact of fragmentation in European ATM/CNS 2006" by Eurocontrol Performance Review Commission; April 2006 http://www.eurocontrol.int/sites/default/files/content/documents/single-sky/pru/publications/other/fragmentation.pdf

49 ACC = Area Control Centre, CNS=Communication, Navigation and Surveillance services.

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impact on mobility of staff and flexibility of service. Reducing these inefficiencies has been the core idea of SES. Actions to this end are taken at 2 levels (a) modus operandi of national ANSP is step by step harmonised so that the existing network of providers would function as if it was a single provider and (b) new supranational structures, such as cross-border Functional Air Blocks (FABs) and EU Network Manager have been created and gradually exploited.

However, the results of both FABs and Network Manager do not yet meet the expectations placed on them by the legislation.

2.1.2.1 Performance of the FABs is not meeting expectations

Root cause: FABs are not performance driven - insufficient value-added of the current scheme

Over time there have been several attempts to reduce fragmentation and in fact the original intention when the Eurocontrol organisation was created in 1963, was that it would take over service provision in the upper airspace of all its contracting parties. This idea was resurrected again with SES I, but like in the 1960's, the Member States rejected more radical top down ideas e.g. to have a single airspace controlled by a single provider. So FABs were considered a key tool of SES I and SES II for facilitating a co-operative regional approach to planning and operation of the ATM system with the goal of reducing fragmentation and costs of service. In 2009, with SES II, FABs were redefined in the service provision regulation as arrangements *based on operational requirements and established regardless of State boundaries*[50]. The FABs were expected to help on performance and in particular to:

- improve airspace efficiency by reducing airspace fragmentation by adopting cooperative approach;
- consolidate service provision leading to savings in operational costs;
- rationalise support services and facilitate system harmonisation;
- rationalise infrastructure procurement and utilisation;
- achieve technical interoperability leading to better safety, mobility and lower costs.

According to the FAB plans made in 2008, about half of the FABs should have been operational in the sense of optimising airspace and services by 2013. To speed up development a 4 December 2012 deadline was included in SES. However, in reality, despite the firm legal deadline, the situation has not improved markedly and is in fact worse lagging behind even the 2008 plans. Even assuming "operational" is understood just as delivery of services consistent with the FAB implementation plan, only the UK-Ireland FAB is largely on track.

Even for the UK-Ireland FAB, the concrete benefits to airspace users have been minimal and could possibly have been achieved without the FAB as well. At the time of writing, the Commission is in the process of pursuing pre-infringement procedures against the Member States for failing to implement the FABs, but that alone will clearly not be enough to rectify the situation – there are plainly difficulties in delivering operational benefits. The infringement procedures will take considerable time and will in any case only force States towards formal compliance with the existing rules, whilst what is needed are innovative ways of rearranging service provision through industrial co-operation so that performance would be maximised.

There have been many different reasons as to why the FABs have failed to deliver:

- Airspace optimisation was originally considered a major benefit of FABs, however resolving sovereignty issues and associated liability questions, and developing State and

[50] Regulation 549/2004 Art 2(25)

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NSA level agreements has been slow. Furthermore, the majority of FABs are two-State arrangements, thus the potential to realise airspace design efficiencies has been limited.

- Many of the cost-benefit analyses conducted for FABs appear to have been overly optimistic about benefits and lacking in risk analysis, eventually leading to serious delays exemplified by the fact that all but one of the FABs are still considered non-operational.
- All FABs have produced plans, however many of these are essentially statements of intent without necessary detail for operation or specific actions. There are few identifiable joint projects that could suggest that most FABs are imminently going to become "operational".
- Effectiveness of FAB internal governance is questionable as the requirement of unanimity waters down ambition.
- Support services have been identified by FABs as an area of potential rationalisation. However, beyond the few commercial arrangements whereby one ANSP provides training services for another, little has been done here.
- FABs expected savings to come from joint infrastructure projects. However, two key issues hindering progress here are often a lack of commonality in equipment between the neighbouring States that have formed FABs and/or differences in system age making synchronisation of development plans costly.
- Whilst it could be said that the FABs have not yet had time to deliver due to the delays in FAB-projects, it is evident from the plans that in any case, their contribution to defragmentation would not have been at the level expected and required for reaching the overall SES targets.

As a result FABs have thus far been primarily exercises in regulatory compliance and have suffered from a lack of strategic and operational vision. This is also evidenced by the fact that some service providers[51] are establishing business co-operation arrangements that go across FAB boundaries. As such it is a positive sign that ANSPs are looking creatively for synergies, but this trend suggests less than full confidence that the established FABs will provide the natural home for such arrangements. Therefore it needs to be also examined whether the basic assumptions behind FABs were wrong, or whether their implementation has been flawed to the extent that we are not seeing the expected gains.

Stakeholders find that FABs do not effectively comply with the legal obligations and do not yet deliver the expected benefits. Service providers have commented that FABs need a stronger institutional framework and a common management system. The majority of the stakeholders (most of them the service providers and professional associations) feel that FABs should be increasingly focused on functionality and a flexible search of synergies.

2.1.2.2 Performance of the Network Manager is not meeting expectations

Root cause: Weak role and limited scope of the Network Manager

One of the major innovations in SES II was the creation of a Network Manager entity to cover certain functions that were deemed to be best carried out at network level as opposed to FAB or national levels. The initial operating scope of the Network Manager covered the following four functions[52]:

[51] E.g. The Irish-Austrian-Croatian-Swedish-Danish COOPANS project, https://www.iaa.ie/COOPANS

[52] A possibility of adding additional functions through comitology was included in the 2009 SES2 package. See art 6(4) of Regulation 551/2004

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1. **Air Traffic Flow Management** (ATFM), which processes flight plans filed by aircraft operators and plans the high level traffic flows in Europe. The aim was to avoid demand peaks that exceed the capability of the ANSPs to deliver service safely and efficiently.
2. **Route design**, which aims to design the routes used by aircraft based on the traffic needs, as opposed to national ANSP or political considerations.
3. **Co-ordination of radio frequencies** amongst the thousands of stations using aviation bands.
4. **Co-ordination of radar transponder codes** to rationalise the use of this scarce technical resource so that the radar systems can differentiate between all aircraft.

But these were only the initial ideas, and now that SESAR is moving into its deployment stage, new concepts such as 4D trajectory management of traffic flows or System Wide Information Management (SWIM) have been validated[53] and need to be implemented.

Eurocontrol, who has been designated as the Network Manager, has done a good job in getting the new system off the ground. However, all of these Network Management functions are to be delivered using a co-operative decision making process involving the States, ANSPs and the various airspace user groups (airlines, military, general and business aviation). Whilst the intention was to create a strong industry governance for the Network Manager leading to clear executive powers, the Network Manager effectively does not have any competence to impose its decisions on the States. In practise the ANSPs may choose to disregard the Network Manager in their actions. Furthermore if the Network Manager's actions are blocked by ANSPs, conflict resolution is envisaged to take place in the Single Sky Committee, with an obvious conflict of interest given that Member States tend to reflect ANSP views. Hence under the current legal framework, decision making by the Network Manager has tended to aim at consensus with the inevitable result of often weak compromises.

The oversight of the Network Manager has been entrusted to EASA who has remarked on the shortcomings of the governance system and the consequent difficulty in reaching many important decisions. Furthermore the study performed to support this impact assessment pointed to a number of other problems which – despite some good progress - hamper the Network Manager from reaching its full potential:

- Whilst the Network Manager is involved in basic route design, the ANSPs and FABs have often not embraced its capabilities fully and have not included in their development plans measures against sub-optimal cross-border sectorisation and associated routings.
- Network Manager is reliant on the ANSPs/FABs producing their deployment plans, but there is no independent review to ensure the plans will be timely and effective.
- The FABs do not actively involve the Network Manager in their planning and implementation processes.
- The States may choose to ignore the planning especially in the area of managing scarce resources, such as radio frequencies or transponder codes.

In conclusion, the study has assessed the Network Manager concept to be useful[54], but the actual implementation is being weakened by ineffective relationship between the Network Manager and ANSPs/airspace users. In addition, its operations cover only a subset of the total picture needed for performance optimisation under the future SESAR umbrella, which changes technology infrastructure considerably.

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53 For a more detailed presentation of these new services, see the latest version of the Master Plan document https://www.atmmasterplan.eu/

54 See SES 2+ support study section 3.6.2

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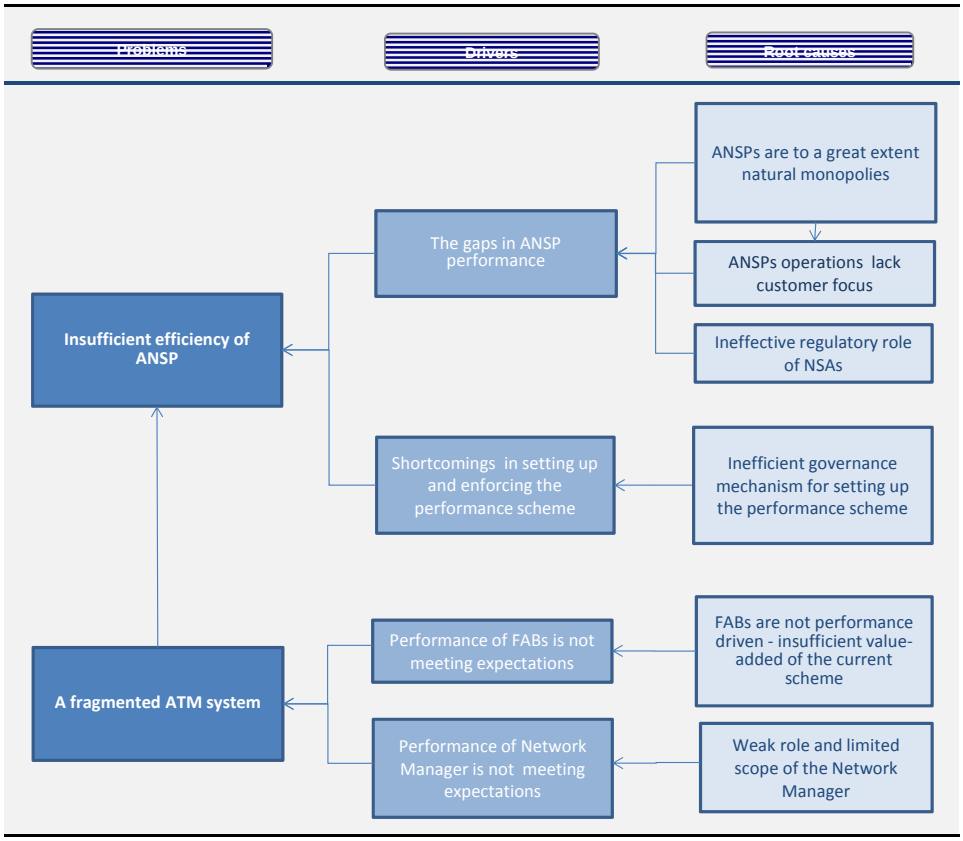
2.1.3 Conclusion

Figure 2-12 is presenting the interconnection of the problems, drivers and their root causes analysed in this chapter.

Figure 2-12: Problems, drivers and root causes



2.2 THE MOST AFFECTED STAKEHOLDERS

This initiative affects the Member States (NSAs and other authorities) which are responsible for supervising and arranging ANS provision, and Air Navigation Service Providers and their staff who need to adjust their operations to meet the better performance objectives. It also affects airspace users (airlines, military and business and general aviation) who shall benefit from the efficiency gains and congestion reduction. The Commission and EASA and their staff will be affected if the governance structures linked to the SES implementation are to be revised. Indirectly the initiative affects aerodrome operators, passengers and those who use air freight services. Finally, new operators with a potential to enter the market for ANSP support services', could benefit from new business opportunities.

2.3 BASELINE SCENARIO

The assessment of possible future developments in case of the baseline scenario (i.e. continuation of implementing existing SES framework) demonstrates that despite some progress, the goals of SES by 2020 will not be achieved. For example the most recent PRB data indicates that even if the current targets are reached (unlikely on current projection) we will

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only cut the en-route unit rate[55] from the current € 57.4 to € 48.8 by the end of 2019 – a far cry from the SES overall target or halving the costs.

Baseline developments of the individual problem drivers are discussed below[56].

Gaps in ANSP performance

Improvement of European *ANSP performance* would continue, but relatively slowly retaining the wide performance gap between Europe and other world regions. Furthermore, as demonstrated by the rise in delays during the minor recovery of 2010-2011[57], the offer of services will not be able to keep up with the post-crisis demand increase, so capacity problems would increase. Technological developments[58] would gradually push the ANSPs towards new operational approaches and some Member States could decide to organise provision of ANSP support services on a competitive basis. However even at best, progress will be incremental and uneven.

ANSPs continue of being to the great extent *natural monopolies.* Although possible, it appears unlikely that the States will undertake such moves any more than they have done since 2004, unless external pressure is available. There are also presently no signs that the performance scheme would be causing ANSPs to re-think how support services could be made more efficient.

As regards *customer focus*, the regulations already impose a requirement for extensive reporting of plans, for monitoring and reporting[59] of performance, and involvement of key stakeholders in regular consultation. Member States have established mechanisms for consultation and ANSPs continue to use them, but the improvement of the effectiveness of the process across the board is far from certain. According to the airspace users' comments, there is a major gap between informing users and taking their needs on-board. In theory the performance scheme should reflect users' interests via effective use of consultation, in practice consultation has had a little effect on the targets levels.

It is expected that the respective roles of *NSA and ANSP, as supervisor and supervised*, would become progressively better defined and implemented, supported by the discussion forum set up at European level (i.e. the NSA co-ordination platform). Developments in technology could help this process, e.g. by improving availability of safety data and analysis, thus enabling better oversight on European and sub-regional basis (provided the NSAs would agree to translate and share that information). Inadequate levels of funding and independence could be mitigated to some extent after EASA audits of every NSA and subsequent corrective actions or infringement procedures. But without full separation of NSA and ANSP as required under the EU law, this additional resourcing of NSAs would be likely to come from the ANSPs, which could exaggerate conflicts of interests. In any case, inadequate resourcing continues to be a barrier to full and effective NSA operation, not only in terms of manpower but also technical skills and independence. NSAs could start using the opportunity to recover their costs via the route charges or gain enhanced independence by more radical separation from ANSPs, but we

55 En-route unit rate is an index determining the charge paid by the aircraft for ATM services during the cruise part of the flight. Normally the charge is a function of the unit rate, the distance flown and the maximum weight of the aircraft. Terminal charges around the airports are determined separately

56 See also description of the "do nothing" options in Annex V for a more detailed description of the baseline.

57 See figure 2-2

58 Regulation 552/2004 allow for implementing measures to introduce new concepts of operation in line with the SESAR Master Plan. Together with the SESAR minimum scenario (implementation pack 1) improvements this would e able to push some already existing and mature technologies to more widespread use. http://tentea.ec.europa.eu/download/calls_2010/fab/fab_call_2010_annex_ii.pdf

59 E.g. Regulation 549/2004 Art 12, Regulation 550?2004 art 12(2), Regulation 691/2010 art 17(3) etc.

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have no indications of this. The resource constraints would continue to limit the ability of NSAs to focus more on cross-border service-provision, both bi-laterally and in the FAB context. The implementation of rules would continue to be patchy, and could even lead to safety risks and certainly to a delay in the deployment of SESAR programme. On the other hand, the continued affinity to the entities being overseen keeps the ambition performance levels low and prevents the high-level SES targets being met.

Shortcomings in the setting up and enforcing of the performance scheme

It is expected that under the baseline scenario for the new reference period (RP2 to be started in 2015, RP3 to be started 2020) the targets will follow the trendline of RP1's moderate results:

- The PRB and PRU may be subject to continued pressure from the industry. The downwards pressure may even increase where shortcuts in RP1 (such as deferred investment) need to be addressed in RP2.
- The "lowest common denominator target" would be agreed by the Single Sky Committee. Overall, in discussing the matter with the Commission, the PRB has estimated that the cost efficiency targets could have been an additional 1-2 percentage points higher in ambition than actually achieved in RP1.
- Pressure to have looser delay targets if traffic is recovering, due to insufficient investment throughout RP1.

Performance of the FABs is not meeting expectations

The baseline assumes that the FABs have not had sufficient time, incentives and motivation to implement changes. Accordingly their slow and uneven development continues, mostly driven by the impetus to be provided to FABs by the RP2 in the performance scheme. Under the current legal framework[60] the Commission cannot incentivise progress during the implementation phase by establishing explicit compliance criteria or firm deadlines. In any case, the progress will be slow and fundamental impediments linked to lack of flexibility, expertise and funding would remain.

Performance of the Network Manager is not meeting expectations

The Network Manager is still evolving from its original mandate to include functions that underpin its mission, thus the baseline should recognise the potential for some further evolution. The Network Manager has achieved already some success in operational coordination, but it has been less effective in enforcement and in creating a more strategic partnership with stakeholders, in particular with ANSPs. In the baseline a lack of clarity remains as to what extent the Network Manager can become involved in ANSP and FAB planning. There are also concerns that FABs are developing their own flow management functions duplicating the central Network Manager functions. To avoid this, more effective authority has to be vested with the Network Manager. Finally, in line with its initial legal basis, a number of functions have been left outside the Network Manager, although they could benefit from common co-ordination at network level. This could mean that in the future some new SESAR related functions[61] would be orphaned and perhaps run sub-optimally in a duplicated environment.

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60 Regulation 550/2004 Art 9a

61 For example SESAR master plan reforms air traffic flow management by transforming it into time-based 4D trajectory management with tight tolerances. It also introduces a new type of information exchange network (SWIM). These types of services are most efficiently provided centrally due to their co-ordinative

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The above developments should provide some overall positive results. The performance scheme should continue to deliver a modest, but reasonably steady stream of improvements, particularly if we see modest traffic increases. However a return to the strong traffic growth of last decades[62] would quickly change that situation and expose the underlying capacity problems whilst the costs remain stubbornly high. Therefore the Commission should be prepared to consider further action to achieve progress that can not only improve the system at moderate growth levels, but also future-proofs it for a return to past growth rates.

2.4 SUBSIDIARITY

2.4.1 Legal basis

Articles 58, 90 and 100 of the Treaty extend to air transport the objectives of internal market in the context of a Common EU Transport Policy.

2.4.2 Necessity and EU added value

Actions by Member States alone cannot ensure the optimal building of capacity and safety, whilst assuring reductions in the cost levels of EU air traffic management services. The core idea of the SES – shifting airspace management from national level to the EU level to benefit from scale efficiencies and overcome the administrative and technical barriers created by the legacy of national approaches – predetermines the need of intervention at the EU level. Already in agreeing to the SES I and SES II packages, the Member States acknowledged that the continuing application of national rules and sub-optimal functioning of national institutions is in fact at the centre of the problem.

SES II+ initiative aims to ensure consistent implementation of the existing EU air traffic *acquis* and by so doing enable airspace users to benefit from a single consolidated legislative, operational and R&D framework and to face predictable business conditions throughout the EU. This should lead to creation of a Single European Sky and improve the competitiveness of European aviation sector.

3 OBJECTIVES

3.1 GENERAL OBJECTIVE

The 2011 White Paper for Transport emphasised the need to achieve a truly seamless Single European Sky by establishing the appropriate legal and financial framework to support it and by consolidating the relationship between the European Union and Eurocontrol, noting in addition that improving the efficiency of aircraft and traffic management should secure a competitive advantage on top of reducing emissions.

The general objective:
Improve the competitiveness of the European aviation system vis-á-vis other comparable regions, and in particular developing further the Single European Sky initiative, which implies de-fragmenting the European airspace,

or connecting natures, but they are not included in the current Network Manager scope. https://www.atmmasterplan.eu/

62 The 2011 White Paper on transport estimated that EU air transport activities could more than double by 2050.

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reducing delays, increasing safety standards and flight efficiency as to reduce the environmental footprint of aviation and the costs related to service provision.

The development of the Single European Sky (SES) initiative has included two comprehensive regulatory packages – SES I and SES II – and a number of related implementing rules. The purpose of this SES 2+ initiative is to fine tune and finalise some elements of the SES II package, but retain the same high-level policy objectives and choices as were agreed to by the Member States in 2009 and again stated in the 2011 communication[63]. SES 2+ also forms part of the SMA initiative striving to improve competitiveness and enhance growth in the internal market.

Stakeholders see a need for a single rulemaking and a common planning framework at the EU level, while eliminating any gaps and overlaps of the work in the different organisations.

Competitiveness of the European ATM system is important for the EU airlines. Although ATM forms only between 5-10% of the total cost-base of the airlines, the estimated existing inefficiencies in the current system are great enough to make for many airlines the difference of breaking back into profit from the current loss-making situation. Moreover the inefficiency of European ATM gives third-country airlines a competitive advantage over European airlines. Many of the biggest competitors of European airlines fly mostly in airspaces, where costs are lower and ATM service provision is more efficient, thus allowing them to operate in large part of their business with higher margins.

3.2 SPECIFIC OBJECTIVES

The general objective has been translated into specific and operational objectives attributed to the two problem areas: (a) insufficient efficiency of ANS provision and (b) a fragmented ATM system.

SO1: Improve performance of Air Traffic Services in terms of efficiency
SO2: Improve utilisation of air traffic management capacity

The efficiency of service provision and airspace use is seen as a relevant issue by stakeholders, especially by the ANSPs, the airlines, the airport operators and the manufacturing industries. Low relevance of this is mostly reported by trade unions and professional associations.

3.3 OPERATIONAL OBJECTIVES

The following operational objectives have been identified in order to address the problem drivers identified in the previous chapter:

OO1:	Ensure that the provision of Air Navigation Services is transparent, based on market principles and customer value.
OO2:	Strengthen the role of the National Supervisory Authorities
OO3:	Strengthen the process of setting up targets and enforcing the performance scheme (including the reinforcement of the Performance Review Body/Performance Review Unit (PRB/PRU)
OO4:	Strategic redirection of FABs

[63] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions COM(2011) 206/4

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OO5: Strengthen the governance and operational scope of the Network Manager

The operational objectives are more consistently supported by operators and manufacturing industry, while the views of NSAs, states and ANSPs are mixed. Improving the governance of the performance scheme is not perceived to be very relevant by a large share of these stakeholders. While almost all stakeholders consider it highly relevant that FABs focus increasingly on functionality and flexible search of synergies, most of them do not agree with the need of beefing up the functions of the Network Manager.

The specific and operational objectives are linked to the identified problems and drivers as follows:

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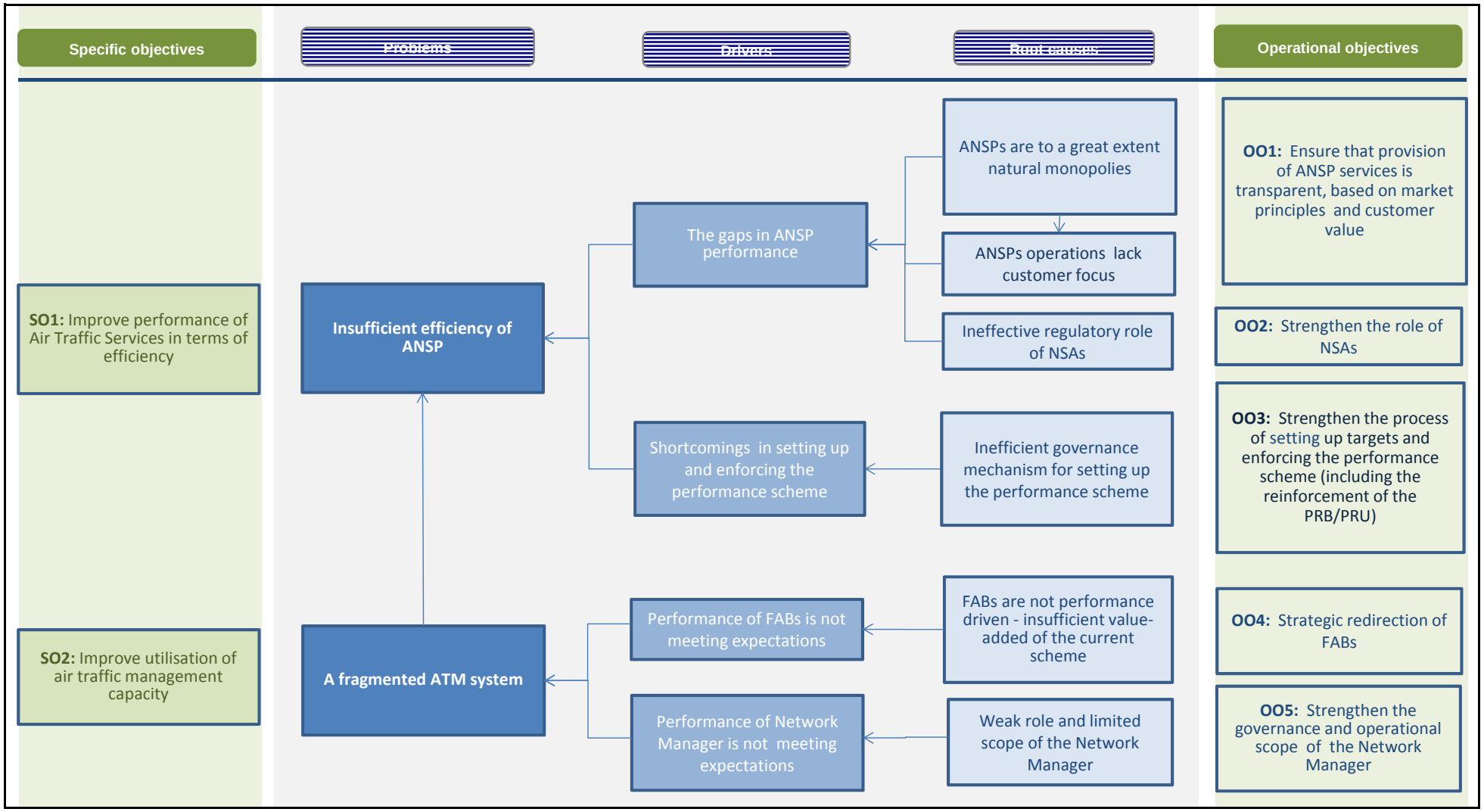
Figure 3-1: Problems, drivers, root causes and objectives



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3.4 COHERENCE WITH OTHER HORIZONTAL POLICIES

SES II+ aims to support meeting the objectives of the renewed policy agenda outlined in the Europe 2020 Strategy and the 2011 White Paper for Transport. Transport infrastructure is being considered as the backbone of the internal market and this objective has been retained as one of the "Twelve levers to boost growth and strengthen confidence" in the Single Market Act II, which was adopted by the Commission in October 2012.

4 POLICY OPTIONS

4.1 IDENTIFICATION OF POSSIBLE POLICY OPTIONS

The problem definition identified two main problem areas to be addressed to improve the performance of ANSPs in Europe – *efficiency of service provisions* and *fragmentation of ATM systems*. Chapter 2 above identified for problem are a series of drivers and root causes.

The analysis of the Commission and of the external consultants as well as the stakeholder consultation have helped to identify a broad set of measures in six policy domains having the potential to address all the problem drivers described above. The table below demonstrates the link between the root causes of the problems and different categories of options, while the content of each option is provided in the next chapter. In chapter 6 the analysis is taken a step forward by proposing and analysing the global policy scenarios combining options from all categories.

Figure 4-1: Overview table of root causes and corresponding options

Root cause to problem areas	Respective policy domains	Policy options considered
Problem Area 1: **Insufficient efficiency of Air Navigation Service provision**		
Integrated structures and lack of market mechanisms	1: Support services	**1.1** – Do nothing
		1.2 – Functional separation of support services
		1.3 – Structural separation of support services
ANSPs operations lack customer focus	2: Focusing ANSPs on customer needs	**2.1** – Do nothing.
		2.2 – Improved consultation and sign-off of some investment plans by airspace users.
		2.3 – 2.2 + giving the airspace users groups a stronger seat in the ANSP governance
Ineffective regulatory role of NSAs	3: Ineffective role of NSAs	**3.1** – Do nothing.
		3.2 – Introduce mutual co-operation and EU-level co-ordination and pooling of experts
		3.3 – 3.2+ institutional separation of NSAs from the ANSPs
Inefficient governance mechanism for setting up and enforcing the performance scheme	4: Performance scheme governance mechanism	**4.1** – Do nothing.
		4.2 – Reduced Member State involvement in the target setting process
		4.3 – Allow direct nomination of the PRB by Member States, but let the PRB set targets directly without comitology
Problem Area 2: **A fragmented ATM system**		
FABs are not performance driven, insufficient value added of the current setup	5: Refocusing of FABs	**5.1** – Do nothing
		5.2 – Create more prescriptive and enforceable targets/criteria for FABs
		5.3 – Creation of a more flexible and performance driven FAB-model
		5.4 – Top-down approach with a new entity created from the Network Manager to design service provision

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Root cause to problem areas	Respective policy domains	Policy options considered
Weak role of the Network Manager	6: The role of the network manager	**6.1** – Do nothing
		6.2 – Move operational governance to industry and simplify EU and State governance of strategic matters
		6.3 – Create a joint undertaking of the industry to operate the Network Manager
		6.4 – As option 6.2 or 6.3, but with a role for Eurocontrol built around the Network Manager and a more comprehensive centralised service provider and including also airspace design in broad sense

4.2 POLICY OPTIONS 1: SUPPORT SERVICES

Option 1.1 – Do nothing.

This option is to retain the existing arrangements, allowing the various ANS to be bundled into a single service provider, which under Articles 8 and 9 of Regulation 550/2004 can then be designated without application of normal public procurement rules, or any calls for tenders or related assessment of relative advantages. This option expects that any rationalisation will be driven by the performance scheme, the FABs and SESAR, but this will happen over an extended timeframe.

Option 1.2 – Functional separation of support services

This option requires ANSPs to organise the provision of support services internally in such a manner that they can be clearly distinguished as a single business unit. The separate business units must have separate accounts (i.e. their own balance sheets and profit/loss accounts), with cross functional charges clearly identified.

Option 1.3 – Structural separation of support services

In this option there is a structural separation of the support services from the core services. The assets and staff required for support service provision are transferred into a separate organisation which is independent from the core air traffic control (ATC) service provider. Resulting from this, the possibility for Member States to designate these support service providers is abolished as they can no longer be bundled together with the core service and only the core services can be designated. This makes the support services subject to European public procurement rules.

Stakeholder views: When it comes to introducing separation of support services from the core services and opening the market, the trade unions and professional associations are strongly opposed. On the other hand, the airlines fully support the idea, while the majority of the service providers agree to some extent[64]. Major political opposition could rise in certain States regarding the structural separation of support services as it also involves a considerable risk of industrial disturbances. On the other hand bilateral discussion have shown widespread support for the long term effects as structural separation enables a true market to be created and hence it creates maximal focus on cost of services and transparency of technical support costs as services are tendered through an open process.

[64] Annex IV, Figure IV-20

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4.3 POLICY OPTIONS 2: FOCUSING ANSPS ON CUSTOMER NEEDS

Option 2.1 – Do nothing.

As always, this option complies with the baseline scenario. Whilst certain amount of consultation of stakeholders would continue to take place under the current rules, there would be no clear requirement as to the extent and depth of that involvement.

Option 2.2 – Improved consultation and "sign-off" of some investment plans by airspace users.

This option seeks to improve consultation arrangements between ANSPs and airspace users by introducing a mechanism for airspace users to "sign-off" ANSP investment plans. The option has two features: (a) a "partnership model" which establishes the framework and content of a two-way consultation process and (b) an airspace user approval of major investment plans.

Option 2.3 – 2.2 + giving the airspace users groups a seat in the ANSP governance

This option builds on option 2.2 by adding to it the feature of a compulsory management/supervisory board seat for each of the three major airspace users (airlines, military aviation and general/business aviation). This could be conceived either as a non-voting or voting seat.

Stakeholder views: The vast majority of the service providers do not support the idea of making the detailed service providers business plans public. Airlines on the other hand fully agree with this. The service providers, trade unions and professional associations do not believe in involving all airspace users to the governance, in particular 90% of the service providers are against it[65]. Bilaterally it has also been indicated by some stakeholders that unless a co-ordination mechanism is created between the airspace users, there is a risk that the national airlines dominate the consultation process with a disadvantage to the smaller users and non-local airlines.

4.4 POLICY OPTIONS 3: INEFFECTIVE ROLE OF NSAS

Option 3.1 – Do nothing.

In this option the current problems with inadequacy of resources, expertise and independence would be allowed to continue and might even worsen if the tasks of the NSAs are increased under future implementing regulations.

Option 3.2 – Introduce mutual co-operation and EU-level co-ordination and pooling of experts

This option would focus on creating closer relations between the NSAs and encouraging co-operation and exchange of best practises through common forums under EASA auspices. EASA would also organise and facilitate a pool of national experts, where NSAs could source experts for less frequent tasks, as is already being built for other areas, such as air operations and airworthiness.

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65 Annex IV, Figure IV-21

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Option 3.3 – Option 3.2+ institutional separation of NSAs from the ANSPs

This option is as option 3.2, but with the addition of a requirement for full institutional separation instead of current functional separation of the NSAs from the ANSPs that they oversee. The intention is to increase further the level of independence and keep NSAs from using ANSP personnel for oversight and performance target setting.

Stakeholder views: Whereas a large number of stakeholders do not believe that supporting NSAs through a new EU-level regulatory agency or a non-EU organisation would be useful, the proposal for EU action to ensure a harmonised approach between NSAs received overwhelming support from the ANSPs, airlines, manufacturing industry, militaries and even to a considerable extent from the States ministries and NSAs. The unions and representative organisations were in opposition[66]. However there is still a certain political risk as the States that still have only functional separation may oppose any new measures. Furthermore the opposition of unions and representative organisations may lead to strikes, which further strengthens the cautiousness of the States in certain States.

4.5 POLICY OPTIONS 4: PERFORMANCE SCHEME GOVERNANCE MECHANISM

Option 4.1 – Do nothing

The performance scheme would continue to follow the current proposals for RP 2 and States – and through them the ANSPs– would continue to be able to diminish the ambition levels on targets. At the current rate reaching the high level SES objectives would become impossible by 2020.

Option 4.2 – Reduced Member State involvement in the target setting process

The process for setting targets would be shortened and the possibility for Member States influence would be reduced to favour technocratic input from the PRB. This would be mostly achieved by moving from the current implementing acts in comitology to delegated acts. The PRB would also be fully nominated by the Commission to ensure impartiality and allow expertise also from outside aviation to be introduced.

Option 4.3 – Allow direct nomination of the PRB by Member States, but let the PRB set targets directly without comitology

Traditionally the performance scheme has depended on the EU function of a PRB for independence and expertise and on comitology for mitigating that technocratic view with political input. This option would turn the setting upside-down by allowing the Member States to nominate the PRB members under strict criteria for independence. This criterion would for example forbid entry into ANSP service immediately after the term in the PRB in a similar manner as is determined for the board of the European Central Bank. On the other hand the comitology process would be entirely eliminated to ensure swift and undiluted target setting process.

Stakeholder views: A quarter of the respondents to the public consultation (including airlines) agree and about a third agree to some extent that the timescale of the current target-setting process is being problematic for implementation. As regards the idea of giving the PRB a more independent role, the stakeholders have a mixed opinions – a quarter of the respondents agree

[66] Annex IV, Figures IV-22 and IV-17

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(including half of the ANSPs, which would be the target of the tighter scheme), while a third (mostly trade unions) believe this should not happen at all[67]. Bilateral contacts have indicated that there exists a risk of political opposition regarding reduced Member State involvement in the target setting process if States see this option more as a landgrab than a genuine attempt to improve the performance system.

4.6 POLICY OPTIONS 5: REFOCUSING OF FABS

Option 5.1 – Do nothing

The do nothing option would continue the current slow progress in creation of FABs and continue to treat FABs as static structures. Whilst RP2 will include targets at FAB level, they will still de facto be implemented with a split along the national lines.

Option 5.2 – Create more prescriptive and enforceable targets/criteria for FABs

The current list of FAB criteria in Article 9a of Regulation 550/2004 is problematic in two senses. Firstly, the criteria and timeframes for FABs are too generic and do not enable flexible alliances and secondly, there is no approval required from the Commission so that there is no quality check on a FAB before establishment. The current criteria do not drive specifically performance, but more the establishment process of a formal structure. This option would replace these criteria by creating more measurable and performance based permanent criteria/targets (in addition to the targets in the performance scheme) for FABs to comply with before they can be approved as fully operational.

Option 5.3 – Creation of a more flexible and performance driven FAB-model

This option would focus the FABs on being tools for achievement of the performance scheme targets. Airspace design would be increasingly moved to the level of the Network Manager (i.e. level above FABs), whereas the FABs themselves would focus on finding the optimal alliances for each part of the services being provided. In a sense this could mean "variable geometry FABs" as long as the performance targets are attained.

Option 5.4 – Top-down approach with a new entity created from the Network Manager to design service provision

Traditionally SES has relied on the industry (ANSPs in this case) providing the right decisions and combinations to improve performance as long as certain environmental constraints were covered by the SES rules. In this model we would go the opposite way by creating a central planning entity from the Network Manager, PRB and EASA and asking it to redesign EU airspace based on 4-6 major concession blocks. A tendering process would then be held amongst the ANSPs to choose companies to run the services during a 10-15 year period.

Stakeholder views: Around third of the respondents (the service providers, the ministries and the NSAs) agreed to some extent, that there is a need for introducing a clearer and simpler performance oriented criteria for FABs, together with a simpler and more efficient enforcement mechanism, while the firmest opponents are most of the trade unions and 40% of the professional associations respondents. As regards the introduction of different forms of FAB industry led cooperation, like flexible alliances and cross-border mergers, the service providers

[67] Annex IV, Figures IV-11, IV-23 and VI-24

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and most of the airlines fully agree, while the trade unions and professional associations are opposed. About third of the respondents do not have opinion on this[68].

4.7 POLICY OPTIONS 6: THE ROLE OF THE NETWORK MANAGER

Option 6.1 – Do nothing

The do nothing would continue to develop the Network Manager based on current legal scope and functions. It would continue to focus on the initial subset of possible functions and any new SESAR based functions would need to be covered by other means, such as through initiatives taken by existing individual ANSPs. Governance would remain dominated by a States and comitology process.

Option 6.2 – Move operational governance to industry and simplify EU and State governance of strategic matters

The Network Managers scope would stay the same as today, but a two-level governance system would be created: (a) all operational matters would be decided in an operations board manned by industry and (b) strategic matters (approval of the Network Strategy Plan, the Performance Plan and budget) would remain in the Network Management Board, though with a strengthened industry role. Member States would still retain a veto right for matters relevant to national sovereignty

Option 6.3 – Create a joint undertaking of the industry to operate the Network Manager

In this option the Network Manager would no longer be run as an intergovernmental organisation, because of the mismatch between such a structure and a tasking as a service provision organisation. Instead it would involve the Network Manager becoming an Industry Joint Undertaking, with participation by the industry in its widest sense, including airspace users and operators, and with appropriate distance to the supplier industry to avoid conflicts of interest. The Network Manager JU could be operated under the same concept as the SESAR JU.

Option 6.4 – As option 6.2 or 6.3, but with a role for Eurocontrol built around the Network Manager and a more comprehensive centralised service provider and including also airspace design in broad sense

This option also requires a governance reform to improve industry's role as described in either option 6.2 or 6.3 since the organisation would be ever more clearly a network-level service provider and the link to the ANSPs and airspace users it serves should be correspondingly strong. A key feature of this option is the concept of centralised services in which certain upcoming data driven ATM services would be rationalised through the provision of these services at network level, including operational tendering to industry. In discussion with Eurocontrol, up to ten centralised services have been considered to be established by the Network Manager in the period 2013-2017. The idea is to avoid multiplication and lower in particular the cost of SESAR deployment, which introduces numerous new technologies and requires rationalised deployment. In the past the ATM system has become fragmented and overlapping as each ANSP implemented system changes separately, but SESAR allows for rebuilding from a clean – rationalised- sheet. So far 8 candidate services have been identified, with 2 more being studied: Airport slot/flight plan correlation; 4D trajectory planning; Military

[68] Annex IV, Figures VI-25, IV-14, IV-13 and IV-7

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airspace reservation booking; Digital flight briefing (expanded EAD); Centralised surveillance tracker service; Management of scarce resources; RVSM height monitoring stations; and an Integrated ground communications service (PENS).

Most airspace users and even ANSPs would agree to giving the airspace users a more important role in strategic matters, whilst the States were more reserved and other stakeholder groups for most part had no opinion. As concerns the inclusion of the new functions under the Network Manager, most airspace users and ANSPs supported at least some extension, whereas quite interestingly most of the States and other stakeholder groups had no opinion on the matter. This seems to reflect the fact that Network Manager operations are increasingly considered to be a service provision or at least a "support to service provision" function and only the stakeholder directly interacting with it have views about its role[69].

5 ASSESSMENT OF IMPACTS

5.1 INTRODUCTION AND GENERAL METHODOLOGICAL APPROACH

This chapter details the impact assessment of different options[70]. Given the strong focus on cost-efficiency, the main impacts of this initiative are economic and social, whilst the environmental and noise related health impacts are mostly indirect and driven by gains in flight path efficiencies. The impacts are quantified wherever possible, but it has to be noted that a number of options concern aspects such as administrative or governance efficiency, where all elements of changes cannot be quantified. In addition the precise impact of e.g. improved performance target setting depends on a variety of external factors – in particular the negotiating and bargaining skills of various participants – so impacts are presented as ranges of estimates instead of definite and precise numbers.

The impact assessment will, at the first stage, assess and compare the options in each policy domain with the aim to establish the (1 or 2) best performing options. At the second stage the retained options are put together into policy scenarios, which will be assessed and compared against each other and the full baseline scenario.

At the first stage the assessment focuses mostly on direct impacts, such as administration costs, (ANS) cost efficiency, flight efficiency and capacity[71]. Also the impacts of each option on employment, working conditions and safety are considered. Environmental impacts are, if relevant, also assessed. At the second stage, the analysis of the policy scenarios will (a) eliminate overlaps (b) take account of synergies and (c) consider also indirect impacts, including macroeconomic impacts of each policy scenario and expected environmental benefits.

The full assessment (including additional examples and evidence and background calculations) of the various options is shown in Annex V, with a synopsis below in this chapter.

The assessment is based on:

- Interviews with key stakeholders

69 Annex IV, Figures IV-26 and IV-19

70 Analysis of impacts is to an extent based on the work of the consultant. For full details, see the IA support study, especially its chapters 5-7 [add link after publication]

71 Definition of these costs is provided in chapter 1 of Annex V

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- The electronic survey among stakeholders carried out by the Commission
- Literature review
- PRB monitoring results, studies and discussions with PRB on specific issues.
- A dedicated consultant's study on SES II+
- E3ME macro-economic model run.

5.2 SUPPORT SERVICES[72]

5.2.1 Assessment of impacts

Based on the analysis below and in Annex V, the pros, cons and associated risks of the options can be summarised as follows:

Figure 5-1: Pros, cons and risks of options on support services

	Option 1.1 Do nothing	Option 1.2 Functional separation of support services	Option 1.3 Structural separation of support services
Pros	• Politically acceptable to States. • Avoids dislocation associated with unbundling. • No additional admin costs.	• Relatively simple and politically acceptable • Provides transparency on the cost of support services. • Avoids dislocation associated with unbundling.	• Enables a true market situation to be created, with the associated efficiencies. • Eases the arrival of new entrants • Promotes technical development and innovation • Would ease search for synergies at the level of FABs.
Cons	• Perpetuate the current efficiency problems. • Resistance to technological changes. • Barrier for developing FABs	• Requires additional dimension in financial reporting and performance monitoring systems. • Requires shift towards market principles in management and organisational culture.	• One-off effort and cost of the creation of new entities. • Requires mechanisms to ensure continuity and quality of outsourced services • Requires adoption to market principles in management and organisational culture • Requires additional effort and know-how on contracting • Possible complexity in sharing infrastructure
Risks		• May lead to current situation being perpetuated with just additional cost • Moderate risk of strikes and disruptions to traffic.	• Major political opposition in certain States • Trade unions strongly opposed • Considerable risk of strikes and disruptions to traffic

5.2.1.1 Economic impacts

Cost efficiency: Options 1.1 *do nothing* and 1.2 *functional separation of support services* are not likely to bring major benefits. In fact option 1.1 would act also as an inhibitor to FAB development as it would fully retain the big static ANSP's and be least likely to lead to flexible service provision or search of synergies. Functional separation would bring greater clarity over expenditure and help identify opportunities to improve service. However, this effect is uncertain and would to some extent be negated by the need to add complexity to financial management and reduce multi-tasking of personnel. On the other hand, based on experience

[72] For a full description of the assessment of options in all policy areas, see Annex V. Due to space constraints, only conclusions are presented in the main text

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from other infrastructure industries and from the known cases of ATM unbundling (see Box 5-1), option 1.3 *organisational separation of support services* could, according to even a conservative estimate, brings cost savings of 20% on the support services provision[73]. This estimate is considered conservative, because the estimate from the LVF company was that they have saved up to 50% in costs, but it is evident that such savings cannot be realised overnight due to the cost of organisational change and also that the savings themselves will depend on the current efficiency of each provider. Hence only 20% is assumed as benefit and even that would amount to some € 450 million in cost savings per annum[74], comparable to 5.4% of the total € 8.3 billion annual ANS costs in 2011. It is actually possible that higher benefits will be reached over time once the market has matured, but be on the safe side, for now only 20% benefit is assumed.

Box 5-1: Examples of efficiency gains achieved via market based support services

ANSP sector

- The Swedish ANSP; LFV, outsources systems maintenance of communication navigation and surveillance equipment to ELTEL Ltd since 36 years. According to PRU cost efficiency benchmarking data (ACE 2010), LFV's technical support staff is approximately 9% of total staff, compared to ~22% for Europe on average. Cost efficiency has improved, while the quality of service is high. Based on the LFV study "Maintenance Cost Effectiveness", outsourcing was estimated be about 50% more cost efficient than arranging this service in-house.
- HIAL manages 11 airports in the north of Scotland. It outsources its aerodrome engineering, requiring a small number of engineers supporting 24/7 operations. The engineers are contracted through the UK NATS. Overall HIAL's experience of outsourced services is positive, but it emphasised the importance of well-defined service contracts and the need to manage risks. Their experience is that they have been able to achieve lower costs and meet defined levels of service. The spread between the lowest and highest offers has been ~25%.

Experience form rail sector:

- Introduction of competitive tendering has resulted in savings of 20% to 30% for Public Service Contracts in Germany, Sweden and Netherlands[75.]

Flight Efficiency: This policy area is focused on cost efficiency and will not affect flight efficiency.

Capacity: No impact is likely in any of the options, assuming that proposed changes in governance mechanisms would not affect the quality of support services. Assurance for the latter is provided by the fact that legal requirements and oversight arrangements would remain unchanged.

Administration costs: Option 1.2 *functional separation* would bring to **ANSPs** additional costs as the creation of separate business units would result in some adjustments in the information systems and additional overhead staff costs (new administrative layer). However, this cost would not be significant. In option 1.3 *organisational separation* there will be one-off settlement costs, as the support services would need to be structurally separated into different entities. In addition, a requirement to subject all support services to public procurement rules would require the ANSPs to define specifications for services, the conditions for their

73 Conservative estimate based on experiences from similar unbundling cases both in ATM (e.g. LFV or HIAL Ltd) or other infrastructure industries such as energy or rail sectors. See box 5-1 and Annex V.

74 Total ANS costs amount to € 8.3 billion in 2011, according to PRR 2011, of which 27% is taken up by support service costs (source: PRU). A reduction of 20% of these costs is around € 450 million.

75 Commission IA on the opening of the market for domestic passenger transport services by rail, p. 30.

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provision, and the rules for non-compliance or non-performance, etc. and hire competent staff for that purpose. It is expected that on average, each of the 27 main ANSPs would have to hire at least 1 additional procurement expert.[76]. Therefore, as a result of this option, the administration costs in ANSPs are expected to increase by about € 4.5 million per year.

NSAs could face additional costs as regards certification of new service providers, that especially in case of option 1.3 *operational separation*. Over the time however, it is likely that (cross-border) consolidation of support services will reduce the number of providers and consequently also oversight costs.

5.2.1.2 Social impacts

Impacts on employment and working conditions: Certain impact on employment and working conditions is already embedded into the baseline option. SESAR deployment implies that in ANS provision is moving from traditional ground infrastructure to satellite based systems, automated weather observation and modernised information management resulting in reduction in staff needs. On top of that baseline the employment related impacts of option 1.2 *functional separation* will be minimal as staff will remain in the same organisation and perform the same tasks as before. There may be marginal additional employment in ANSPs given that a new layer of management needs to be created. In option 1.3 *organisational separation* the situation is different as new service providers will be created and staff will mostly move into these entities. In addition, competition will exert a pressure on staff numbers and working conditions in the search of efficiencies. Separation is also expected to accelerate innovation and technological change as compared to the baseline. Therefore it is expected that during the creation phase of these new providers of support services some redundancies will be seen. Based on the evidence gathered from privatised service providers, it may be assumed that overall employment would decrease by roughly 10% over a decade[77], whilst the trend in the ANSP's over the last decade (i.e. baseline) has been 5%. Hence the additional decrease would be about 0.5% per year, but with considerable variation depending on the service and with an emphasis on the first years of operation.

Safety: No impact is foreseen as the requirements on safety management systems and the oversight arrangements will remain the same in all options. Providers of outsourced services have to be certified by NSAs. Furthermore it is important to define precise service conditions to ensure high quality and continuity of services.

5.2.1.3 Environmental impacts

Given that policy measures under this category of options have no effects on flight efficiency, there will be no direct environmental impacts.

5.2.2 Comparison of options

The table below summarises the assessment of impacts and provides the comparison of each option to the baseline in terms of effectiveness and efficiency. Coherence will be assessed at the level of different policy scenarios in chapter 6.

[76] The average European costs of staff at ANSPs is approximately € 162 000 a year (costs for supervision in France and Germany for 2011, corrected for overheads and adjusted to EU 27 averages based on GDP per capita expressed in PPP)

[77] For further details, see discussion on social impact of Option 1.3 at the end of part 2 of Annex V.

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Any comparison table in this report compares the relative impacts within a row, but not the relative importance of different rows.

Key to the scores applied:

--- -	decreasingly negative
0	neutral
+ … +++	increasingly positive

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Figure 5-2: Comparison of options on support services

	Option 1.1 Do nothing	Option 1.2 Functional separation of support services	Option 1.3 Structural separation of support services
SUMMARY OF IMPACTS			
Economic impacts:			
Cost efficiency	0	+	++ ~€ 450 M p.a.
Flight efficiency	0	0	0
Capacity/Delays	0	0	0
Administration costs	0	-	-- One-off restructuring costs plus ~€ - 4.5 M p.a.
Social impacts:			
Employment and working conditions :			
NSAs	0	0	0
ANSPs	0	0	-- ~ - 300 jobs p.a.
Safety	0	0	0
Environmental impacts:	0	0	0
EFFECTIVENESS/EFFICIENCY			
Effectiveness:			
Specific objectives:			
SO1: Improve performance of ATS in terms of efficiency	0	+	++
SO2: Improve utilisation of ATM capacity	0	0	0
Operational objectives:			
OO1: Ensure that the provision of Air Navigation Services is transparent, based on market principles and customer value.	0	+	++
Efficiency			
	0	0	++ (benefits € 450 M p.a. costs € 4.5 M p.a.)

Option 1.2 brings some very limited benefits, mainly in terms of transparency of costs related to support services, but these could be overshadowed by the increase in cost and complexity at the administrative side. There is no guarantee that improved transparency would effectively result in increased autonomy and performance improvement. Option 1.3 is more likely to encourage competition (and possibly also consolidation) of ANS and thereby drive down the service costs for air operators. However efficiency gains could result in more demanding working conditions and perhaps reduced employment in the ANSPs. Overall, the decrease in employment could be compensated by the growth in general economy, as discussed in chapter 6. Hence option 1.3 is the most performance optimised option, whilst option 1.2 has a potential to bring some incremental improvements in performance with lesser risk of redundancies and distress among the employees of ANSPs.

5.3 FOCUSING ANSPS ON CUSTOMER NEEDS

5.3.1 Assessment of impacts

The pros, cons and associated risks of the options on focusing ANSPs on customer needs have been assessed to be as follows:

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Figure 5-3: Pros, cons and risks of options on focusing ANSPs on customer needs

	Option 2.1 Do nothing	Option 2.2 Improved consultation and sign-off of investment plans	Option 2.3 Option 2.2+airspace users having seat in the ANSP governance
Pros	• No additional bureaucracy • Possibility to push effectiveness of consultation by using soft measures	• Clarifies consultation process • Provides better alignment of ANSP plans with users' needs • More responsive to down-turns in traffic • Pushed innovation, services of little value discontinued	*Same as for option 2.2 plus:* • Physical presence enables to develop shared objectives • Further transparency by full access to documents.
Cons	• No additional involvement of airspace users • Consultation continues to be a "one-way street"	• Time and resource consuming for both ANSPs and airspace users • Individual and/or short-term focus could prevail network-level strategic views • Need for a mechanism allowing to maintain balance between performance and safety needs	*Same as for option 2.2 plus:* • Limited number of seats creates issues with providing balanced representation of different user groups • Airspace users may lack resources and skills necessary for participation • Even higher risk of "short-terminism" than in Option 2.3
Risks		• Effectiveness of a partnership approach is dependent on attitude. • Risk that the larger national airlines dominate the process • Need to share confidential business info may create issues	*Same as for option 2.2 plus:* • Moderate support from states • String opposition from ANSPs and trade unions

5.3.1.1 Economic impacts

Cost efficiency: Both option 2.2 *improved consultation and sign-off* as well as option 2.3 *governance board* would have positive impacts. Together with the approval of major investment plans, consultation (like provided by option 2.2) is expected to have a moderate impact on cost-efficiency, but the exact size of the impacts depends greatly on local variables and the economic cycle – e.g. costs being prioritised during economic downturns, whereas capacity concerns prevail in boom times. In case of option 2.3 the direct involvement of user representatives in decision making at the ANSP board would further strengthen the influence of airspace users. In both cases the impact may to some extent be balanced by the fact that all three airspace users groups (airlines, military, general aviation) could have their different priorities.

Flight Efficiency: Both non-baseline options would have a positive effect on flight efficiency as airspace users influence ANSPs to further improve routes and implement new technologies. As with cost efficiency, the impact is greater for option 2.3.

Capacity: The impact would be similar to the one on cost efficiency and flight efficiency. As explained above, capacity issues may get more impetus during the times of growth. This would raise an issue for both non-baseline options in the sense that ANSPs are infrastructure industries and need to plan infrastructure with a 20-30 year horizon, whereas the airlines tend to react to short and medium-term changes in the economic cycle. Hence additional airspace user involvement in the ANSP governance, as foreseen under option 2.3, could compromise strategic investment (including SESAR) during economic hardships.

Administration costs: Both options 2.2 *improved consultation and sign-off* as well as 2.3 *governance board* would require some additional administrative effort from both the ANSPs and the airspace users. Based on experience from the airport charges consultation

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process, ANSPs would need to devote roughly 1.5 FTE in additional resources for preparing consultation documents and meetings. Airspace users would need to devote roughly 1 FTE to the work in assessing the proposals. This in total would imply an overall increase in administration costs of € 15 million[78]. In option 2.3 *governance board* there would be a small additional effort for the participation in board meetings and decisions. Since the arrangements would in all cases be between the ANSPs and the airspace users, there will be no administration costs for States (NSAs) or EU.

Box 5-2: Examples of existing airspace users' involvement practices

- As an interim measure until SES has had a chance to improve the situation, IATA has encouraged ANSPs and the users to establish partnership agreements – referred to as Performance Partnership Agreements (PPAs) - which establish a framework for the consultation process and its content.
- In the UK context the discussions ahead of setting the Control Period 3 formula, NATS (NERL) and its users have undertaken a process of discussions, whereby they are seeking to agree between each other the key assumptions that will underpin the decision for the NATS price control. This followed a similar framework to the "Constructive Engagement process" between the airport operator BAA and its users, which is modelled on the approach taken at airports in Australia.
- Most advanced example exists in New Zealand, where in addition to continuous consultation additional motivation is created with profit sharing arrangements between ANSP and airlines. Major investment plans are approved by users who have to ultimately pay for them and the users face also binding commitments to use the investments – i.e. equip aircraft with new technology or fly new routes.
- The Canadian ANSP, NavCanada is a special purpose non-profit entity managed by a stakeholder board. There is a general argument that although NavCanada is a monopoly, it requires little performance oversight as stakeholders are already represented at the Board level and monitor performance. User charges have not gone up for 8 years, making charges around 25% lower in real terms. Costs have been reduced by efficiency measures and staff reductions

5.3.1.2 Social impacts

Impacts on employment and working conditions: Impacts of option 2.2 *improved consultation and sign-off* would depend on the amount and type of efficiency measures, or introduction of new technologies and procedures that would be pushed through by the users. As implementation of new concepts would become easier, employment might reduce slightly due to e.g. increased automation. This would affect most the administrative support staff. Furthermore, the introduction of new technologies could change the content of work and require re-fitting of skills. In option 2.3 *governance board* this effect could be marginally more pronounced as the influence of airspace users would be stronger. However the exact magnitude of these changes will depend very much on the ANSP in question as well as external variables, such as overall economic development.

Safety: No safety impact is expected in any of these options as the airspace users and ANSPs have the same safety objectives. The airspace users would be keen to retain high safety levels even where the cost-drive puts pressure on the ANSP to deliver services cheaper.

5.3.1.3 Environmental impacts

Any improvement in flight efficiency or reduction of "engine-on" delays will proportionally reduce emissions.

[78] Average European costs of staff at ANSPs as calculated above calculated for 1,5 FTE per one ANSP and 1 FTE at airspace user side, calculated for 37 ANSPs and 37 airspace users

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5.3.2 Comparison of options

Economic, social and environmental impacts of this group of options, along with their efficiency/effectiveness are scored in the next table.

Figure 5-4: Comparison of options on focusing ANSPs on customer needs

	Option 2.1 Do nothing	Option 2.2 Improved consultation and sign-off of investment plans	Option 2.3 Option 2.2+airspace users having seat in the ANSP governance
SUMMARY OF IMPACTS			
Economic impacts:			
Cost efficiency	0	+	+(+) long term possibly -
Flight efficiency	0	+	+(+) long term possibly -
Capacity/Delays	0	+	+(+) long term possibly -
Administration costs	0	- ~- € 15 M p.a.	- >~- € 15 M p.a.
Social impacts:			
Employment and working conditions :			
NSAs	0	0	0
ANSPs	0	-	- (-)
Safety	0	+	+
Environmental impacts:	0	+	+ (+) long term possibly -
Effectiveness:			
Specific objectives:			
SO1: Improve performance of ATS in terms of efficiency	0	+	+ (+) long term possibly -
SO2: Improve utilisation of ATM capacity	0	+	+(+) long term possibly -
Operational objectives:			
OO1: Ensure that the provision of Air Navigation Services is transparent, based on market principles and customer value.	0	+	+(+)
Efficiency			
	0	+*	+(+) Long term possibly -
* For this option benefits are not quantified as they depend on too many factors, but it could be said that due to the cost and magnitude of aircraft operations, already the optimisation of approach and departure procedures at a single medium-sized airport (e.g. 150000 operations p.a.), would be sufficient to cover additional administration costs. Typically one "continuous descent approach" saves ~300kg of fuel and a suboptimal departure sequence may burn an additional 500-800kg of fuel per flight so the potential benefits are considerable.			

Both options 2.2 *improved consultation and sign-off* as well as option 2.3 *governance board* would have a positive impact on overall efficiency and capacity, but some negative impacts on employment condition inside the ANSPs. Whilst the effect in option 2.3 is bigger, the differences between options 2.2 and 2.3 are relatively small in terms of benefits. Option 2.3 carries higher risks, as it would be politically more difficult to implement and could result in lesser support for implementation of long-term investments and SESAR deployment. Therefore option 2.2 seems to be balancing best the short and long term costs and benefits.

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5.4 INEFFECTIVE ROLE OF NSAS

5.4.1 Assessment of impacts

Based on the analysis below and in Annex V, the pros, cons and associated risks of the options can be summarised as follows:

Figure 5-5: Pros, cons and risks of options on ineffective role of NSAs

	Option 3.1 Do nothing	Option 3.2 Mutual Co-operation, EU coordination and pooling of experts	Option 3.3 Option 3.2+institutional separation of NSAs from ANSPs
Pros	• Low-cost, minimum effort for States on the short term • Convenient for States that only want functional separation • Some improvement foreseen in baseline	• Addresses staff shortages in an efficient way and levels expertise • Strengthens cross-border (FAB) oversight	*Same as for option 3.2 plus:* • Assurance of autonomous NSA operation • Commonly agreed basis for definition of independence • Challenging ANSP towards better performance and safety.
Cons	• Inadequate resourcing of NSAs (manpower and skills) • Sub-optimal functioning of the performance scheme • No enforcement of cross-border and FAB level oversight.	• Potential legal barriers and funding arrangements that need to be addressed • Language issues • EASA remit does not address all aspects of performance scheme.	*Same as for option 3.2 plus:* • Yet another change to NSA scope while most of them are not yet on full speed • The best (seconded) staff may go back to ANSP[79]
Risks	• Conflict of interest in administering the performance scheme continues	• Possible conflict of interest in EASA providing support and performing inspections at the same time • Potential "forum fatigue" - already too many committees and organisations exists.	*Same as for option 3.2 plus:* • Major political opposition in some States still having only functional separation – though others have noted that they would welcome the pressure to change.

5.4.1.1 Economic impacts

Cost efficiency: Both option 3.2 *mutual co-operation and expert pooling* as well as option 3.3, adding to 3.2 *institutional separation*, are estimated to improve cost efficiency. The performance scheme hinges on the national authorities being independent and expert enough to assess their ANSPs performance and to set realistic, but ambitious targets. Hence the strengthened expertise, as provided by option 3.2, is expected to have a positive effect, although this is difficult to quantify. It would be a conservative assumption to estimate that the gains form this option would at most be 50% of the efficiency savings achieved by option 3.3. Even if improved availability of expertise and skills (as foreseen by Option 3.2) would allow the authorities to better identify problems, there should be a strong willingness and independence of decision making in place (as foreseen by Option 3.3) to ensure effective actions to rectify the matter. In the latter option, improved expertise will be supported with true independence of NSA from the ANSPs. It is estimated to increase the robustness of the performance scheme in a comparable manner to the more ambitious performance scheme options i.e. some € 150 million per annum (see section 5.5 below).

Flight Efficiency: As for cost efficiency, the positive effects get magnified with greater NSA expertise and independence. While option 3.2 *mutual co-operation and expert pooling* would have only a limited effect rising from better resourcing, 3.3 *institutional separation* will be more beneficial due to the accompanying effect on NSA independence.

[79] In most States the ANSP pay levels are higher than at the authority

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Capacity: Similar impact as for cost efficiency and flight efficiency.

Administration costs: It is not expected that any of the options would have impact on **ANSPs** administration costs. Regarding the administration costs in **NSAs,** option 3.2 *mutual co-operation and expert pooling* is expected to save some € 6.5 million as compared to the baseline[80], whereas in option 3.3 which *adds* to option 3.2 *institutional separation*, there will be approximately € 2 million increase in administration costs compared to the baseline[81] due to the need to create independent NSAs in (a) the four States that still utilise only functional separation and (b) the four States that have a minor NSA that is functionally separated[82]. Relevant calculations can be found in chapter 4 of Annex V.

Expert pooling would need a coordination mechanism at **EU level**, but for that purpose resources should be found by an internal redistribution of functions in EASA.

Box 5-3: Approach to separation in Member States

Separation between ANSPs and NSAs is necessary to ensure effective supervision and avoid conflicts of interest. Criteria for effective separation may be summarised to include:

- Separate legal personality or organisational structure to ensure independent and authority to take appropriate action in cases of non-compliance;
- Separate reporting lines in the NSA and authority (except possibly at the political level, where both may answer to the same minister – typically minister for transport).
- Funding and staffing arrangements which do not hamper or in any way restrict the NSA in performing its duties, and ensure independence from pressure from the ANSP;
- Leadership and budget of the NSA to be set by the State's Parliament or similarly independent entity.
- Separate public identity, including publicity and communications arrangements;
- Visible empowerment from the national governing body (Parliament, Ministry);
- Stringent requirements on individuals for independence.

The institutional situation of NSAs in States is mixed. Eight of the 32 NSAs referenced in the SES implementation report[83] reported that they have at least one functionally separated NSA[84] from their service-provision counterparts, while the remaining NSAs have reported more complete separation (institutional/organisational). Institutional separation is considered being most effective, given that compliance with the separation criteria is built into the institutional structure.

5.4.1.2 Social impacts

Impacts on employment and working conditions: Compared to the baseline, option 3.2 *mutual co-operation and expert pooling* would create a group of highly qualified experts, whose job description would change and who would be regularly dispatched to different NSAs to support them in specific projects. Option 3.3, which adds *institutional separation*, would additionally lead to the recruitment of approximately 80 new administrators to run the newly

80 See annex V, pages 135-8

81 i.e. a net €4.5 million saving as the €6.5 Million saving from option 3.2 would still take place

82 According to the 2011 SES implementation report (published June 2012), there are a total of 37 NSAs in the 29 SES States. A Number of States have a separate NSA for example to oversee meteorological services. In four States the main NSA is functionally separated and in four other States the main NSA is fully separated, but either Met or AIS NSA is functionally separated. There are also a total of 28 fully separated NSAs in 29 SES States

83 www.eurocontrol.int/sites/default/files/content/documents/official-documents/reports/2012-sesreport2011.pdf (see Annex 2)

84 Entirely functional separation exists in Cyprus, Greece, France and Ireland, whilst Portugal (MET), Netherlands (MET), Spain (Military) and Denmark (AIS) have a small part of the oversight with only functional separation, whilst the majority is institutionally separated

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independent NSAs. This would favour experienced staff from the ANSPs and give some balance to the reductions in ANSP staff numbers arising from performance improvement measures.

Safety: There is a well-documented link between oversight quality and safety levels, so any increase in NSA quality and efficiency should improve safety levels. Option 3.3 compared to option 3.2 would have a positive impact advancement, given that an independent authority is more likely to interfere in safety matters.

5.4.1.3 Environmental impacts

Any improvement in flight efficiency may result in corresponding reduction in emissions. On average the routes flown in 2011 were 4.6% longer than the shortest distance because of ATM restrictions and each 0.1% improvement in that extension reduces fuel burn by 30 000 tons, which translates to 92 000 tonnes of CO_2 as well as a proportionate reduction in NOx and particulate matter.

5.4.2 Comparison of options

Economic, social and environmental impacts of this group of options, along with their efficiency/effectiveness are compared in the table below.

Figure 5-6: Comparison of options on ineffective role of NSAs

	Option 3.1 Do nothing	Option 3.2 Mutual Co-operation, EU coordination and pooling of experts	Option 3.3 Option 3.2+institutional separation of NSAs from ANSPs
SUMMARY OF IMPACTS			
Economic impacts:			
Cost efficiency	0	+ Max ~€ 75 M p.a.	++ ~€ 150 M p.a.
Flight efficiency	0	+	+
Capacity/Delays	0	+	++
Administration savings	0	++ ~€ +6.5 M p.a.	+ ~€+ 4.5 M p.a.[85]
Social impacts:			
Employment and working conditions :			
NSAs	0	0	+ ~ +80
ANSPs	0	0	0
Safety	0	+	++
Environmental impacts:	0	0	0
EFFECTIVENESS/EFFICIENCY			
Effectiveness:			
Specific objectives:			
SO1: Improve performance of ATS in terms of efficiency	0	+	++
SO2: Improve utilisation of ATM capacity	0	+	++
Operational objectives:			
OO2: Strengthen the role of NSAs	0	+	++
Efficiency			
	0	+ annual savings <€ 82 M	++ annual savings ~€ 155 M

[85] ~€ 6.5 M p.a. - ~€ 2 M p.a.= ~€ 4.5 M p.a.

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Benefits of option 3.2 *mutual co-operation and expert pooling* are significant, while its risks are mostly of an operational nature. Option 3.3, which adds to option 3.2 *institutional separation* of NSAs, is expected to double the benefits, however it carries high political risks. Still option 3.3 seems to emerge as the preferred option.

5.5 PERFORMANCE SCHEME GOVERNANCE MECHANISM

5.5.1 Assessment of impacts

The pros, cons and associated risks of the options on the performance scheme governance mechanism as assessed below and in annex V are summarised in the table below.

Figure 5-7: Pros, cons and risks of options on the performance scheme governance mechanism

	Option 4.1 Do nothing	Option 4.2 Reduced Member State involvement in the target setting process	Option 4.3 Direct nomination of the PRB by Member States, PRB sets targets directly without comitology
Pros	• Least political opposition • Possibility to apply lessons learnt from RP1	• States are further away from the target setting process. • Building capability of the PRB to make independent and broad expert judgements • Commission nominated members reduce risk of regulatory capture • Creates transparency of ANSPs investments allowing enhance SESAR deployment	*Same as for option 4.2 plus:* • Higher States' trust as regards PRB members and their expertise • Skipping comitology part would speed up process
Cons	• Conflict of interest continues to impact target setting, performance plan assessment and objectivity of analysis of past performance. • Slower rate in achieving performance improvements to EU network. • Airspace users have an increased feeling of lack of effective control of ANSPs.	• May lose the influence of those Member States that make a positive contribution to the performance scheme. • Despite measures to improve PRB independence, PRB members recruited from ATM industry would still be connected to industry and States. • Potential influence remains via PRU, which performs most of the analysis for the PRB. • Need to swiftly raise PRU is technical skills	*Same as for option 4.2 plus:* • Probably only ATM experts would be nominated limiting the scope of the expertise in PRB. • The independence of the members would need to be overseen closely by the Commission
Risks	• FAB level targets proposed for RP2 could the unintended consequence of slowing down the performance scheme • The performance scheme will lose its momentum	• Risk of political opposition by States	*Same as for option 4.2 plus:* • Considerable risk for the Commission losing control. If PRB appears being ineffective, the performance scheme could be paralysed for years until the legislation can be changed again. • Major political opposition for cancelling comitology

The choice between option 4.2 *Reduced Member State involvement* and option 4.3 *direct nomination of PRB by States and no comitology* requires a detailed analysis of the feasibility to implement these changes in the political decision making process. Experience has shown that Member States, being majority owners of regulated service providers, have no or only limited interest to agree ambitious targets which ultimately would reduce their possibility to earn dividends from service provision and could result in industrial action. Both options aim at reducing the influence of Member States in the setting of targets, in the acceptance of performance plans and corrective measures, however, from a different angle. It can be assumed

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that both options would result in the same benefits for airspace users, though the governance and procedural arrangements differ. The main difference between the two options is the level of risk and consequent uncertainty included in them. Thus, in the following sections, the evaluation of the two options is done simultaneously. Additional considerations and calculations supporting the assessment of economic impacts can be found in Annex V chapter 5.

5.5.1.1 Economic impacts

Cost efficiency: Option 4.2 *reduced Member State involvement* and option 4.3 *direct nomination of PRB by States and no comitology* are designed to have a considerable impact on the level of targets by reducing States ability to water down performance measures in the decision making process. Better consistency between the State and EU targets is likely to be achieved. Experience from RP1 demonstrated that currently it may be difficult to achieve a higher level of ambition than 2% reduction in costs per year. At the same time the PRB/PRU considers that an annual reduction of 5% is possible in RP2, as there is considerable duplication of costs and inefficiencies built into the current programmes. Even assuming a 1.5 percentage point rise in the target (e.g. from 2 to 3.5%), the benefit of these options would amount to roughly € 1.5 billion over the whole reference period, or € 300 million per annum in additional savings for the airspace users. Due to the mechanism of the performance scheme, it can be assumed automatically that whatever targets are set are also met. If the targets are not met and the costs are higher than targeted, they can in any case not be passed on to the airspace users, but have to be covered from other sources instead.

Flight Efficiency: Both options 4.2 *reduced Member State involvement* and 4.3 *direct nomination of PRB by States and no comitology* should bring more ambitious targets, both because of a change in the decision making process, and because of the better information availability leading to more informed decisions and systematic approach. This would allow addressing current inconsistencies between e.g. flight efficiency and charging schemes. Indirect losses generated by the system are currently assessed by the PRB at € 3.8 billion per annum[86], and by achieving slightly higher targets for flight efficiency savings could be in total around € 2 billion per year.

Capacity: Again the potential gains for the both non-baseline options are linked to the impact of higher target levels. As a rule of thumb, PRU experts assume that 1 minute average annual delay costs € 1 billion. Cost optimum models suggest that 0.35 minute delay target (compared to the current 0.5 minute target) is achievable. This would mean that annually € 150 million can be saved by more effective target setting mechanism.

Environmental impact: Any improvements in flight efficiency will deliver also environmental benefits as they reduce the unproductive engine running time and hence fuel burn and emissions.

Administration costs: None of the options are expected to have major administration impacts on the **ANSPs,** except perhaps a need for more timely data delivery. Also no impacts on NSAs or national budgets are foreseen, given that the work of the PRB is financed from the **EU budget.** Option 4.2 *reduced Member State involvement* foresees creation of a new PRB directly under the European Commission. The number of the PRB members should reduce from 13 to

[86] Unless otherwise mentioned, all figures and estimates in this part are derived from PRB work or discussion with PRB representatives

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7[87], which reduces to some extent PRB costs. At the same time PRU may need some extra resources to manage additional technical work, thus cancelling these savings out. Overall impact of both options on the EU budget will be neutral.

5.5.1.2 Social impacts

Impacts on employment and working conditions: Option 4.1. *do nothing* would have already certain negative impact on employment and working conditions as described in section 5.2.1.2. On top of that, as pressure to improve efficiency increases, both options 4.2 *reduced Member State involvement* and 4.3 *direct nomination of PRB by States and no comitology* would be likely to lead additional redundancies, in particular amongst those who work in the support services as these have been determined as the ones with most potential for efficiency improvement. It can be expected that some of the workforce made redundant at air navigation service providers finds employment at the manufacturing industry and other areas where technical engineering skills are required. Furthermore, normally this type of development affects first the older members of staff as they have highest pay and according to national agreements are often eligible for early retirement schemes. Similarly the working conditions (job descriptions) are most likely to change for the support services as their modus operandi evolves.

Safety: Safety should not be impacted by the more ambitious performance targets, given that these form one key performance area. But there could be concerns about the cost cutting possibly leading to trade-offs in safety, unless the oversight authorities are up to the task of effectively enforcing the safety management systems. Therefore it is crucial to strengthen the NSAs as proposed by options 3.2 and 3.3.

5.5.1.3 Environmental impacts

Any improvement in flight efficiency should result in corresponding reduction in emissions and related environmental benefits. As regards noise, there are inherent trade-offs between fuel burn and emission on the one hand, and noise on the other hand[88]. When seeking to improve flight efficiency on horizontal and vertical profiles, it is unlikely that routing will consider noise impact as constrain and therefore no noise benefits are foreseen.

5.5.2 Comparison of options

Economic, social and environmental impacts of this group of options, along with their efficiency/effectiveness are compared in the table below.

The benefits of the performance scheme are linked to the willingness and ability of the NSAs to support and implement the tighter targets. Therefore the actual level of benefits in this policy domain depends on the expertise and independence of NSAs, as discussed in section 5.4. NSA implementation deficit could be countered by the Commission via infringements procedures, but that counter-effect will inevitably come with a delay, whereas the costs are immediate. Therefore, in the table below, for the all economic benefits a 20% uncertainty factor is applied to reflect the uncertainty stemming from the variations in the work of different NSAs.

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87 See Annex V, chapter 5 for details

88 In particular for climb and descent phases of the flight, the routing and climb profile of minimal fuel burn and emissions (utilising e.g. maximum rate climbs) has the counter-effect of increasing noise, given that most efficient route could go through densely populated areas

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Figure 5-8: Comparison of options on the performance scheme governance mechanism

	Option 4.1 Do nothing	Option 4.2 Reduced Member State involvement in the target setting process	Option 4.3 Direct nomination of the PRB by Member States, PRB sets targets directly without comitology
SUMMARY OF IMPACTS			
Economic impacts[89]:			
Cost efficiency	0	++ € 240-300 M p.a.	++ € 240-300 M p.a.
Flight efficiency	0	++ € 1.6-2 Bn p.a.	++ € 1.6-2 Bn p.a.
Capacity/Delays	0	+ € 120-150 M p.a.	+ € 120-150 M p.a.
Administration costs	0	0	0
Social impacts:			
Employment and working conditions :			
NSAs	0	0	0
ANSPs	0	- - ~ - 2800-6000 jobs	- - ~ - 2800-6000 jobs
Safety	0	0	0
Environmental impacts:	0	+	+
EFFECTIVENESS/EFFICIENCY			
Effectiveness:			
Specific objectives:			
SO1: Improve performance of ATS in terms of efficiency	0	++	++
SO2: Improve utilisation of ATM capacity	0	++	++
Operational objectives:			
OO3: Strengthen the process of setting up targets and enforcing the performance scheme	0	+	++[90]
Efficiency			
	0	++ € 2450 M p.a.	++ € 2450 M p.a.

The options exhibit in broad terms similar outcomes, but carry major differences in associated (political) risks. In case of option 4.2 *reduced Member State involvement* the risk is linked to the likelihood of achieving States agreement to the proposal. Option 4.3 *direct nomination of PRB by States and no comitology* carries, in addition to possibly strong political resistance, also a considerable risk as regards EU losing control of the performance scheme. In an optimal situation it might outperform option 4.2, but equally the system could become the hostage of the strong views of a small number of individuals in the PRB (losing the nature of check and balances in the system) and end up reducing the benefits considerably. Therefore option 4.2 is preferred.

89 Ranges provided to encounter for the 20% of uncertainty factor linked to the variations in efficiency of different NSAs

90 N.B. where quantification is impossible due to the amount of variables, the direction and strength of change is indicated with + or – signs and their number. The change is always exhibited against the baseline

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5.6 REFOCUSING OF FABS

5.6.1 Assessment of impacts

The pros, cons and associated risks of the FAB options, as assessed below and in annex V are presented below.

Figure 5-9: Pros, cons and risks of FAB options

	Option 5.1 Do nothing	Option 5.2 Create more prescriptive and enforceable targets/criteria for FABs	Option 5.3 Creation of a more flexible and performance driven FAB-model	Option 5.4 Top-down approach with a new entity created from the Network Manager to design service provision
Pros	• Least political opposition vis-à-vis the States and ANSPs • Minimal new regulation required. • Minimal disruption in those FABs that are further in development and avoids risk of FABs to lose what focus they currently have.	• Provides FABs more focus and direction. • Plans underpinning the FABs would be subject to scrutiny and on-going monitoring. • Keeps existing FABs in place and refocuses them using an evolutionary approach • Relatively simple to implement. • Addresses the alleged legal vacuum that currently exists on what FABs are meant to achieve and look like and when.	• Overcomes the issue of low benefit formal FABs encouraging only performance driven partnerships • Consistent with the philosophy that the performance scheme sets the means, ANSPs choose their means, and the EU intervenes only if targets are not met • Consistent with the NM role– allows the NM to encourage general trends, no micromanagement	• Provides an incentive to encourage service excellence and efficiency. • Transfers performance risk to service providers and gives airlines certainty on pricing. • Much faster rationalization of service provision and consequent reduction in costs and user charges. • Better basis for SESAR, as fewer national approaches. • Seen as an opportunity by the more commercially focused ANSPs.
Cons	• FABs continue to deliver slowly, if at all. • Unacceptable to the airspace users, who see FABs as failures • FABs not effectively supporting the achievement of SES targets • The remaining issues that risk delivery get not addressed	• Until FABs are established as operating entities performance measurement will be problematic • FABs would be not focused on improving performance, but on complying with the formal requirements • Needs to be supported with a robust and effective enforcement mechanism. • Duplicates the performance scheme	• Stronger line required on non-performance • FAB development would become less transparent and complex • FABs become more difficult to manage as interfaces for the NM, SESAR, EU and airlines.	• Would require extensive preparatory work to define the optimums. • Success would depend on the quality of regulation. • Over time the system could lead to an oligopoly of ANSPs • Will take a long time to implement fully (10-20 years)
Risks	• If no action now, the FAB concept may slow down and become marginalised. • ANSPs start deploying SESAR based on the historic State level approach.	• Risk of political opposition. • May lead the Commission deep into the micro-managing of FAB developments	• Risk of diluting the FABs, lack of focus and losing whatever benefits have already been achieved	• Such a radical change could bring unknown risks, including design and concentration related issues. • Risk of political deadlock is very high

5.6.1.1 Economic impacts

Cost efficiency: Option 5.1 *do nothing* is expected to bring only some slow developments as described in section 2.3. Both options 5.2 *prescriptive targets* and option 5.3 *flexible FABs* can

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bring roughly € 10 million annual efficiency benefits (derived conservatively from the initial FABs' implementation plans)[91]. However, the approaches in these options are very different and the success of option 5.2 hinges largely on how well developed and enforced the targets are, whereas in option 5.3 the benefit is tied to the strength of the performance scheme. The potential benefits of the most ambitious option 5.4 *top-down FABs* are considerably higher - about € 680 million per year, once the system is up and running, however the setup would take at least 10-15 years.

Flight Efficiency: Options 5.2 *prescriptive target*, option 5.3 *flexible FABs* and option 5.4 *top-down FABs* should bring moderate benefits compared to the baseline. However in all cases the primary benefits as regards design of airspace configurations, are expected to come from the Network Manager-level co-operation[92].

Capacity: Mostly the same as for cost and flight efficiency (i.e. Network manager is important in driving the change), but in this case the most ambitious option brings more benefits as it would speed up infrastructure planning through centralisation.

Administration costs: For options 5.2 *prescriptive targets* and option 5.3 *flexible FABs* the administration costs would be relatively insignificant. Option 5.4 *top-down FABs* would require reorganisation of entire ANSPs service provision model. Establishment of a new centralised entity would require considerable expertise in airspace design and infrastructure management, but also know-how on management of concessional relations. It is difficult to estimate these additional costs, but at the minimum a staff of 50-100 would need to be recruited, meaning an additional cost of € 0.8-1.6 million (€ 162 000 per person per year[93]). These additional costs could be charged through the route charges, but overall would remain lower than the cost of running 27 separate systems.

5.6.1.2 Social impacts

Impacts on employment and working conditions: Options 5.2 *prescriptive targets* and 5.3 *Flexible FABs* would lead to some limited redundancies (estimated up to 400 redundancies) and changes in working conditions over the time as FABs would seek operational synergies. Option 5.4 *top down FABs* would lead to a rapid consolidation of ANS sector, eventually ending up with 5-6 ANSPs with other ANSPs either being closed down or merged into bigger providers. This would mean not only redundancies, but also a fundamental shift in working conditions, variability of environments and changes in job security. This option would eventually reduce the ANSP employment by at least 1400 jobs.

Safety: None of the options will have safety impacts as long as the oversight arrangements by NSAs are kept in good shape. This makes it increasingly important that the NSA expertise and independence are improved (as considered above) and that EASA continues to be effective in oversight of the NSAs. There have been no reports of private providers having a worse safety record than traditional state owned providers so it can be expected that the ownership model of service provision is irrelevant compared to the robustness of the safety management system.

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91 See Annex V, chapter 6 for details

92 Performance Review Report 2010 http://www.eurocontrol.int/news/performance-review-report-2010-now-available - roughly a quarter of the improvements can only be made at the European level and majority require cross-border co-ordination

93 Costs for supervision in France and Germany for 2011 corrected for overheads and adjusted to EU 27 averages based on GDP per capita expressed in PPP

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5.6.1.3 Environmental impacts

Environmental impacts are linked to improvements in flight efficiency. Elaborate contractual mechanisms need to be used to avoid profiteering at the expense of environment and noise in option 5.4 *top down FABs*, but the potential benefits are equally high as a better optimisation of routing can be triggered by noise and environmental targets.

5.6.2 Comparison of options

Economic, social and environmental impacts of this group of options, along with their efficiency/effectiveness are compared in the table below.

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Figure 5-10: Comparison of FAB options

	Option 5.1 Do nothing	Option 5.2 Create more prescriptive and enforceable targets/criteria for FABs	Option 5.3 Creation of a more flexible and performance driven FAB-model	Option 5.4 Top-down approach with a new entity created from the Network Manager to design service provision
SUMMARY OF IMPACTS				
Economic impacts:				
Cost efficiency	0	+ ~€ 10 M p.a.	+ ~€ 10 M p.a.	+++ ~€ 680 M p.a.
Flight efficiency	0	+	+	+
Capacity/Delays	0	+	+	+
Administration costs	0	0	0	€ 0.8-1.6 M p.a.
Social impacts:				
Employment and working conditions :				
NSAs	0	0	0	0
ANSP's	0	~ - 400 jobs	~ -400	~ -1400 jobs
Safety	0	0	0	0
Environmental impacts:	0	+	+	+
EFFECTIVENESS/EFFICIENCY				
Effectiveness:				
Specific objectives:				
SO1: Improve performance of ATS in terms of efficiency	0	+	+	++
SO2: Improve utilisation of ATM capacity	0	+	+	+
Operational objectives:				
OO4: Strategic redirection of FABs.	0	+	++	++
Efficiency				
	0	+ ~€ 10 M p.a.	+ ~€ 10 M p.a.	+++ >€ 680 M p.a.

In conclusion it can be said that option 5.4 *top-down FABs* has by far the highest possible efficiency and capacity benefits, but it is also politically very difficult to implement and contains some serious technical feasibility risks. Time for such a revolutionary restructuring of the sector may not yet be ripe. Option 5.3 *flexible FABs* provides roughly the same benefits as option 5.2 *prescriptive targets*, but is better aligned with the underlying principles of the performance scheme and thus more coherent with existing SES framework. It also carries additional potential if combined smartly with other options (see chapter 6). Therefore it could be recommended as the preferred option, in condition that a deadline should be set by which the new FABs will be assessed in terms of their capability to contribute to the performance targets. If their value added then is not apparent, development in line of the top-down option 5.4 would be invoked.

5.7 ROLE OF THE NETWORK MANAGER

5.7.1 Assessment of impacts

The pros, cons and associated risks of the network manager options, as assessed in this part and in annex V, are presented below.

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Figure 5-11: Pros, cons and risks of the options on the role of the network manager

	Option 6.1 Do nothing	Option 6.2 Operational governance by industry, EU and MS simplified strategic governance	Option 6.3 Joint undertaking of the industry to operate the Network Manager	Option 6.4 Options 6.2 or 6.3 with Eurocontrol being Network Manager, including airspace design
Pros	• The NM may need some time for current functions/processes/relations to mature	• Greater user influence • Allows the NM to effectively manage the performance of the network. • Enhanced cooperation	• Greater user influence • The NM maintains neutrality needed for centralised services. • A more strategic partnership between FABs and Network Manager may reduce duplications. • Dependency of the Network Manager role and SESAR is recognised supporting achievement of the European ATM Master Plan	• Establishes a semi-commercial model as an option for provision of ATM support services. • May lead to centralisation of additional services (e.g. MET) providing scale effects • ANSP given direct management oversight. • Optimal solution for harmonisation of systems and facilitating alignment with SESAR.
Cons	• The NM remains weakly integrated into the planning and investment decisions of ANSPs • The NM may struggle in establishing itself as a strategic partner to ANSPs and FAB • No basis for widening the scope of functions	• The NM has no enforcing powers • The Network Manager relies on ANSPs/FABs to deliver network performance, but this option could make them less committed	• The State and ANSP stakeholders need to be prepared to work through the FAB structure.	
Risks	• If the NM functions are not extended to support SESAR, the deployment of SESAR may be delayed	• User priorities (being often short-term) may not align with SES or SESAR priorities	• User priorities (being often short-term) may not align with SES or SESAR priorities	• Many States would oppose a commercial model if outsourcing to external companies is used.

5.7.1.1 Economic impacts

Cost efficiency: Impacts of the options 6.2 *operational governance to industry* and 6.3 *joint undertaking* would be only marginally positive. While user influence increases, the decisions on service provision remain ultimately in hands of ANSPs. Still, under option 6.3 there would be more scope for the Network Manager services which would slightly improve the potential for efficiency gains. Option 6.4 *centralised services* would have considerable potential for improving the baseline situation, but the level of outcome depends on the precise content and format of the centralised services provided by the Network Manager[94]. However, even a conservative estimate would be a benefit of € 150-200 million over the next decade and there is a possibility for multiplication (up to 10 times) of this benefit with inclusion in the scope the meteorological services and some prospective SESAR functions[95].

Flight Efficiency: For options 6.2 *operational governance to industry* and 6.3 *joint undertaking* the impact would be only marginally positive due to the increased influence of airspace users. Option 6.4 *centralised services* would be expected to have more profound effect by pushing the performance achievements towards the higher end of the RP2 flight efficiency targets.

94 Would be determined by comitology procedure

95 See Annex V, chapter 7 for further details

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Capacity: As for flight efficiency, the impacts of options 6.2 *operational governance to industry* and 6.3 *joint undertaking* would be only marginally positive. Option 6.4 *centralised services* would have potential for higher delivery through improvements in flow management via introduction of effective 4D trajectory management[96].

Administration costs: Administration costs would remain unchanged for option 6.2 *operational governance to industry* as model will be very similar to the existing one. In option 6.3 *joint undertaking* the costs of running the Network Manager Board would be doubled as more frequent meetings are needed. These costs would be covered through the route charges in the standard manner. In option 6.4 *centralised services* there would be some additional administration cost in EASA overseeing the enlarged Network Manager. This cost could be recovered in the normal manner from the entity being overseen (i.e. in this case the Network Manager). In total these costs would not exceed one FTE (i.e. € 162 000) for options 6.2 and 6.3 as all the additional work is just incremental addition to already existing work. For option 6.4 a second FTE should be accounted for.

Box 5-4: Business case for a centralised network services[97]

The concept of more centralised services for the network manager is built on the success of initiatives such as the European AIS Database (EAD[98]) and, more recently, the PENS network service[99]. The objective of any centralised service must be to meet user's requirements in an efficient way, avoiding duplication of the service across the user base. Centralised services are also driven by an imperative to collaborate, and may show some or all of the following characteristics:

- require information to be shared with a high degree of trust (accuracy, integrity, confidentiality and security);
- provide services that may be complex and therefore difficult to fulfil;
- meet common needs of users without generating a 'superset' of requirements;
- provide a common view of information, typically through a single point of access;
- provide de-facto harmonisation of information and its formats and processes;
- support open source access to enable users or other suppliers to innovate value-added services (without duplicating costs to stakeholders).
- Allow for deploying SESAR concepts from a blank sheet with minimal cost.

It would be reasonable to expect a compelling business case for a centralised service, which will not only account for cost-benefit analyses but also consider risks and benefits to service quality. The ideas and initial investigations for a centralised service should arise through existing bodies, such as Eurocontrol, FABs, other ANSP Alliances and, in the future increasingly the SESAR Deployment Manager. The Network Manager is the logical coordinating point/contracting agent for a number of the services currently provided by ANSPs individually and in particular for the entirely new services arising from SESAR.

5.7.1.2 Social impacts

Impacts on employment and working conditions: There will be no impact under options 6.2 *operational governance to industry* and 6.3 *joint undertaking*. In case of option 6.4

96 4D trajectory management is one of the key SESAR concepts, which transforms current air traffic flow management function into time-based activity, where tight time windows are used to determine the position of the aircraft at each point along its route. This allows for example to maximise runway capacity as any idle moments on the runway can be avoided and conversely no aircraft will have to wait in the air for the runway to become free as the aircraft will not be allowed to depart before a clear and optimal trajectory along its route can be guaranteed all the way to the destination gate.

97 Further details in Annex V, chapter 7

98 www.ead.eurocontrol.int/eadcms/eadsite/index.php.html

99 www.eurocontrol.int/articles/pan-european-network-services-pens

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centralised services the practise of tendering out of the centralised services for time-bound concessions would incur periodic changes in the companies providing these services and subsequently job security in these companies would be lowered. However, many of these services are new services, being created by the SESAR programme. No reduction in overall staff numbers is expected.

Safety: No effects in any of the options.

5.7.1.3 Environmental impacts

Linked to the changes in flight efficiency, the impacts in options 6.2 *operational governance to industry* and 6.3 *joint undertaking* would be only marginally positive. Option 6.4 *centralised services* would be expected reduce emissions more substantially.

5.7.2 Comparison of options

Economic, social and environmental impacts of this group of options, along with their efficiency/effectiveness are compared in the table below.

Figure 5-12: Comparison of the options on the role of the network manager

	Option 6.1 Do nothing	Option 6.2 Operational governance by industry, EU and MS simplified strategic governance	Option 6.3 Joint undertaking of the industry to operate the Network Manager	Option 6.4 Options 6.2 or 6.3 with Eurocontrol being Network Manager, including airspace design
SUMMARY OF IMPACTS				
Economic impacts:				
Cost efficiency	0	+	+	++ ~€ 15-20 M p.a.
Flight efficiency	0	+	+	++
Capacity/Delays	0	+	+	++
Administration costs	0	- € 0.16 M p.a.	- € 0.16 M p.a.	- € 0.32 M p.a.
Social impacts:				
Employment and working conditions :				
NSAs	0	0	0	0
ANSPs	0	-	0	-
Safety	0	0	0	
Environmental impacts:	0	+	+	++
EFFECTIVENESS/EFFICIENCY				
Effectiveness:				
Specific objectives:				
SO1: Improve performance of ATS in terms of efficiency	0	0	0	++
SO2: Improve utilisation of ATM capacity	0	0	0	++
Operational objectives:				
OO5: Strengthen the governance and operational scope of the Network Manager	0	+	+	++
Efficiency				
	0	+	+	++ ~€ 15-20 M p.a.

In conclusion, option 6.4 brings the greatest efficiency and capacity benefits and the only question is whether it should be combined with the governance model in option 6.2 or 6.3. As

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noted in the cost efficiency assessment, option 6.3 has a slight edge in the sense that being fully industry-run, the organisation would probably seek efficiencies slightly more actively than in case of States-run organisation which could continue defending national status quos. Moreover, given that the Network Manager providing the centralised services would essentially be an ANSP like any other, it would be logical to choose a combination of options 6.4 and 6.3 as the preferred option.

6 ASSESSMENT OF POLICY SCENARIOS

6.1 FORMATION OF POLICY SCENARIOS

In chapter 5, 20 policy options in different policy domains were assessed. In this chapter the options will be combined together to form 3 policy scenarios, each covering all six policy domains.

Three policy options have been discarded after the first round of assessment, as carrying too high risks with limited or uncertain benefits:

- Option 2.3 –*user participation in the ANSP governance board*– while this is marginally more effective than option 2.2 *improved consultation and sign-off*, it carries high risk of political opposition and it could result in lesser support for long-term investments and SESAR deployment.
- Option 4.3 – *direct nomination of PRB by States and no comitology* – has been discarded given that it carries risk of political opposition, but could also become hostage to the strong views of a small number of individuals in the PRB. At the same time its effectiveness is roughly the same as for Option 4.2 *reduced Member State involvement in the target setting process.*
- Option 5.4 – *top-down FABs* has by far the highest possible efficiency and capacity benefits, but at the same time it is politically very controversial and contains some serious technical feasibility risks.

Finally Option 6.2 *operational governance to industry* has been dropped as its effects compared to the baseline would be only marginal.

Remaining options have been grouped to three policy scenarios as outlined in Figure 6-1.

Figure 6-1: Formation of policy scenarios

Policy domain	Policy scenario 1: Baseline	Policy scenario 2: Risk optimised	Policy scenario 3: Performance optimised
1. Support services	1.1 Do nothing	Option 1.2: Functional separation of support services	Option 1.3: Structural separation of support services
2. Focusing ANSPs on customer needs	2.1 Do nothing	Option 2.2: Improved consultation and sign-off	Option 2.2: Improved consultation and sign-off
3. Ineffective role of NSAs	3.1 Do nothing	Option 3.2: Mutual co-operation and expert pooling	Option 3.3: 3.2+ Institutional separation of NSAs from ANSPs
4. Performance scheme governance mechanism	4.1 Do nothing	Option 4.2: Reduced Member State involvement	Option 4.2: Reduced Member State involvement
5. Refocusing of FABs	5.1 Do nothing	Option 5.2: Prescriptive FAB targets	Option 5.3: Flexible FABs provides
6. The role of the network manager	6.1 Do nothing	Option 6.3: Industry Joint Undertaking	Options 6.4+6.3: Industry Joint Undertaking + Eurocontrol as enlarged Network Manager

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Scenario 2 seeks to secure a moderate improvement, with less resistance from the authorities and the ANSP sector, thus causing minimal political risks. It has a chance of getting a wider political support and of creating less concern in the ANSP sector, given that the most politically contentious options, such as structural separation of support services (option 1.3) and institutional separation of NSAs from the ANSPs (option 3.3) have been left out. It can be expected that many States would tend to be protective towards their ANSP's and therefore they would prefer scenario 2 to scenario 3. However, this excludes possibility to apply option 5.3 (creation of a more flexible FABs) as the latter would be meaningful only if ANSP services were unbundled. As a consequence, FABs can in this scenario only be enforced using prescriptive targets, which would duplicate the performance scheme and could result in situation where the co-operation in FABs becomes disconnected from market needs. Airlines and most of the other civilian airspace users appear to be unitied in support of Scenario 3, due to the greatest promise of performance improvements and especially cost cuts, whilst for the same reason the unions and representative organisations have differing approaches. Service providers themselves appear somewhat divided, but there is an increasing element of them looking for new business opportunities, which would arise from the Scenario 3 proposals for support services, FABs and the Network Manager.

Scenario 3 accepts a higher risk of opposition, but has the potential to improve performance considerably by more ambitious policy options but also through synergies between the options in different policy domains. For example:

- More flexible FABs with the possibility of multi-directional co-operation (option 5.2) can only work optimally if the big question of airspace organisation is moved to the network level (i.e. the Network Manager option 6.4). This would leave the ANSPs more flexibility as how to organise FAB co-operation in the other parts of their operation.
- Enforcement of the Network Manager (6.4) supports achievement of performance targets. In particular, airspace configuration is a matter, where the benefits of centralisation are particularly strong as routes can be drawn optimally for flights spanning more than one FAB.
- Institutionally separated NSAs (option 3.3) strengthen the option 4.2 *reduced Member State involvement in the target setting* considerably by allowing the NSAs to devise national targets without conflicts of interest. It also puts all ANSPs on a level playing field vis-à-vis their oversight authorities in a situation where option 1.3 unbundles the support services into separate organisations.
- Option 1.3 on *structural separation of support services* creates multiple service units and thus enabling flexible service provision in FABs. In these conditions support services can be shared and tendered by several core ANSPs together. It also facilitates centralisation of certain services under the Network Manager.
- Option 3.2 on NSA co-operation and expert pooling promotes cross-border approach and thus support FAB development. At the same option 3.3, which adds to this an organisational separation of NSAs, can better ensure that performance improvement would not lead to trade-offs in terms of safety. Independent NSAs would also increase the probability of more ambitious targets.
- Option 2.2 *improved consultation and sign-off of investment plans* helps to push the ambition level of performance targets addressed by option 4.2.

Importantly, the performance optimised scenario 3 is clearer in creating an environment where the roles of the different actors are well defined. This scenario focuses on the actual customers

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of the system – the airspace users and is therefore supported by airlines and other airspace users, who have been very vocal about the need for change. However the reforms required in ANSP sector are more radical and would be met with significant opposition.

Hence the third scenario seeks to maximise performance gains, whilst still being politically acceptable. Scenario 3 is also strongest in supporting the general recommendation of the 2011 Commission communication, which recommended that "*In particular, the Union needs to establish an integrated European air traffic management system, a true network with a single governance structure and a stronger regulatory and oversight capability*". The SES2+ initiative and in particular Scenario 3 should support this goal;

- **an integrated European air traffic management system** is supported, by introducing harmonised operating rules under the EASA framework, by reinforcing the Network Manager to operate network-level services and by FABs to run local service provision in a more integrated manner.
- the replacement of 27 national regulatory environments by a **single governance structure** is ensured by a single system, where EASA drafts common technical rules, the Commission focuses on economic regulation and enforcement of harmonised EU rules and Eurocontrol on operating the Network Manager, whilst Member States implement nationally the rules agreed jointly in the Single Sky Committee.
- **a stronger regulatory and oversight capability** is ensured by the abovementioned structure, where NSA's are finally made independent of the entities they oversee and EASA not only drafts rules as a body bringing together best EU expertise in ATM, but also supports the NSAs by organising common forums to exchange best practises and pool experts so that the deficiencies n NSAs resources can be overcome.

6.2 ASSESSMENT OF IMPACTS OF THE POLICY SCENARIOS

To compare the economic effect of the various scenarios the assessment of the individual options in chapter 5 has been brought together in figure 6-2 comparing the impacts and effectiveness/efficiency/coherence of the three policy scenarios.

6.2.1 Economic impacts

Accounting for synergies

In assessing the economic impacts of the options on the performance scheme governance mechanism (options in policy domain 4), an uncertainty element was factored in to reflect the ambiguity stemming from different effectiveness levels of NSAs (c.f. section 5.5.2). In the context of scenarios, proper functioning of NSAs is critical to the maximum effects of many other options. Therefore for scenario 2 – which does not require full NSA independence – the lower end of the benefit ranges have been used, while for scenario 3 - with the full separation of NSAs - high end of the range is applied.

Accounting for overlaps

Assessment has shown that the overlaps in terms of benefits are not major, and relate to key role of NSAs being the guarantors of the system. The role of NSAs is central in setting and enforcing the national targets within the performance scheme and their effect is already

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factored into the analysis as described above. Therefore the benefits arising from option group 3 (Ineffective role of NSAs) alone[100] have been cancelled out in the scenario analysis.

It should also be noted that the benefits would in reality not occur in a linear line, although they are mostly expressed per annum. For example the expected annual benefit of € 450 million from unbundling (Option 1.3) would take some time to realise as a truly competitive market requires several years to develop to its full potential. Therefore the performance optimised scenario would probably initially deliver results similar to the risk optimised scenario and improve over the time to produce additional benefits.

In addition, a high level assessment of the macro-economic impact has been carried out by the consultant using the E3ME macro-economic model, with efficiency benefits for aviation sector used as inputs[101].

6.2.2 Social impacts

As regards employment in the ANSP's, a reduction in costs will lead to fewer employed staff in the ATM industry. These developments were already factored in while SES was agreed to in 2004 and in 2009, as the performance improvements and technological modernisation agreed at the time require a reform of the way the ATM system operates and a reduction in the resources used to run the system. Based on the PRB indicative ranges of cost reduction, the IA support study estimated[102] that the different scenarios could lead to the following reductions in staff over the period 2015-2019, based on 46 300 staff in 2014[103]:

- "Do nothing" scenario, up to 500 reductions in staff;
- "Risk optimised" scenario, up to 3400 reductions[104] in staff;
- "Performance optimised" scenario, up to 9400 reductions in staff;

The overwhelming majority of these reductions is expected to occur in support services and administration. The job losses in ANSPs would be mitigated by the growth of the employment in NSAs. In addition, the Network Manager with an extended scope would need to outsource services from different providers, creating new employment and business opportunities. To some extent also engineering personnel would be affected, although the future technological modernisation challenges are likely to overshadow the impact for them. On the other hand the situation for core air traffic control personnel seems very likely to remain stable or even grow as dictated by traffic growth[105]. There will be also slight increase in the employment in NSAs.

In summary, policy scenario 2 has a lower immediate negative social impact than scenario 3 as far as ANSPs and Member States authorities are concerned. However it puts a burden on the

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100 Option 3.2 *mutual co-operation and pooling of experts*- ~ €75 million p.a. and option 3.3. adding to 3.2 also *institutional separation* - ~ €150 million p.a.

101 See http://www.camecon.com/AnalysisTraining/suite_economic_models/E3ME.aspx and chapter 1 of Annex V for further information

102 See Annex V, chapter 8.

103 Based on staff figures for 2010 (ACE2010) of 45165 extrapolated to 2014 using changes recorded in ACE2007 – 2010 reports. Different scenarios' annual rate of cost decreases were then applied to the staff numbers. Scenarios were as defined in 'EU-Wide Targets for RP2 Indicative Performance Ranges for Consultation February 2013'.

104 Scenario 2 and 3 impacts are on top of the baseline

105 This seems to be the evidence from the NavCanada case, where numbers of controllers have grown to handle the increase in traffic, but overall staff has been reduced by 20%. See also discussion on option 1.3 in Chapter 5 and Annex V.

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airspace users by creating a less favourable operating environment with the corresponding loss of additional growth and jobs. On a societal scale scenario 3 has more long-term potential by helping create a competitive and sustainable aviation system that serves the EU economy and supports employment, even if during the restructuring phase it causes employment shifts and social costs, in particular for the ANSPs and some NSAs[106]. Considering the long-term social effects of a healthy economy in the air transport sector, scenario 3 is considered most favourable despite the short term costs. However it also necessitates a thorough implementation of the existing social dialogue processes to mitigate the negative impacts and as far as possible to plan changes so that they can be achieved through natural development of retirements and mobility. Considering the relatively long timescale of change, it is unlikely to lead to rapid pay-offs, but rather be manageable through a natural process, if due care is taken.

At the level of the general economy, the more favourable business conditions for airlines should induce new working places in general economy, which should increase employment up to 13 000. The new jobs are expected to be primarily created in the airline and airport sectors, as they will see higher levels of activity through lower costs and higher capacity, but also the usual secondary impacts in related fields will be taking place. In the case of aviation this secondary impact tends to be considerable at times such as now, when the air traffic system has capacity bottlenecks and thus acts as a hindrance to overall economic growth.

6.2.3 Environmental and noise impacts

Environmental costs in ATM are a function of flight efficiency, which attempts to minimise the current average 42km/flight route extension. Any shortening of the route towards the optimal great circle route reduces fuel burn and emissions. The average en-route route extension was 4.6% of the routes flown in 2011 and each 0.1% improvement in that extension reduces fuel burn by 30 000 tons. This translates to 92 000 tonnes of CO_2 as well as less NOx reductions and less particulate matter. In particular, a stronger Network Manager with powers to determine the broader airspace configurations as described in scenario 3, would bring the greatest benefits. Even if we assume that only the en-route part is affected and no improvements in the interfaces with airport terminal areas can be achieved, that would correspond to potential 3% (instead of 4.6%) route extension and CO_2 reduction of 2.76 million tons[107].

Noise can be greatly impacted by these scenarios if the Network Manager is extended to cover departure and arrival routings. Benefits can be achieved both for noise and environment, although a significant trade-off between emissions and noise exists[108]. ATM routings would still have close to a zero-sum impact[109] on environment, even if the Network Manager functions were extended to departure and arrival routings.

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106 For those which are still only functionally separated from the ANSP. Entirely functional separation exists in Cyprus, Greece, France and Ireland, whilst Portugal (MET), Netherlands (MET), Spain (Military) and Denmark (AIS) have a small part of the oversight with only functional separation, whilst the majority is institutionally separated

107 This assumes also that the aircraft manufacturers plans for technological development in reducing fuel burn to counter for the increase in traffic, are realised.

108 See section 5.6 on environment in PRB study on RP 2 http://ec.europa.eu/transport/modes/air/consultations/doc/2012-06-08-regulatory-approach-document.pdf

109 The least fuel burn – and consequently least emissions – as well as best safety is achieved by a climb at maximum power directly to cruising altitude. However this also creates the greatest amount of noise and that noise is concentrated close to the airport instead of being distributed more evenly in the population.

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6.2.4 Assessment of impacts on competitiveness of EU aviation sector vis-à-vis the aviation sector of third countries

The aviation sector is globally in a state of transformation and modernisation, so any comparison can be done against a moving target. However the most relevant comparison for EU is with the US system, which is comparable in most respects and for which good data exists. Major modernisation efforts are underway in both regions, but it is safe to say that scenario 3 would have the potential to narrow the gap in the competitiveness of the ATM system considerably and most likely achieve today's US levels of competitiveness by the 2025 target date.

6.2.5 Assessment of impacts on the non-EU operators

Under ICAO rules third country airlines enjoy access to EU airspace, with no major hindrances. Any improvement in the competitiveness of the EU ATM system would benefit each airline flying in the EU. This benefit would be proportionate to the amount of miles flown in EU airspace.

6.2.6 Assessment of impacts on micro, small and medium sized enterprises

All national ANSPs are currently large enterprises, thus this initiative will have no direct impacts on SME. Any indirect impacts are also limited, given that the ATS charging system exempts aircraft that fly under Visual Flight Rules or which have a maximum take-off weight below 2.5 tonnes. The improvements in cost-efficiency would have a small positive impact on those small aircraft operators that are covered by the charging rules, being proportional to the amount of charges paid. There is however one particular area, where the initiative may create new SMEs, which is unbundling. Even if it is more likely that opening the market for the support services would lead to consolidation of already large providers, it is also possible that SME's with an innovation edge would have a chance in areas such as aeronautical information, meteorology or communications services. Some SMEs could also participate in groupings of companies competing for tenders initiated by the Network Manager.

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6.3 COMPARISON OF THE POLICY SCENARIOS

Analysis presented in chapters 5 and 6 as well as Annex V is summarised in the table below.

Figure 6-2: Comparison of policy scenarios

	Policy Scenario 1 Baseline scenario	Policy scenario 2: Risk optimised[110]	Policy scenario 3 Performance optimised*
SUMMARY OF IMPACTS			
Economic impacts:[111]			
Cost efficiency	0	>€ 250 M p.a.	>€ 780M p.a.
Flight efficiency	0	>€ 1.6 Bn p.a.	>€ 2 Bn p.a.
Capacity/Delays	0	>€ 120 M p.a.	>€ 150 M p.a.
Administration costs[112]	0	€ -7.9-9.7 M p.a.	€ -13.8-16.8 M p.a.
Macroeconomic impacts			
GDP p.a. 2020/2030	0	~€ 600 M/ €700 M	~€ 750 M/€ 900 M
Employment 2030	0	~+10 000	~+13 000
Of which airlines employment 2020/2030	0	+	~+500/+3000
Social Impacts:			
Employment and working Conditions for the workers in			
NSAs	0	+	~+80 jobs
ANSP's	0	~ -3400	- ~ -9400
Safety	0	+	++
Environmental impacts			
Noise	0	0	0
Emissions	0	++	++
EFFECTIVENESS/ EFFICIENCY/ COHERENCE			
Effectiveness:			
Specific objectives:			
SO1: Improve performance of ATS in terms of efficiency	0	++	+++
SO2: Improve utilisation of ATM capacity	0	+	+
Efficiency excluding macro-economic impacts	0	Net benefits ~ € 1960 M p.a.	Net benefits ~ € 2915 M p.ap
Coherence	0	+	++

As regards **effectiveness**, the overall differences between the two scenarios are narrowed down by the common choice of the performance scheme option 2.2. As regards improving the utilisation of ATM capacity, there is no major difference between the two scenarios. However, it is clear that the unbundling of ancillary services and full separation of the NSAs from the ANSPs would produce important additional efficiency benefits in the performance optimised scenario 3. The full separation of the NSAs in scenario 3 reduces greatly the uncertainty as regards the performance scheme, thus making it more likely that the NSAs will support tighter targets and thus the full benefits of option 4.2 can be achieved. Even if the difference in savings between the two scenarios is disregarded, the safety benefit of introducing independent oversight of ANSPs through option 2.3 is alone enough to tip the scales in favour of the performance optimised package. Furthermore, structural separation of support services will make it more likely that the FABs will steer towards flexible forms of service provision letting

111 Overlaps have been cancelled as described above

112 Due to uncertainties involved in future pay-scales, actual need of personnel and various external factors, a 20% uncertainty factor has been applied

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the market to find the most efficient providers. It would also allow to develop a supply of services which could be potentially bought in by the Network Managers for centralised service provision.

Considering **efficiency** the inputs required for the expected outputs in scenarios 2 and 3 are fairly similar, except for some 20% higher administration costs in scenario 3. However this additional administration cost triples the cost-efficiency gains, so in the end scenario 3 has the highest efficiency score. Less easy to quantify is the social cost of redundancies related to outputs. Restructuring and modernisation in ATM sector would result in ANSP staff reduction by about 3400 in scenario 2 and 9400 in scenario 3. Some new jobs will be created at NSAs as well as by the external service providers supporting ANSPs and the NM. Most importantly, the efficiency driven growth in the aviation sector would induce 10 000 jobs in overall economy if scenario 2 is chosen and some 13 000 in the case of scenario 3.

As regards **coherence** of the scenarios, both scenarios are coherent with horizontal EU policies as described in section 3.4. In addition, the performance optimised scenario receives a better evaluation for being clearer in creating an environment where the roles of the different actors are well defined. ANSPs are free to focus on improving their services (Network Manager being one of the ANSPs), NSAs and airspace users steer the ANSPs in governance and performance scheme respectively and act as checks on mismanagement, whilst the performance scheme itself sets the targets based on the objective criteria and technical analysis.

In conclusion, the performance optimised scenario 3 is considered to be the preferred policy choice.

7 MONITORING AND EVALUATION

7.1 EVALUATION ARRANGEMENTS

Regarding the evaluation, the Commission is already obliged under art 12(2) of Regulation 549/2004 to review the application and effectiveness of SES rules at the end of each performance scheme reference period. The intention is to continue with this system. Next report is due for 2015 and the one after that 2020. As part of these evaluations, the Commission will evaluate whether the objectives of the initiative were achieved, and if not, consider which additional steps need to be taken in order to complete the task.

7.2 MONITORING ARRANGEMENTS

The table below lists key monitoring indicators to follow up the performance in terms of specific objectives. Source of information would be the Performance Review Body annual reports of the performance of the EU ATM system and the monthly reports issued by the Network Manager. In its regular work the Performance Review Body monitors the various trends and developments related to SES, and sets targets on areas such as flight efficiency, cost-efficiency, environment and safety on the service providers. The attainment of these targets is also monitored on a constant basis and reports and recommendations are provided annually. Whilst the system has been created primarily as a performance scheme, it also doubles as a thorough monitoring and target setting mechanism for the overall development of the SES.

Figure 7-1: Proposed monitoring indicators

Specific objective	Monitoring indicators

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Specific objective	Monitoring indicators
SO1: Improve performance of Air Traffic Services in terms of efficiency	• Delays (min/flight) • ANSP-related costs to users • Reduction in average flight extensions • Reductions in emissions
SO2: Improve utilisation of air traffic management capacity	• En-route flight efficiency • Improvement in runway throughput at currently capacity constrained airports

It is not straightforward to define indicators for the follow up of the operational objectives, which mostly relate to effectiveness of different governance mechanisms. Therefore it is planned to assess the progress in terms of the operational objectives based on:

- EASA audit reports in Member States;
- accident investigation reports;
- interviews and consultations of various stakeholders;
- exchange in different expert groups and committees, such as Single Sky Committee, Industry Consultation Body, Expert group on social dimension, EASA Thematic Advisory Group for ATM and the annual SES conferences.

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ANNEX I
ABBREVIATIONS USED

ACC	Area Control Centre
ADF	Automatic Direction Finding (radio navigation aid)
AEA	Association of European Airlines
AIS	Aeronautical Information Service
ANS	Air Navigation Services
ANSP	Air Navigation Service Provider
ATCO	Air Traffic Controller
ATFM	Air Traffic Flow Management
ATM	Air traffic Management
CFMU	(Eurocontrol) Central Flow Management Unit
CNS	Communication, Navigation and Surveillance services
CTR	Control Zone (Controlled airspace immediately around an airport)
EASA	European Aviation Safety Agency
ERA	European Regional Airlines Association
FAA	(US) Federal Aviation Administration
FAB	Functional Airspace Block
ICAO	International Civil Aviation Organisation
IATA	International Air Transport Association
IFR	Instrument Flight Rules
NATS	National Air Traffic Services (The main UK ANSP)
NERL	NATS En-Route Limited (Part of NATS serving en-route traffic as opposed to aerodrome services etc.)
NM	Network manager
NSA	National Supervisory Authority
MET	Meteorological services

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PRB	Performance Review Body
PRC	Performance Review Unit (precursor or PRB, which continues for non-EU States benefit)
PRR	(Annual) Performance Review Report (by the PRB/PRC)
PRU	Performance Review Unit (support unit to PRB/PRC)
R&D	Research and Development
RP	Reference period (in performance scheme)
RVSM	Reduced Vertical Separation Minima (allows for aircraft flying closer to each other at high altitudes)
SES	Single European Sky
SSC	Single Sky Committee
TMA	Terminal Area (Controlled airspace around the airport, above the CTR)
VOR	Visual Omnidirectional Range (radio navigation aid)
VFR	Visual Flight Rules

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ANNEX II
ROLES OF DIFFERENT PLAYERS IN THE ATM SYSTEM

The aim of this annex is to quickly orientate the reader on the key actors involved in air traffic management in Europe.

European Commission

The European Commission has been stimulating reforms to air traffic management since the 1990's. In 1995 the Commission produced a white paper[113] that defined a number of issues with ATM and proposed a 'single ATM system for Europe', including a number of institutional changes. In the late 1990's delays to commercial aircraft were becoming unsustainable, and IATA developed a '5 point plan' the European Commission has been developing reforms to European Air Traffic Management under the banner of the 'Single European Sky'. The first legislative package drew on advice from a High Level Group and came into effect in 2004.

EASA

The European Aviation Safety Agency (EASA) was set up in 2003 to ensure a high and uniform level of safety in civil aviation, through the implementation of common safety rules and measures as well as covering environmental aspects and the traditional Union goals of free movement of goods and people and a level playing field amongst economic operators[114]. EASA effectively replaced the Joint Aviation Authorities, itself set up to enable States to collaborate in the joint development of airworthiness rules and regulations. EASA's scope of activity has progressively been enlarged to include also air operations, flight crew licensing, third country operators and most recently in 2009 also air traffic management and airport regulation. With this latest extension its scope was completed to cover all sectors of aviation and progressively it has become the central co-ordinator of all technical rules in these sectors.

Eurocontrol

At the time of its founding in the early 1960's, Eurocontrol was initially intended to be an intergovernmental organisation responsible for the entire upper airspace of the six initial Member States, with plans for three international Air Traffic Control centres to be set up. However, the majority of the European States were not prepared to give up as much sovereignty over their own airspace as Eurocontrol would have needed and the focus shifted from integration to cooperation[115]. Currently Eurocontrol is active in areas such as SESAR related R&D, support to States in implementation of the SES initiative, support to the EU in rule drafting and oversight and most visibly it has been nominated to host both the EU Performance Review Body and the Network Manager, where it provides vital EU functions.

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113 COM/96/57, 'Air traffic management – freeing Europe's airspace', 6 March 1996.

114 Regulation 216/2008 Art 2

115 Eurocontrol, '1963-2003, 40 years of service to European aviation'

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Eurocontrol is defined by its convention, which has undergone several revisions since the first convention in 13 December 1960. Article 2 of the 1997 revised convention[116] has not been ratified and is somewhat outdated. Hence 2013 is likely to see the start of work to draft an entirely new convention more in line with the organisations current and future roles in support of the SES initiative and increasingly focusing on operational tasks through the Network Manager, support to SESAR deployment and the performance scheme.

Network Manager

The Network Manager was created by the SES II package[117] and the Network Management implementing rule[118] to perform four initial services, which are best exercised at Network level. These functions are:

- Air Traffic Flow Management (ATFM)
- Route design
- Co-ordination of radio frequencies amongst radio stations
- Co-ordination of radar transponder codes

Further to these it also hosts the European crisis co-ordination cell. The rules also foresaw the possibility to extend the functions further, in particular to tasks linked to the SESAR Master Plan. Already in its current shape, it carries some important sub-tasks and for example the Network Strategy Plan and Network Operations Plan have become important reference documents for operational planning.

Air Navigation Service Providers

Air navigation service providers typically provide a range of services to support the safe separation and expeditious conduct of flights. This includes air traffic control of flights in "controlled airspace" and other services such as "flight information services" outside of control services. As defined by ICAO, Air navigation services comprise air traffic management (ATM), communications, navigation and surveillance systems (CNS), meteorological services for air navigation (MET), search and rescue (SAR) and aeronautical information services (AIS). These services are provided to air traffic during all phases of operations (approach, aerodrome and en route).

Air traffic management is further divided into air traffic services, airspace management and air traffic flow management. Of these air traffic services are the central block and include air traffic control (en-route, terminal and aerodrome), flight information services, etc.

Airspace Users

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116 Protocol consolidating the Eurocontrol International Convention relating to Co-operation for the Safety of Air Navigation of 13 December 1960, as variously amended

117 Regulation 550/2004 Art 6

118 Regulation 677/2011

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The airspace users include commercial air transport operators (scheduled and charter airlines, freight, air taxi), business aviation (private operators), military/State aircraft and general aviation (mostly private and recreational aviation). When flying under instrument flight rules, all aircraft above 2 tons maximum weight pay route charges which are proportional to the distance travelled and aircraft weight. These charges are collected by the central route charges office, a centralised service managed by Eurocontrol.

The Military have a number of airspace needs, not least the need for temporary segregated areas (TSAs) in which to train, the need to conduct "air policing" and transit within and across Europe. Training areas are typically close to military aerodromes and there are some examples of cross-border areas. The "Flexible Use of Airspace" concept aims to ensure that when military airspace is not required then it is made available to civilian flights.

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ANNEX III
OVERVIEW OF SES LEGISLATION

1 OVERVIEW

The European Commission initiated the SES framework in 2000, after severe delays to flights in Europe in 1999. The main objective was to reform air traffic management (ATM) in Europe to cope with a sustained air traffic growth and provide the services under the safest, more cost- and flight-efficient and environmentally friendly conditions. This implied de-fragmenting the European airspace, reducing delays, increasing safety standards, improving the performance of air navigation services and flight efficiency.

The development towards a European Single Sky has taken place through two consecutive regulatory packages, SES I and SES II.

1.1 SES I

The legislative package adopted in 2004 comprised four basic regulations, which reinforced safety and fostered the restructuring of European airspace and air navigation services.

1. **The Framework Regulation** (EC No 549/2004) - laying down the framework for the creation of the Single European Sky;
2. **The Service Provision Regulation** (EC No 550/2004) - on the provision of air navigation services in the Single European Sky;
3. **The Airspace Regulation** (EC No 551/2004) - on the organisation and use of airspace in the Single European Sky;
4. **The Interoperability Regulation** (EC No 552/2004) - on the interoperability of the European Air Traffic Management network.

The four regulations are described in more detail in chapter 2 of this Annex.

This framework is supplemented by more than 20 Implementing Rules and Community Specifications ("technical standards") adopted by the European Commission, starting from 2005, as indicated on the Figure below. These implementing tools deal with interoperability of technologies and systems, Flexible Use of Airspace, establishment of the performance scheme, the charging scheme, Air Traffic Control Office licensing, the management and operation of the network etc.

Key achievements of the first SES package include:

- A legal and institutional framework for the Single Sky, including the establishment of the Single Sky Committee and Industry Consultation Body
- Functional separation of service provision from regulation, by means of the establishment of National Supervisory Authorities
- Harmonisation in licensing of controllers
- Transparency of charges
- Advances in the efficient use of airspace, through the concept of flexible use of airspace
- Stimulation of innovation via the SESAR programme.

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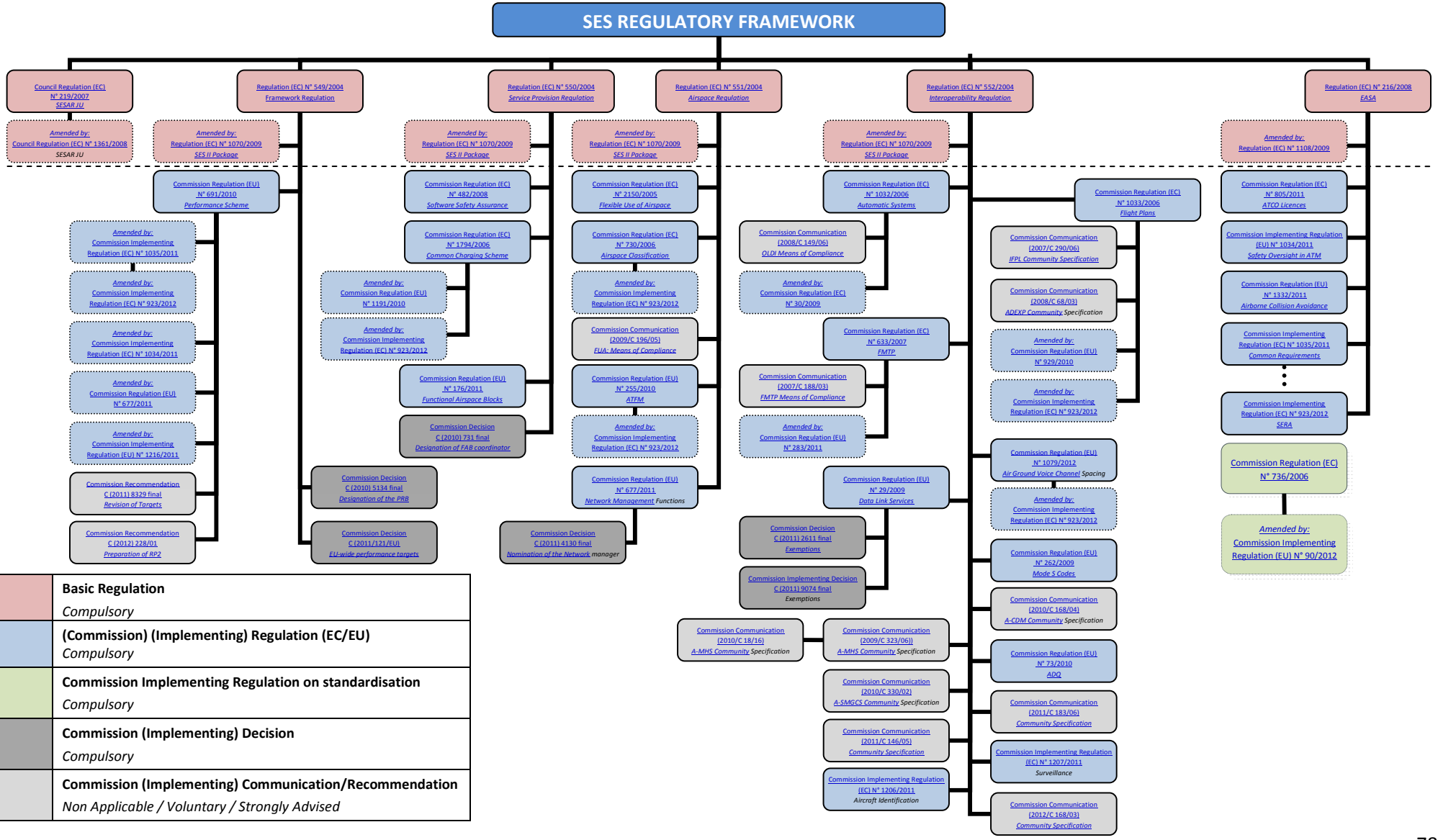
SES REGULATORY FRAMEWORK
Council Regulation (EC) N° 219/2007 SESAR JU
Amended by: Council Regulation (EC) N° 1361/2008 SESAR JU
Regulation (EC) N° 549/2004 Framework Regulation
Amended by: Regulation (EC) N° 1070/2009 SES II Package
Commission Regulation (EU) N° 691/2010 Performance Scheme
Amended by: Commission Implementing Regulation (EC) N° 1035/2011
Amended by: Commission Implementing Regulation (EC) N° 923/2012
Amended by: Commission Implementing Regulation (EC) N° 1034/2011
Amended by: Commission Regulation (EU) N° 677/2011
Amended by: Commission Implementing Regulation (EU) N° 1216/2011
Commission Recommendation C (2011) 8329 final Revision of Targets
Commission Recommendation C (2012) 228/01 Preparation of RP2
Commission Decision C (2010) 5134 final Designation of the PRB
Commission Decision C (2011/121/EU) EU-wide performance targets
Regulation (EC) N° 550/2004 Service Provision Regulation
Amended by: Regulation (EC) N° 1070/2009 SES II Package
Commission Regulation (EC) N° 482/2008 Software Safety Assurance
Commission Regulation (EC) N° 1794/2006 Common Charging Scheme
Amended by: Commission Regulation (EU) N° 1191/2010
Amended by: Commission Implementing Regulation (EC) N° 923/2012
Commission Regulation (EU) N° 176/2011 Functional Airspace Blocks
Commission Decision C (2010) 731 final Designation of FAB coordinator
Regulation (EC) N° 551/2004 Airspace Regulation
Amended by: Regulation (EC) N° 1070/2009 SES II Package
Commission Regulation (EC) N° 2150/2005 Flexible Use of Airspace
Commission Regulation (EC) N° 730/2006 Airspace Classification
Amended by: Commission Implementing Regulation (EC) N° 923/2012
Commission Communication (2009/C 196/05) FUA: Means of Compliance
Commission Regulation (EU) N° 255/2010 ATFM
Amended by: Commission Implementing Regulation (EC) N° 923/2012
Commission Regulation (EU) N° 677/2011 Network Management Functions
Commission Decision C (2011) 4130 final Nomination of the Network manager
Regulation (EC) N° 552/2004 Interoperability Regulation
Amended by: Regulation (EC) N° 1070/2009 SES II Package
Commission Regulation (EC) N° 1032/2006 Automatic Systems
Commission Communication (2008/C 149/06) OLDI Means of Compliance
Amended by: Commission Regulation (EC) N° 30/2009
Commission Regulation (EC) N° 633/2007 FMTP
Commission Communication (2007/C 188/03) FMTP Means of Compliance
Amended by: Commission Regulation (EU) N° 283/2011
Commission Regulation (EU) N° 29/2009 Data Link Services
Commission Decision C (2011) 2611 final Exemptions
Commission Implementing Decision C (2011) 9074 final Exemptions
Commission Communication (2010/C 18/16) A-MHS Community Specification
Commission Communication (2009/C 323/06)) A-MHS Community Specification
Commission Communication (2010/C 330/02) A-SMGCS Community Specification
Commission Communication (2011/C 146/05) Community Specification
Commission Implementing Regulation (EC) N° 1206/2011 Aircraft Identification
Commission Regulation (EC) N° 1033/2006 Flight Plans
Commission Communication (2007/C 290/06) IFPL Community Specification
Commission Communication (2008/C 68/03) ADEXP Community Specification
Amended by: Commission Regulation (EU) N° 929/2010
Amended by: Commission Implementing Regulation (EC) N° 923/2012
Commission Regulation (EU) N° 1079/2012 Air Ground Voice Channel Spacing
Amended by: Commission Implementing Regulation (EC) N° 923/2012
Commission Regulation (EU) N° 262/2009 Mode S Codes
Commission Communication (2010/C 168/04) A-CDM Community Specification
Commission Regulation (EU) N° 73/2010 ADQ
Commission Communication (2011/C 183/06) Community Specification
Commission Implementing Regulation (EC) N° 1207/2011 Surveillance
Commission Communication (2012/C 168/03) Community Specification
Regulation (EC) N° 216/2008 EASA
Amended by: Regulation (EC) N° 1108/2009
Commission Regulation (EC) N° 805/2011 ATCO Licences
Commission Implementing Regulation (EU) N° 1034/2011 Safety Oversight in ATM
Commission Regulation (EU) N° 1332/2011 Airborne Collision Avoidance
Commission Implementing Regulation (EC) N° 1035/2011 Common Requirements
Commission Implementing Regulation (EC) N° 923/2012 SERA
Commission Regulation (EC) N° 736/2006
Amended by: Commission Implementing Regulation (EU) N° 90/2012
Basic Regulation
Compulsory
(Commission) (Implementing) Regulation (EC/EU)
Compulsory
Commission Implementing Regulation on standardisation
Compulsory
Commission (Implementing) Decision
Compulsory
Commission (Implementing) Communication/Recommendation
Non Applicable / Voluntary / Strongly Advised

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1.2 SES II

The four Regulations adopted in 2004 were revised and extended in 2009 with Regulation (EC) 1070/2009[119] aiming at increasing the overall performance of the ATM system in Europe (the SES II Package).

SES II proposed changes in four domains:

1.2.1 Regulating performance

The Commission proposes three measures under this pillar:

1. **Introducing the Performance Scheme[120]** to drive performance of the ATM system. This pillar included the establishment of the Performance Review Body (PRB), an independent performance review body, who monitors and assesses the performance of the system and proposes EU wide targets for delays, cost reduction and the shortening of routes. These objectives are then approved by the Commission and passed on to national supervisory authorities who organise consultations to agree binding national and regional objectives.

- **Facilitating the integration of service provision**: Functional airspace blocks (FABs) are bottom-up initiatives led by the States to be established by the end of 2012, as provided by the Service Provision Regulation. FABs aim at an enhanced cooperation between the air navigation service providers and the national supervisory authorities to de-fragment the airspace and obtain the operational efficiency gains through such strategies as common procurement, training and optimisation of air traffic controllers resources. The service provision Regulation (Regulation (EC) N° 550/2004) as amended by Regulation (EU) N° 1070/2009 defined criteria for FABs. The revision's aim was to turn the current initiatives for FABs into genuine instruments of regional integration to achieve performance targets.

- **Strengthening the network management function**. The Network Manager is a centralised function at EU level to carry out the management of the ATM network functions (airspace design, flow management) and management of scarce resources (transponder code allocations, radio frequencies) as defined in Commission Regulation (EU) N° 677/2011[121]. The Network Manager should complete the performance framework and comprises a range of tasks, including European route network design, slot coordination and allocation and management of the deployment of the Single European Sky ATM Research (SESAR) technologies. This function has been entrusted to Eurocontrol up to 2019.

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119 Regulation (EC) No 1070/2009 of the European Parliament and of the Council of 21 October 2009 amending Regulations (EC) No 549/2004, (EC) No 550/2004, (EC) No 551/2004 and (EC) No 552/2004 in order to improve the performance and sustainability of the European aviation system

120 Commission regulation (EU) No 691/2010 of 29 July 2010 laying down a performance scheme for air navigation services and network functions and amending Regulation (EC) No 2096/2005 laying down common requirements for the provision of air navigation services

121 Commission regulation (EU) No 677/2011 of 7 July 2011 laying down detailed rules for the implementation of air traffic management (ATM) network functions and amending Regulation (EU) No 691/2010

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1.2.2 A single safety framework

The Commission stressed that the growth in air traffic, the congestion of air space and aerodromes, as well as the use of new technologies justifies a common approach to the development and application of harmonised regulation in order to improve safety levels in air transport. Accordingly it was proposed to extend the competence of the European Aviation Safety Agency (EASA) to the remaining key safety fields: aerodromes, air traffic management and air navigation services.

1.2.3 Opening the door to new technologies

The Commission noted that the present air traffic control system had been pushed to its limits, working with obsolescent technologies and suffering from fragmentation. As a consequence, Europe had to accelerate the development of its control system by implementing SESAR in order to increase safety levels and traffic control capacity. In short, SESAR is dealing with the new generation European air traffic management system.

1.2.4 Managing capacity on the ground

The Commission insisted that investment is necessary to ensure that airport capacity remains aligned with air transport management capacity and to preserve the overall efficiency of the network. An Observatory, composed of Member States, relevant authorities and stakeholders, was established to exchange and monitor data and information on airport capacity as a whole, as well as to provide advice on the development and implementation of EU transport legislation.

1.2.5 Other changes

SES II addressed also:

- **Charging -** the Charging Regulation[122] on the en-route charging system laid down a legal framework of transparent reporting of en-route charges and costs' components of the Member States, and defined which costs may be charged. It also defined a legal base for financing, through the charging system, of the "Common Projects" in the context of the deployment of SESAR.
- **Eurocontrol -** an internal reform of Eurocontrol had to align the government structures of this organisation with the Single European Sky.

2 DETAILED DESCRIPTION OF KEY ELEMENTS

2.1 The creation of the Single European Sky

2.1.1 The Communication on the creation of the Single European Sky

The creation of the SES was initiated by the Communication on the creation of the Single European Sky[123]. This Communication aimed to lay outline principles for optimising air traffic

[122] Commission regulation (EU) No 1191/2010 of 16 December 2010 amending Regulation (EC) No 1794/2006 laying down a common charging scheme for air navigation services

[123] Communication from the Commission of 1 December 1999 to the Council and the European Parliament - The creation of the Single European Sky, COM(1999) 614 final

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management for the benefit of all airspace users, whether civil or military, airspace being a common asset which should be managed collectively regardless of national borders.

This requires not only joint technical and operational measures, but the collective management of airspace, which should permit a substantial reorganisation of its structures. In order to avoid any obstacles which may present themselves in the course of implementing SES, the Commission set up two specific working frameworks:

- dialogue will be opened with the two sides of industry, as they will be using and operating the single sky,
- a high-level group will be set up under the chairmanship of the Member of the Commission responsible for transport, bringing together those responsible for air traffic management in the Member States.

The following action was proposed:

- evaluating the performance of the European air traffic management systems
- developing the capacity of aeronautical infrastructure
- planning capacity
- developing incentives
- carrying out research and technological development
- standardising systems.

2.1.2 Framework for creation of the Single European Sky

The objective of the Framework Regulation[124] was to enhance safety standards and overall efficiency for general air traffic in Europe, to optimise capacity meeting the requirements of all airspace users and to minimise delays.

To that end it included the following main provisions:

- **National supervisory authorities -** EU countries must, jointly or individually, nominate or establish one or more bodies as their national supervisory authorities to perform the tasks assigned to such authorities. These authorities must be independent of air navigation service providers.

- **Single Sky Committee -** is established on the entry into force of this regulation to assist the Commission with management of the Single European Sky and make sure that due account is taken of the interests of all categories of users. It consists of two representatives of each EU country and is chaired by a representative of the Commission.
- **Military issues -** the EU countries adopted a general statement on military issues related to the Single European Sky. According to this, they will enhance civil/military cooperation to the extent deemed necessary by all EU countries concerned.

[124] Regulation (EC) No 549/2004 of the European Parliament and of the Council of 10 March 2004 laying down the framework for the creation of the Single European Sky

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- **Industry consultation body -** the industry consultation body advises the Commission on the implementation of the Single European Sky. It is made up of representatives of air navigation service providers, associations of airspace users, airport operators, the aviation manufacturing industry and professional staff representative bodies.
- **The expert group on social dimension –** brings together the ATM sector social partners to study and advice the Commission on the social dimension
- **Implementing rules -** Eurocontrol is involved in the development of implementing rules which fall within its remit, on the basis of mandates agreed by the Single Sky Committee.
- **Performance review -** the establishment of a performance scheme aims to improve the performance of air navigation services and network functions in the Single European Sky. It will consist of:
  - European-wide performance targets in the key areas of safety, environment, capacity and cost-efficiency;
  - national plans including performance targets to ensure consistency with the European-wide performance targets;
  - periodic review and monitoring of the performance of air navigation services and network functions.
- **Safeguards -** this regulation does not prevent EU countries from applying measures needed to safeguard essential security or defence policy interests.

2.1.3 Provision of air navigation services in the Single European Sky

To create the Single European Sky, measures are needed to ensure the safe and efficient provision of air navigation services consistent with the organisation and use of airspace. A harmonised framework needs to be established for the provision of such services in order to respond adequately to demand from airspace users and to regulate air traffic safely and efficiently. To that end the Service Provision Regulation[125] established common requirements to ensure that air navigation services are provided safely and efficiently, on a continuous and interoperable basis, throughout the EU. It introduced a harmonised system of certification and laid down rules for designating service providers.

In was established via following main provisions:

- **National supervisory authorities -** must ensure appropriate supervision of the application of the regulation, particularly with regard to the safe and efficient operation of air navigation service providers (public or private entities providing air navigation services) which provide services relating to the airspace falling under the responsibility of the European Union (EU) countries. Each national supervisory authority must organise proper inspections and surveys to check compliance with the regulation's requirements. The air navigation service provider concerned must facilitate this work. However, the national supervisory authorities may delegate the inspections and surveys to recognised organisations meeting certain requirements.

[125] Regulation (EC) No 550/2004 of the European Parliament and of the Council of 10 March 2004 on the provision of air navigation services in the Single European Sky

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- **Licensing of controllers -** once the regulation has entered into force, the Commission had to, if appropriate, present a proposal on the licensing of controllers to harmonise the licensing systems for controllers, increase the availability of controllers and promote mutual recognition of licences.
- **Common requirements** for the provision of air navigation services must include the following: technical and operational competence and suitability, systems and processes for safety and quality management, reporting systems, quality of services, financial strength, liability and insurance cover, ownership and organisational structure (including the prevention of conflicts of interest), security, and human resources (including adequate staffing plans).
- **Certification of air navigation service providers -** all provision of air navigation services within the EU is subject to certification by EU countries. Certificates must specify the rights and obligations of air navigation service providers, including compliance with the common requirements and non-discriminatory access to services for airspace users, with particular regard to safety.
- **Designation of air traffic service providers -** to ensure the provision of air traffic services on an exclusive basis within specific airspace blocks (airspace of specified dimensions within which air navigation services are provided) in respect of the airspace under their responsibility, EU countries must designate an air traffic service provider holding a valid certificate.
- **Functional airspace blocks -** EU countries must ensure the implementation of functional airspace blocks to reach the necessary capacity and efficiency of the air traffic management network within the Single European Sky, maintaining a high level of safety and a reduced environmental impact. Functional airspace blocks can only be established by mutual agreement from all EU countries and, where appropriate, non-EU countries responsible for any airspace included in the functional airspace block. To facilitate the implementation of the functional airspace blocks, the Commission may designate a functional airspace blocks system coordinator who will be responsible for overcoming any difficulties encountered in the negotiation stages, thereby speeding up the entire process.
- **Relations between service providers -** air navigation service providers may avail themselves of the services of other service providers that have been certified in the EU.
- **Transparency of accounts -** air navigation service providers must draw up, submit to audit and publish their financial accounts.
- **Access to and protection of data -** operational data (information relating to all flight phases) must be exchanged in real time between all air navigation service providers, airspace users and airports to facilitate their operational needs.
- **Charging schemes -** the charging scheme must be based on account of the air navigation service costs incurred by service providers for the benefit of airspace users. The following principles must be applied when establishing the cost-base for charges:
  - the cost to be shared among airspace users is the determined cost of providing air navigation services;
  - the costs to be taken into account in this context are those assessed in relation to the facilities and services provided for and implemented under the International Civil Aviation Organisation (ICAO) Regional Air Navigation Plan, European Region;

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- the cost of different air navigation services must be identified separately;
- cross-subsidy is not allowed between en-route services and terminal services. Cross-subsidy is only allowed between different air navigation services in the above categories when justified for objective reasons;
- transparency of the cost-base for charges must be guaranteed.

2.1.4 Air traffic management: Organisation and use of airspace in the Single European Sky

In order to ensure that the Single European Sky is an airspace without frontiers, the Commission proposed in the Airspace Regulation[126] on the organisation and management of airspace to set up a unique flight information region by merging all the national regions into a single portion of airspace within which air traffic services will be provided according to the same rules and procedures. This should help to optimise the use of European airspace, reduce delays and promote the growth of air transport. The key elements of the Airspace Regulation are described below.

European upper flight information region (EUIR)

Under the Chicago Convention, the concept of Flight Information regions (FIRs) defines homogenous regions of airspace, which should efficiently cover air route structures. Before air frontiers were fixed by reference to land and sea frontiers. Against this background, the International Civil Aviation Organisation (ICAO) recommended that the delineation of internal airspace should be related to the need for efficient service rather than to national boundaries.

Accordingly, the Single European Sky arrangements provided for a single European upper flight information region (EUIR). The EUIR encompasses the upper airspace falling under the responsibility of the EU countries and, where appropriate, will include adjacent airspace of European countries that are not EU members.

The creation of a single flight information region in upper airspace enabled this space to be reconfigured into delimited control areas without regard to national frontiers, thereby ensuring the more efficient use of airspace, systems and personnel.

To harmonise aeronautical information within the area of the EUIR, steps were taken to ensure the creation of a single source for the publication of such information, taking account of relevant ICAO requirements. The Commission is responsible for ensuring the development of an aeronautical information infrastructure in the form of an electronic integrated briefing portal with unrestricted access to interested stakeholders.

Network management and design

In order to support initiatives both on a national level and on the level of functional airspace blocks, the air traffic management network functions should allow optimum use of airspace and ensure that airspace users can operate preferred trajectories, while permitting maximum access to airspace and air navigation services.

Flexible use of airspace

[126] Regulation (EC) No 551/2004 of the European Parliament and of the Council of 10 March 2004 on the organisation and use of the airspace in the Single European Sky

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As regards the use of airspace for military purposes, the Commission recommended the adoption of criteria permitting the application, first of all in upper airspace and then in lower airspace, of the concept of flexible use of airspace, as devised by Eurocontrol. The Commission urged EU countries and Eurocontrol to take appropriate measures to ensure uniform application of the provisions governing civil-military air traffic service provision.

Coordination had to be increased between the civilian and military authorities, in particular for the allocation and efficient use of airspace for military purposes, including the criteria and principles which should govern allocation and use, and in particular access for civilian flights.

A safeguard clause had to enable EU countries to request the suspension of the application of the EU rules in the event of conflict with national military requirements.

2.1.5 Interoperability of the European air traffic management network

Differences between national technical specifications used for tenders has led to fragmentation of the market and systems and make industrial cooperation at EU level more difficult.

The aim of the Interoperability Regulation[127] was to define common requirements to guarantee interoperability between the various air traffic management systems used:

- to achieve interoperability between the different systems, constituents and associated procedures in the European air traffic management network;
- to ensure the introduction of new agreed and validated concepts of operations and technology in air traffic management.

According to the Interoperability Regulation, the European air traffic management network, its systems and their constituents must meet **essential requirements**. These are of two kinds:

- *general requirements*: seamless operation, support for new concepts of operation, safety, civil/military coordination, environmental constraints, principles governing the logical architecture of systems and principles governing the construction of systems;
- *specific requirements*: systems and procedures for airspace management, systems and procedures for air traffic flow management, systems and procedures for air traffic services, communications systems and procedures for ground-to-ground, air-to-ground and air-to-air communications, navigation procedures, surveillance systems and procedures, systems and procedures for aeronautical information services and for the use of meteorological information.

The implementing rules for interoperability had to:

- determine any specific requirements, in particular in terms of safety;
- describe, where appropriate, any specific requirements, in particular regarding the coordinated introduction of new concepts of operation;
- describe the specific conformity assessment procedures involving notified bodies to be used to assess the conformity or suitability for use of constituents, as well as for the verification of systems;

[127] Regulation (EC) No 552/2004 of the European Parliament and of the Council of 10 March 2004 on the interoperability of the European Air Traffic Management network

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- specify the conditions of implementation including, where appropriate, the date by which all relevant stakeholders are required to comply with them.

Community specifications could be:

- European standards for systems or constituents, together with the relevant procedures, drawn up by the European standardisation bodies; or
- specifications drawn up by Eurocontrol on matters of operational coordination between air navigation service providers.

Constituents must be accompanied by a **European Community (EC) declaration of conformity** or suitability for use. Before a system is put into service, the relevant air navigation service provider must establish an EC declaration of verification, confirming compliance, and must submit it to the national supervisory authority together with a technical file.

Safeguards

Where the national supervisory authority ascertains that a constituent or a system accompanied by an EC declaration of conformity/verification does not comply with the essential requirements for interoperability, it must restrict the application of the constituent or prohibit its use. The EU country concerned must immediately inform the Commission of any such measures, indicating the reasons for it.

Where the Commission establishes that the measures taken by the supervisory authority are not justified, it can request the EU country concerned to ensure that they are withdrawn without delay.

2.2 A joint undertaking to develop the new generation European air traffic management system (SESAR)

The SESAR Regulation[128] created a joint undertaking to ensure modernisation of the European air traffic management system. The joint undertaking brought together EU research and development efforts within the framework of the SESAR (Single European Sky Air Traffic Management (ATM) Research) project.

The rationale behind the SESAR initiative was that the current air traffic control systems were close to becoming obsolete and were ill-suited for the rapid, economic and reliable development of aviation in Europe. SESAR is the technological pillar of the SES and an essential enabler for its implementation. SESAR was planned in three phases:

- a **definition phase** (2005-2007), in which the air traffic modernisation plan (or "ATM Master Plan") has been developed to define the different technological stages, priorities and timetables;
- a **development phase** (2007-2016), consisting of research, development and validation activites relating to the new technologies and procedures which will underpin the new generation of systems;

[128] Council regulation 219/2007 of the Council, of 27 February 2007, on the establishment of a Joint Undertaking to develop the new generation European air traffic management system (SESAR)

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- a **deployment phase** (2014-2020), which will see the large-scale production and implementation of the new technologies and procedures.

The SESAR joint undertaking: activities, statutes and financing

It constitutes a public-private partnership, where the EU and Eurocontrol are founding members, that makes it possible to rationalise and coordinate ATM R&D efforts throughout the EU in a deployment oriented approach. The joint undertaking allows leveraging and pooling funding and know-how and reducing fragmentation created by similar national and regional projects and harnessing the skills and innovation capacity of the private sector within appropriate risk sharing arrangements with public entities.

The SESAR joint undertaking is responsible for:

- organising and coordinating development of the SESAR project, in accordance with the ATM Master Plan;
- funding the necessary activities, by combining and managing public and private funds;
- implementing and updating the ATM Master Plan;
- organising the technical research and development, validation and study work to be carried out while avoiding its fragmentation;
- ensuring project involvement by stakeholders from the air traffic management sector (service providers, users, professional organisations, airports, manufacturers, as well as the scientific community and institutions);
- supervising the activities to develop common products identified in the ATM Master Plan and, if necessary, launching specific invitations to tender.

The SESAR joint undertaking, based in Brussels, is an EU body with a legal personality and is being financed by contributions from its members, including private firms. The EU's contribution comes from the budgets of the framework programmes for research and development and the trans-European networks

2.3 Air traffic flow management

The Air Traffic Flow Regulation[129] supplemented the existing SES legislation on air traffic management and aimed to optimise the available capacity of the European air traffic management network as well as to enhance the air traffic flow management processes through the uniform application of specific rules and procedures within the airspace of the Single European Sky.

This regulation applied within the **airspace of the Single European Sky** as laid out in Regulation No 551/2004 and affected:

- all flights intended to operate or operating as general air traffic and in accordance with the instrument flight rules;

[129] Commission regulation (EU) No 255/2010 of 25 March 2010 laying down common rules on air traffic flow management

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- air traffic management.

This regulation applies to the following parties involved in **air traffic flow management (ATFM) processes**:

- operators of aircraft;
- air traffic service (ATS) units;
- aeronautical information services;
- entities involved in airspace management;
- airport managing bodies;
- central unit for air traffic flow management (ATFM);
- local ATFM units;
- slot coordinators of coordinated airports.

The planning, coordination and execution of the ATFM measures undertaken by the above-mentioned parties must be in accordance with the provisions laid out by the International Civil Aviation Organisation (ICAO).

The main provisions of the regulations are described below.

General obligations of European Union (EU) countries

EU countries had to ensure that the ATFM function is constantly available to the above list of parties involved in the ATFM processes. EU countries had to also ensure that the definition and implementation of ATFM measures complies with national security and defence requirements of individual EU countries.

General obligations of ATS units

When applying an ATFM measure, ATS units had to coordinate through the local ATFM unit with the central unit for ATFM to ensure that the measure is selected with regard to the optimisation of the overall performance effects on the EATMN.

ATS units had to inform the central unit for ATFM of all events that may affect air traffic control capacity or air traffic demand. ATS units had to also provide the central unit for ATFM with various information and subsequent updates, including:

- availability of airspace and route structures;
- air traffic control sector and airport capacities;
- route availability;
- deviations from flight plans;
- airspace availability.

The full list of data must be made available to the above list of parties involved in ATFM processes and provided free of charge to, and by, the central unit for ATFM.

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General obligations of operators

Any relevant ATFM measures and changes to filed flight plans had to be included in the planned flight operation and the pilot had to be notified. When a flight plan is suspended because the ATFM departure slot cannot be met, the operator concerned had to arrange for updating or cancelling the flight plan.

Consistency between flight plans and airport slots

EU countries had to ensure that, on request by an airport slot coordinator or managing body of a coordinated airport, the central unit for ATFM or the local ATFM unit provides them with the agreed flight plan of a flight operating at that airport, prior to the flight taking place.

Obligations concerning critical events

EU countries had to ensure the creation and publication of ATFM procedures for the management of critical events to minimise disruption to the EATMN**.** To prepare for critical events, ATS units and airport managing bodies will coordinate the contingency **procedures** with the operators affected by such critical events.

Monitoring of compliance with ATFM measures

EU countries had to ensure that airports adhere to ATFM departure slots and where the adherence is 80% or less during a year, the ATS units at the airport concerned had to detail the actions taken to ensure future adherence. The ATS unit at an airport is also responsible for providing the appropriate information on any failure to adhere to flight plan rejections or suspensions at that airport and to detail the actions taken to ensure future compliance.

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ANNEX IV
CONSULTATION OF STAKEHOLDERS

OVERVIEW OF THE STAKEHOLDER CONSULTATION

Stakeholder consultation process consisted of several elements, including bilateral meetings, discussions in forums (such as the European Economic and Social Committee, Social Dialogue, IATA Operations panel etc), public consultation and interviews with some key stakeholders.

1 LIST OF STAKEHOLDERS CONSULTED THROUGHOUT THE CONSULTATION PROCESS

Firstly, the following organizations/persons responded to the public consultation:

- Representative bodies at European level including: Air navigation service providers (ANSP) (18), airlines (3), airport operators (3), manufacturing industry (2), other civil airspace users (4), representative and/or professional associations (15), trade unions (12) and miscellaneous respondents (9)[130].
- National Supervisory Authorities (9): CAA Belgium, CAA UK, BAF DE, DGAC France, ENAC IT
- Member States: Ministries (6) and military (2)

Secondly, the within the framework of the impact assessment (IA) support study, 26 persons representing certain key stakeholders, were interviewed:

Organisation
Association of European Airlines
Bundesaufsichtsamt für Flugsicherung DE
CAA Belgium
CAA UK
CANSO
DFS Germany
DGAC France
DSNA France
ENAC IT
European Aviation Safety Agency
European Transport Workers'

130 These included: AEA (Association of European Airlines), ETF (European Transport Workers' Federation), CANSO (Civil Air Navigation Services Organisation), DFS (Deutsche Flugsicherung), DSNA France (Direction des services de la navigation aérienne), HIAL UK (Highland and Islands Airports Limited), IFATSEA (International Federation of Air Traffic Safety Electronics Associations), IATA (International Air Transport Association), IFATCA (International Federation of Air Traffic Controllers' Associations), LFV Sweden, NATS UK, NAV Canada

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Organisation
Federation
HIAL UK
IFATSEA
International Air Transport Association
International Federation of Air Traffic Controllers' Associations
LFV Sweden
NATO
NATS UK
NAV Canada
Performance Review Board
Performance Review Unit
SESAR Joint Undertaking

The answers of the interviews are incorporated into the IA support study and have thus informed the Commission while preparing their analysis in the IA report.

Thirdly, on 21 January 2013, a public hearing on SES II+ was organised by the European Economic and Social Committee. Participation at the public hearing was open to all interested stakeholders, who were also able to present their questions and comments to different speakers. The latter included[131]:

- Airline representatives (Brussels Airlines, Ryanair)
- Defence community (European Defence Agency)
- Service providers (Italian Air Navigation Service Provider)
- Trade unions (European Transport Workers` Federation)
- Public sector (German Ministry of Transport, Polish Ministry of Transport, Belgian National Supervisory Authority)
- Airports Council International Europe
- European Aviation Safety Agency
- SESAR Joint Undertaking.

The Commission took note of the debate from all the sides.

Note on the discussion can be found at the end of this Annex.

[131] Presentations are accessible on: http://www.eesc.europa.eu/?i=portal.en.events-and-activities-single-eu-sky-ii-presentation

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2 THE PUBLIC CONSULTATION

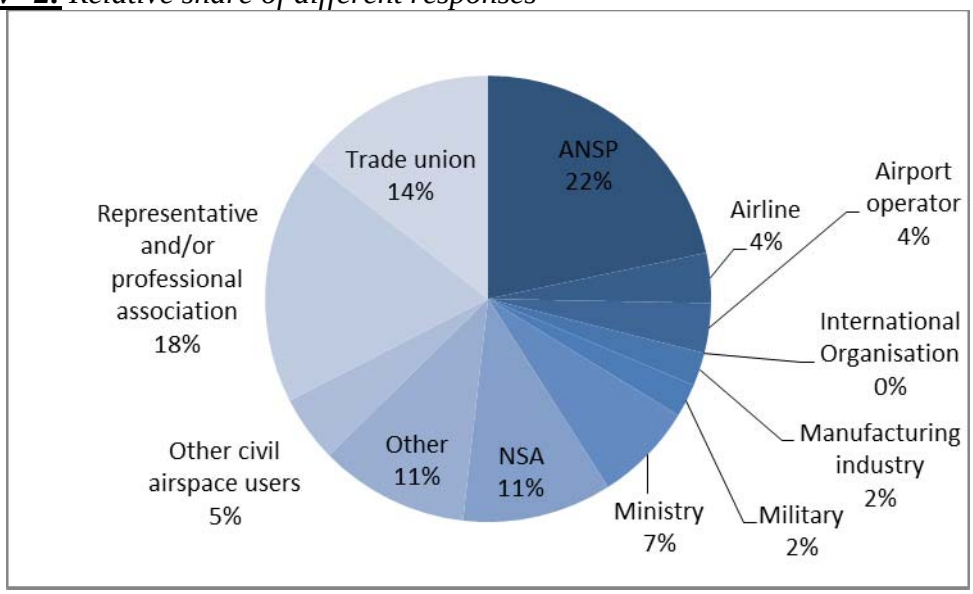
A public consultation was launched by the European Commission on 21 September 2012 in the form of an electronic questionnaire, with both multiple choice and open questions. Questionnaires had to be returned by 13 December 2012 – overall duration 12 weeks.

2.1 Coverage

A total of 83 responses were been received, representing all stakeholder groups, though the views of the service providers have to some extent prevailing weight (22% of respondents). Closely followed the representative and/or professional organisations (18%) and trade unions (14%). Other stakeholder categories were represented to a limited extent.

Figure IV- 1: *Breakdown of respondents by stakeholder group*

Figure IV- 2: *Relative share of different responses*



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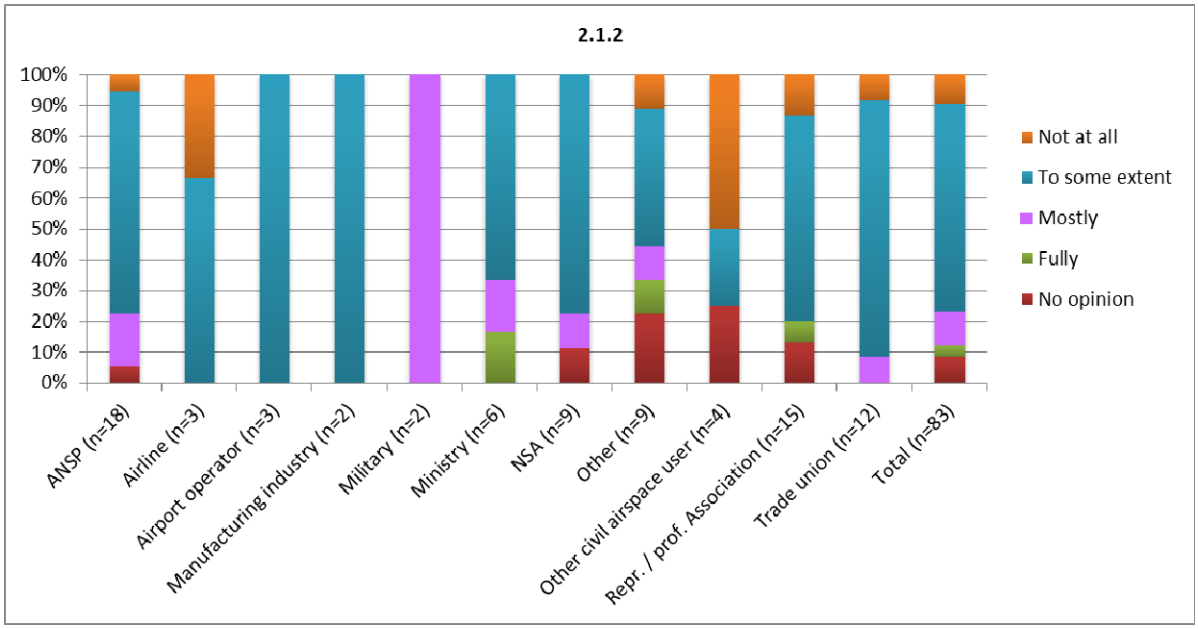
2.2 Results of the public consultation

The analysis below gives an overview of the replies to the questions which were posed to stakeholders during the public consultation. It has to be noted, that these differ to some extent from the intervention framework presented in the Commission IA. This is due to the fact that the Commission thinking has evolved throughout the policy preparation process, including the adjustments made according to the results of the stakeholder consultations.

2.2.1 Stakeholder views on problems

Figure IV- 3: *To which extent are the objectives of the Single European Sky initiative to improve the efficiency in organisation and management of the European airspace already achieved?*



Less than 5% of stakeholders report that the objectives of the Single European Sky initiative are fully met (mostly these ministries and some representative and/or professional associations). The majority of stakeholders, about 70%, believes the objectives are met to some extent. The airlines and the other civil airspace users are the least positive about the effects of SES, with a large percentage of stakeholders reporting the objectives have not been achieved at all.

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Figure IV- 4: *Indication on which policy area(s) in particular the objectives are not met.*

Number of responses (absolute)	ANSP	Airline	Air operator	Manuf. industry	Military	Ministry	NSA	Other	Other civil space user	Repr/prof. association	Trade union	Total
Performance Scheme	7	2	2	2	0	3	4	4	2	6	2	**34**
Functional Airspace Blocks	8	3	2	1	0	3	4	6	2	6	1	**36**
Organisation and use of airspace	8	3	1	1	2	5	6	5	3	8	2	**44**
Charging scheme	0	0	0	0	2	0	0	0	0	0	0	**2**
SESAR	1	0	1	0	0	2	0	0	0	5	7	**16**
Safety and security requirements	2	0	1	1	2	2	2	1	1	11	12	**35**
Other	9	0	0	0	0	0	0	1	0	1	1	**12**
Network manager	2	1	0	0	0	1	1	2	0	0	0	**7**
Interoperability	12	2	1	0	0	3	4	6	3	10	8	**49**
Human factor	9	2	0	1	2	3	2	2	1	11	10	**43**
Total	**58**	**13**	**8**	**6**	**8**	**22**	**23**	**27**	**12**	**58**	**43**	**278**

According to the service providers, the objectives are not met in most of the policy areas, except for the charging scheme, SESAR, safety/security and the network manager. This opinion is mostly shared by the representative and/or professional association and trade unions, who however remain concerned also about safety/ and security requirements. Most stakeholders report that the objectives in interoperability, human factor and organisation/use of airspace have not been met.

The service providers indicated that there is still work required in a number of policy areas in order to fully achieve the SES objectives, but much of this can be achieved through the reinforcement of existing regulations rather than creating more rules. The project of SES was perceived still too bureaucratic.

Another concern of the service providers is that the FABs still need a stronger institutional framework and common management system. Airlines also report that FABs do not comply with the legal obligations and are not delivering the expected benefits.

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Figure IV- 5: *Indication on which policy area of the Single European Sky initiative it is considered necessary that further work is being done:*

Number of responses (absolute)	ANSP	Airline	Air operator	Manuf. industry	Military	Ministry	NSA	Other	Other civil space user	Repr/prof. association	Trade union	Total
Performance Scheme	13	2	2	2	0	3	3	4	1	7	3	**40**
Functional Airspace Blocks	1	0	0	0	0	0	1	1	2	1	0	**6**
Organisation and use of airspace	8	3	1	2	0	2	4	5	2	8	2	**37**
Airports	8	2	1	1	2	3	5	3	2	7	2	**36**
Charging scheme	0	0	1	0	2	0	1	0	0	0	0	**4**
SESAR	2	0	0	0	0	2	2	0	0	5	7	**18**
Safety and security requirements	6	2	0	1	0	0	0	1	1	12	11	**34**
Other	9	2	0	1	0	1	0	0	0	5	1	**19**
Network manager	1	1	0	0	0	1	1	2	0	0	1	**7**
Interoperability	11	2	1	2	0	2	4	6	2	12	9	**51**
Human factor	8	2	0	1	0	2	3	3	1	13	11	**44**
Total	**67**	**16**	**6**	**10**	**4**	**16**	**24**	**25**	**11**	**70**	**47**	**296**

According to the service providers, further work should most importantly be done in the area of the performance scheme, organisation and use of the airspace, airports, interoperability, the human factor and "other areas". Representative and/or professional associations and trade unions put a larger emphasis on the safety and security requirements.

Service providers added that there are several overlaps and gaps in the legislative framework, which have emerged as a result of the aggregation of the different SES initiatives. Therefore a harmonization and recast of legislation is expected. In case of the performance scheme, stakeholders stressed necessity to respect the expert views of all stakeholders in setting the targets (which should be achievable, simple and realistic) as well as in evaluating the performance.

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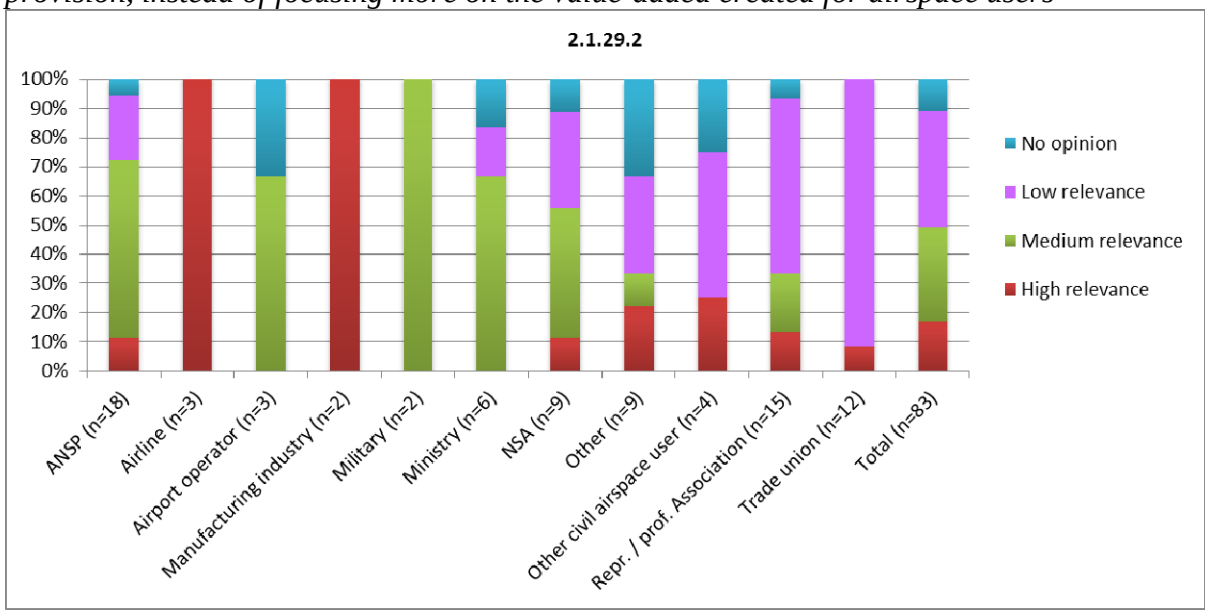
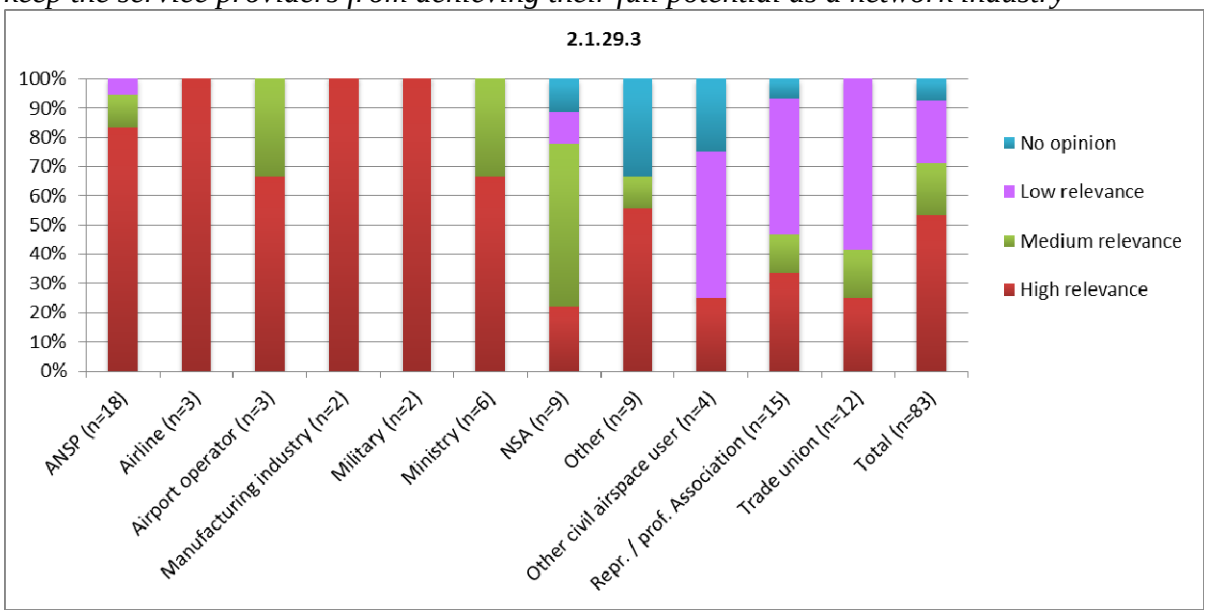
Figure IV- 6: *There is still a tendency to support maintaining the status quo in service provision, instead of focusing more on the value-added created for airspace users*



Stakeholder opinions on this statement ere widely divided. Some, like trade unions and professional associations perceive this as being of low relevance, while the service providers perceive this as being of medium relevance. The airlines and the manufacturing industries perceive this issue as highly relevant.

Figure IV- 7: *Increased co-operation to seek synergies between the service providers is needed to bring benefits to airspace users both inside and outside FABs. Working in isolation would keep the service providers from achieving their full potential as a network industry*



A bit more than half of stakeholders believe this to be of high relevance. Most of these stakeholders are the service providers. The NSAs report this issue being of medium relevance.

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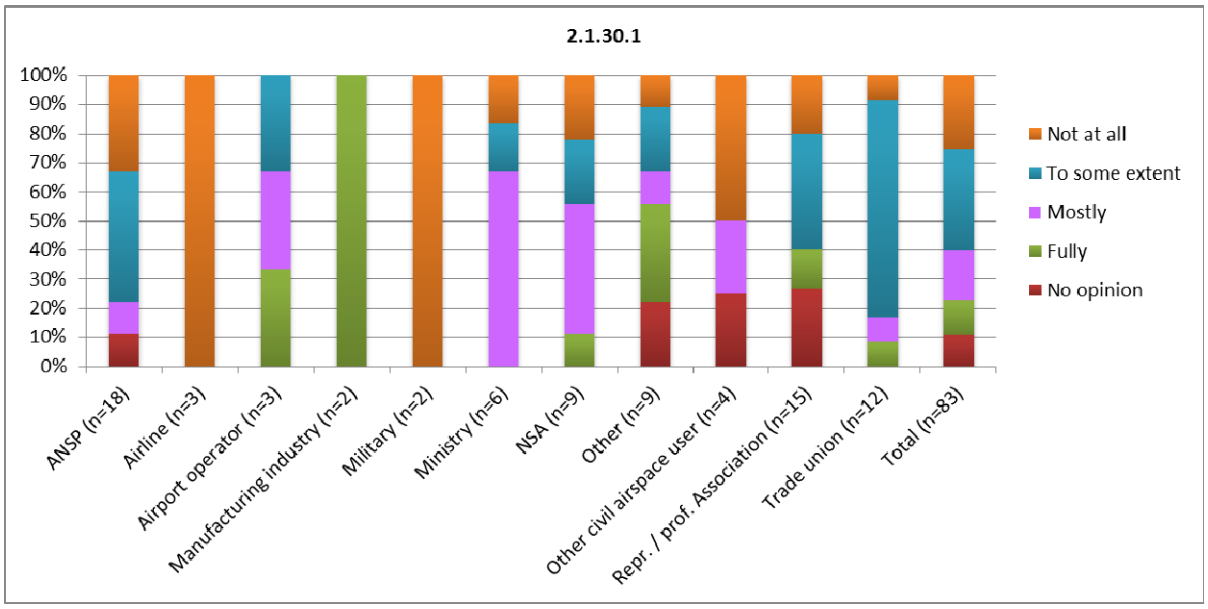
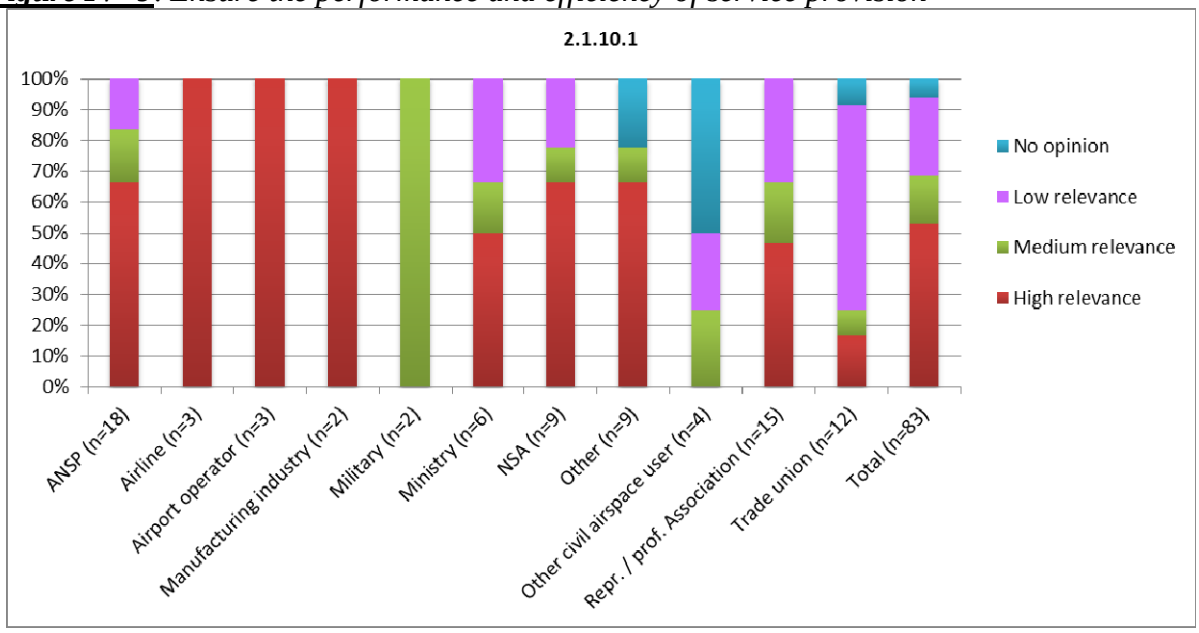
Figure IV- 8: *Due to the current economic crisis, the National Supervisory Authorities (NSAs) do not have the required resources to efficiently oversee the service providers and enforce SES rules*



Only a small number of stakeholders fully agree with this statement (the airport operators, manufacturing industries). NSAs themselves mostly agree with this statement. Within the larger groups of service providers, professional associations and trade unions, stakeholders believe this is true to some extent. The airlines and militaries find this statement being not true.

2.2.2 Stakeholder views on policy objectives

Figure IV- 9: *Ensure the performance and efficiency of service provision*



The performance and efficiency of service provision is of high relevance for half of stakeholders. These are the service providers, airlines, airport operators and manufacturing industries. About 20% of stakeholders report this of low relevance; most of these are trade unions, representative and/or professional associations and ministries.

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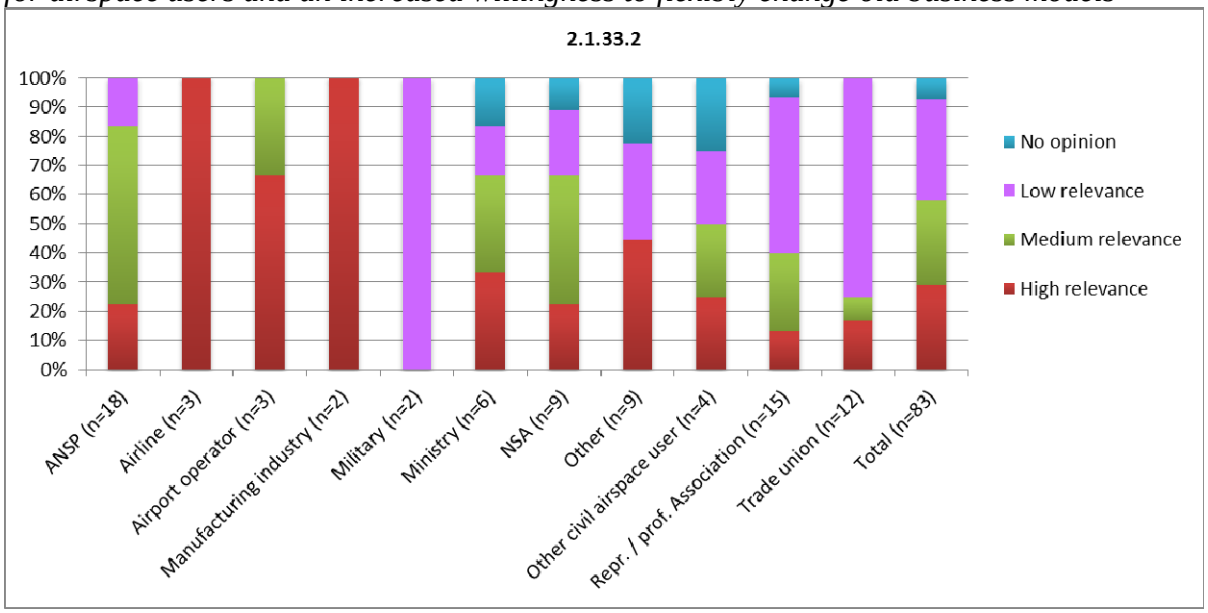
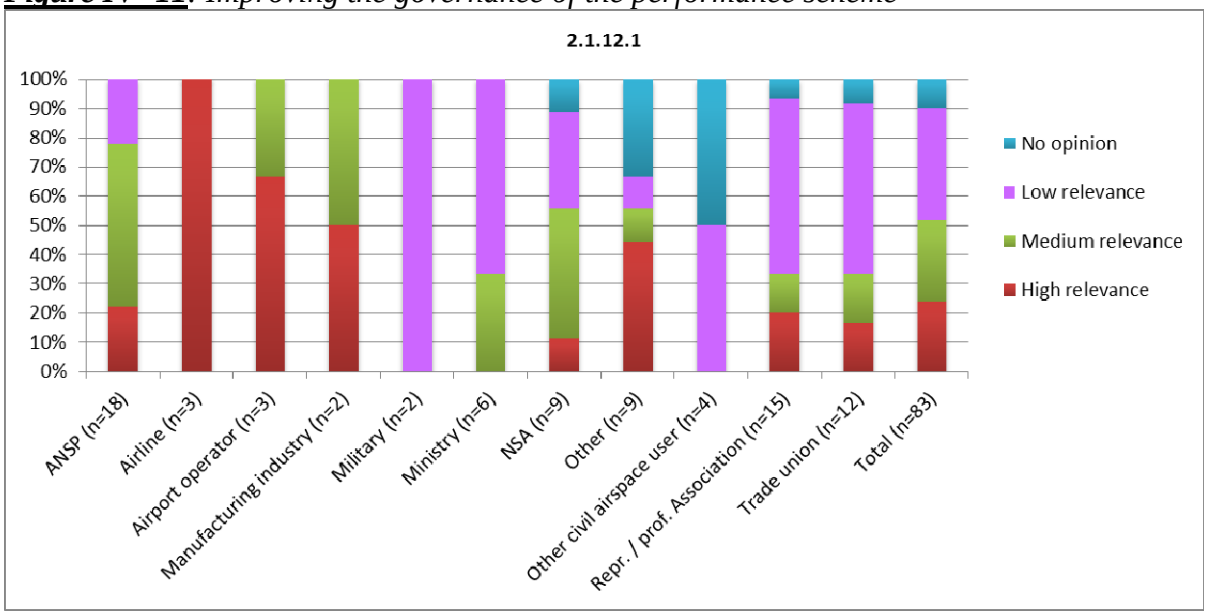
Figure IV- 10: *Optimisation of service provision requires an increased focus on value added for airspace users and an increased willingness to flexibly change old business models*



30% of the total stakeholders believe this to be of high relevance (mostly the airlines, airport operators and manufacturing industries). About 25% believe this to be of medium relevance (mostly the service providers, and half of the NSAs).

Figure IV- 11: *Improving the governance of the performance scheme*



About a half of stakeholders agree with the objective of improving the governance of the performance scheme, although about 40% (many representative and/or professional associations, trade unions and all military and other civil airspace users) think that this not a relevant objective. At the same time all operators (airlines, industry and airports) find this objective very relevant.

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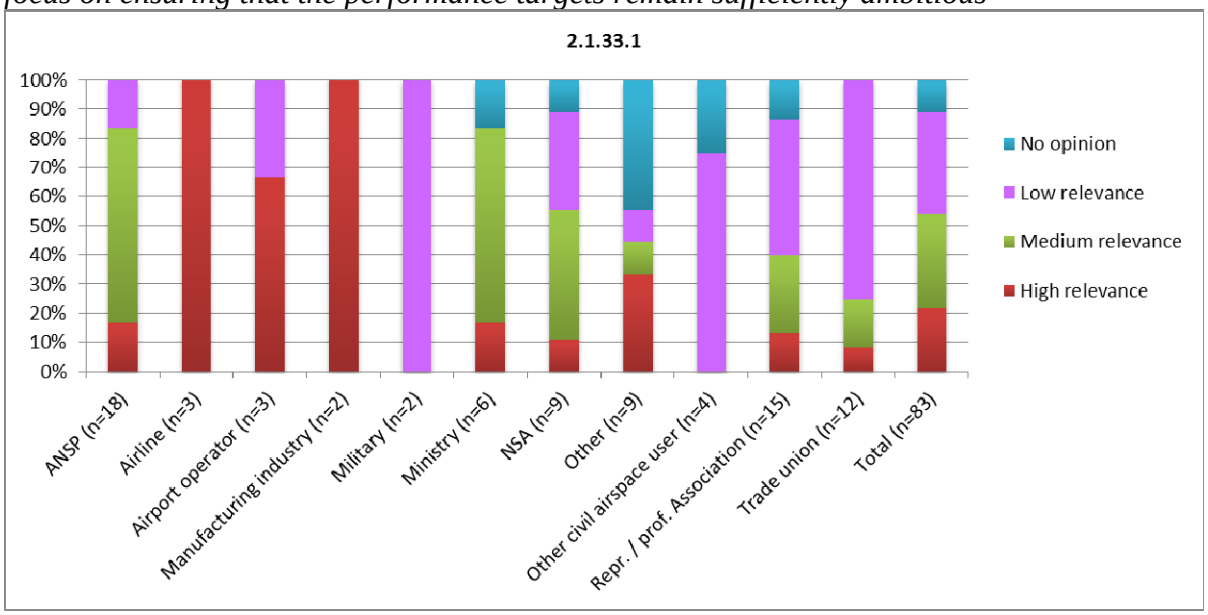
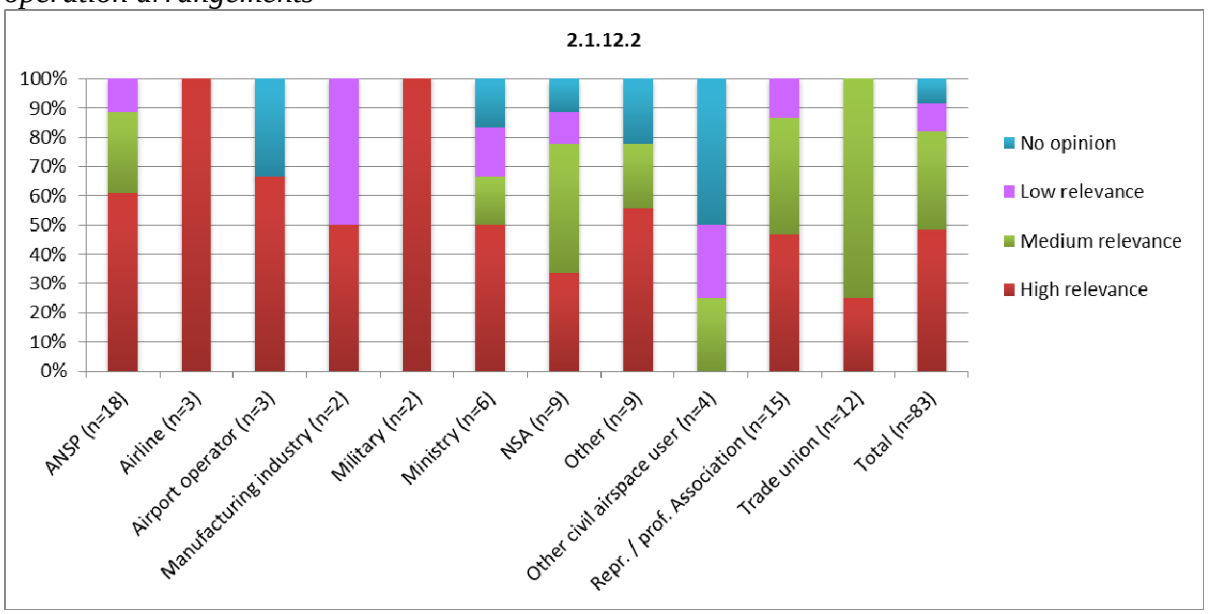
Figure IV- 12: *Increasing the competitiveness of the air transport system requires continuous focus on ensuring that the performance targets remain sufficiently ambitious*



On this question, the opinions are quite different. 20% of the total stakeholders believe this to be of high relevance (mostly the airlines, airport operators and manufacturing industries). About 30% believe this to be of medium relevance (mostly the service providers and half of the NSAs).

Figure IV- 13: *Improving the functionality of functional airspace blocks and other co-operation arrangements*



The majority of stakeholders perceive this objective as highly relevant or medium relevant. Only 10% of the total respondents believe the objective is of low relevance, which are mostly the other civil airspace users, the military and a small share of the representative and/or professional associations.

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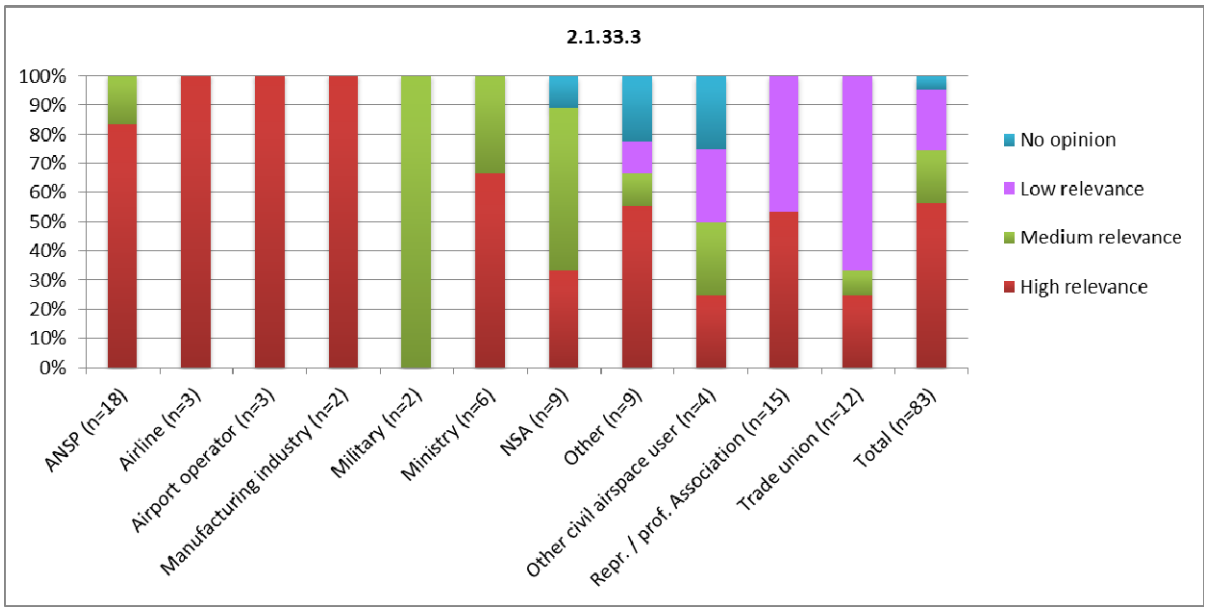
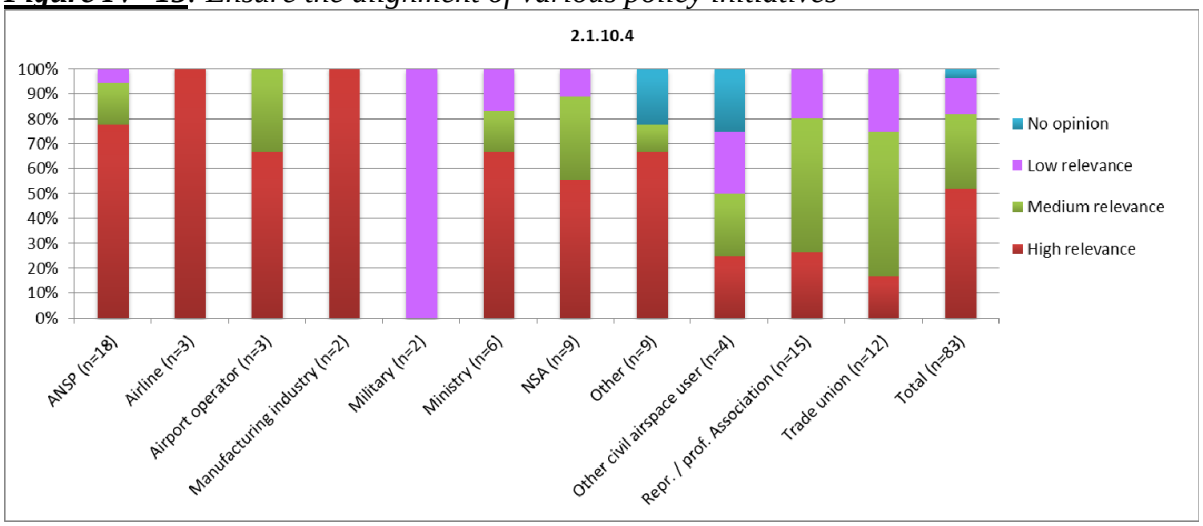
Figure IV- 14: *The FABs should be increasingly focused on functionality and flexible search for synergies, instead of rigid structures to ensure new efficiencies and economies can be realised*



The majority of stakeholders stated this to be of high relevance (service providers, the majority of the professional associations and some of the smaller stakeholder groups). The majority of trade unions also perceive this of low relevance.

Figure IV- 15: *Ensure the alignment of various policy initiatives*



Half of stakeholders perceive the alignment of various policy initiatives as highly relevant.

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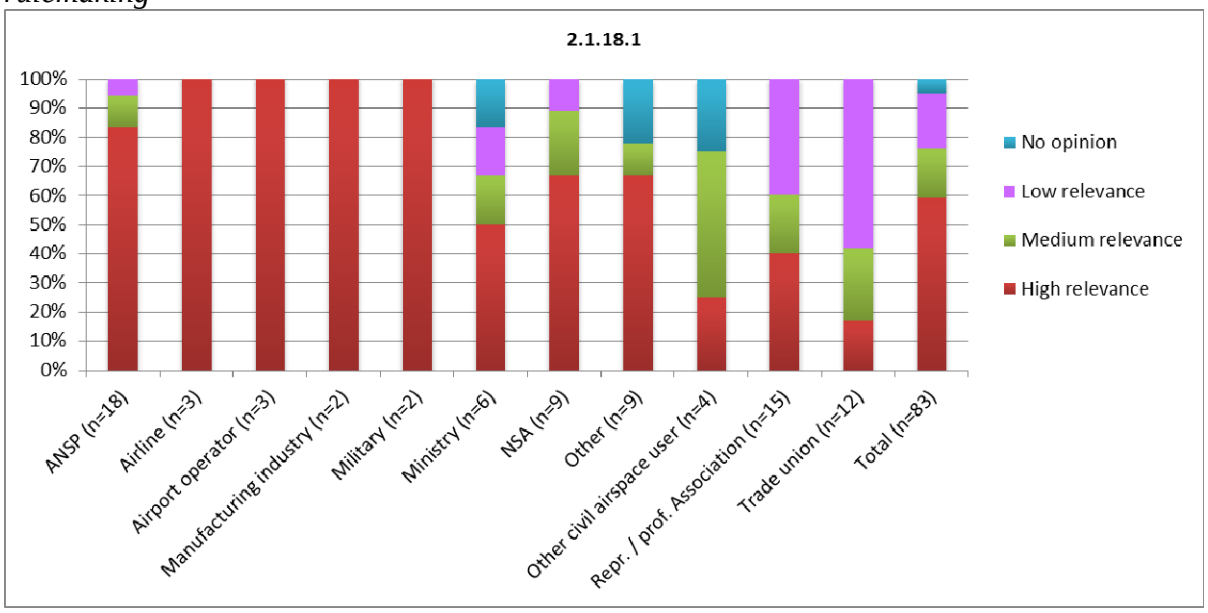
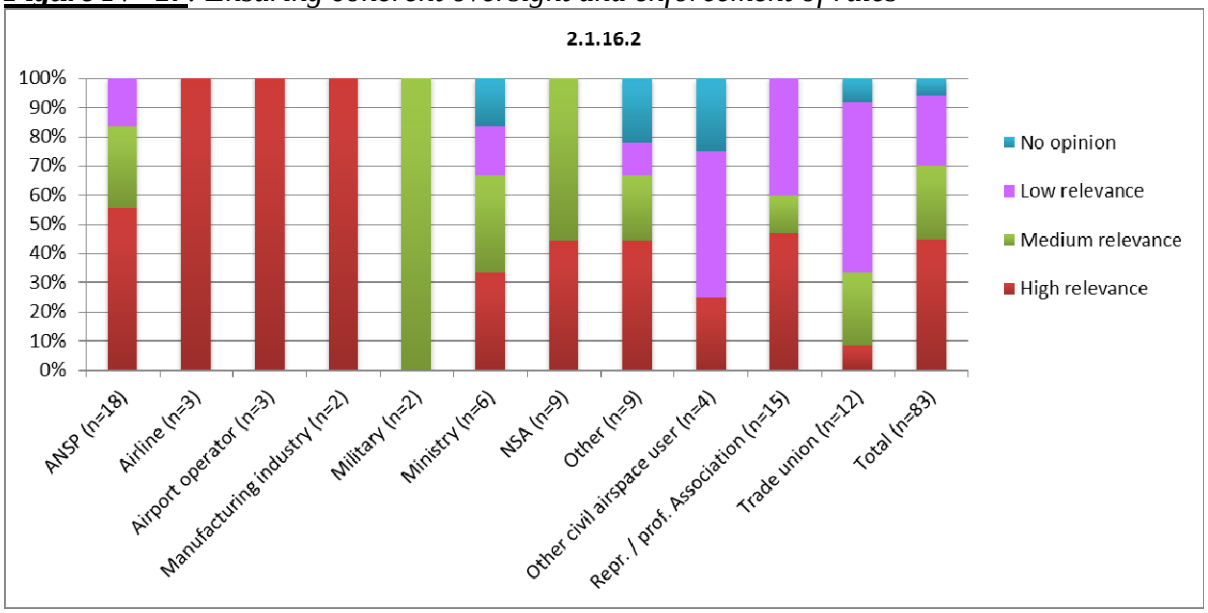
Figure IV- 16: *Clarifying the roles of the various involved organisations in European ATM rulemaking*



The majority of stakeholders, about 60%, believe clarifying the roles of the various involved organisations is of high relevance, though trade unions and representative and/or professional associations find it less pertinent.

Figure IV- 17: *Ensuring coherent oversight and enforcement of rules*



About 45% of respondents indicate that enforcement and follow up are of high relevance in the SES policy. These are mostly the airlines, airport operators and manufacturing industry. On the other hand, the professional associations, trade unions and the other civil airspace users find this objective being of low relevance.

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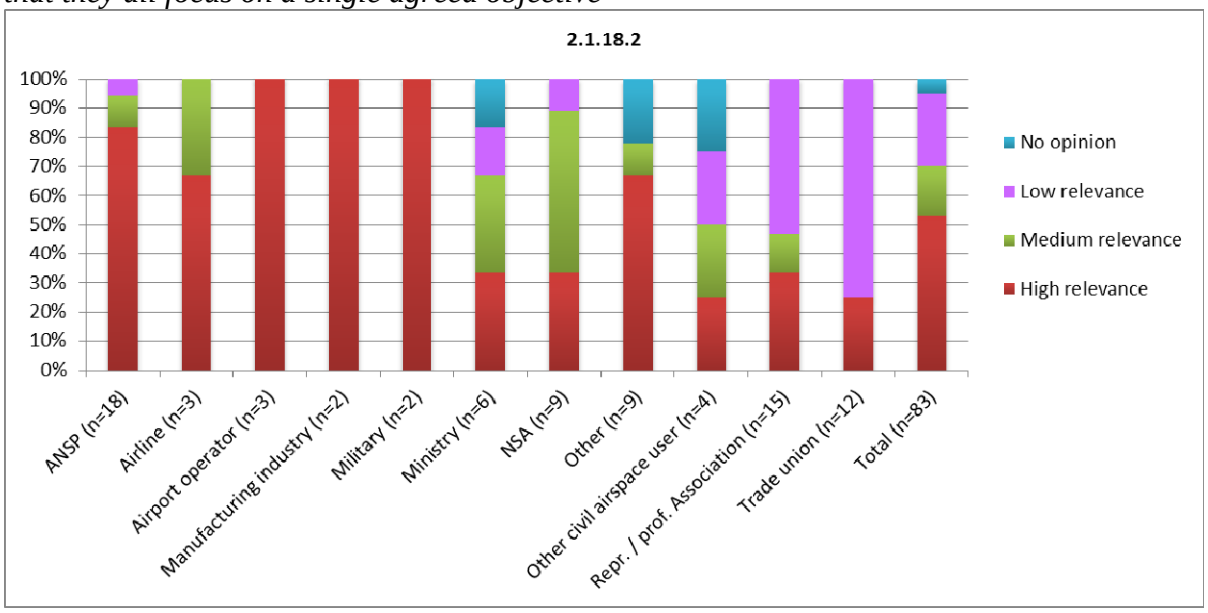
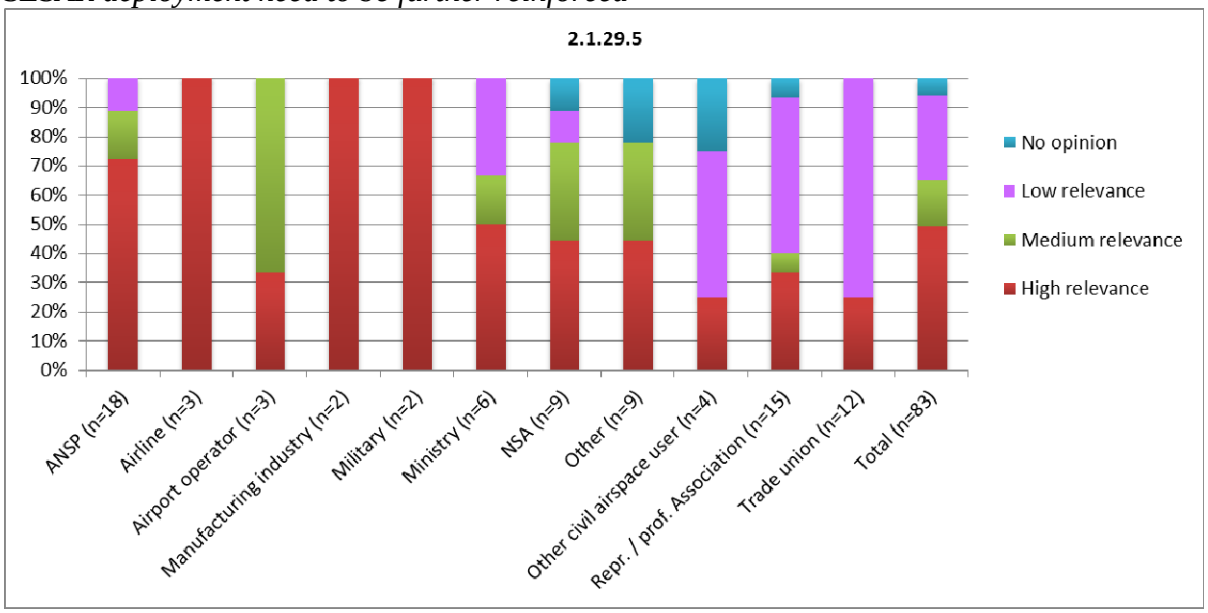
Figure IV- 18*: Ensuring their policies are decided through a single planning framework and that they all focus on a single agreed objective*



Again the majority of stakeholders reported this of high relevance. The small mid-group perceiving the medium relevance consists of mostly of the ministries and the NSAs.

Figure IV- 19*: Links between the performance scheme, the FABs, the Network Manager and SESAR deployment need to be further reinforced*



About half of stakeholder perceives this objective as of high relevance (service providers and the smaller groups of stakeholders) while again representative and/or professional associations and trade unions do not always share this view.

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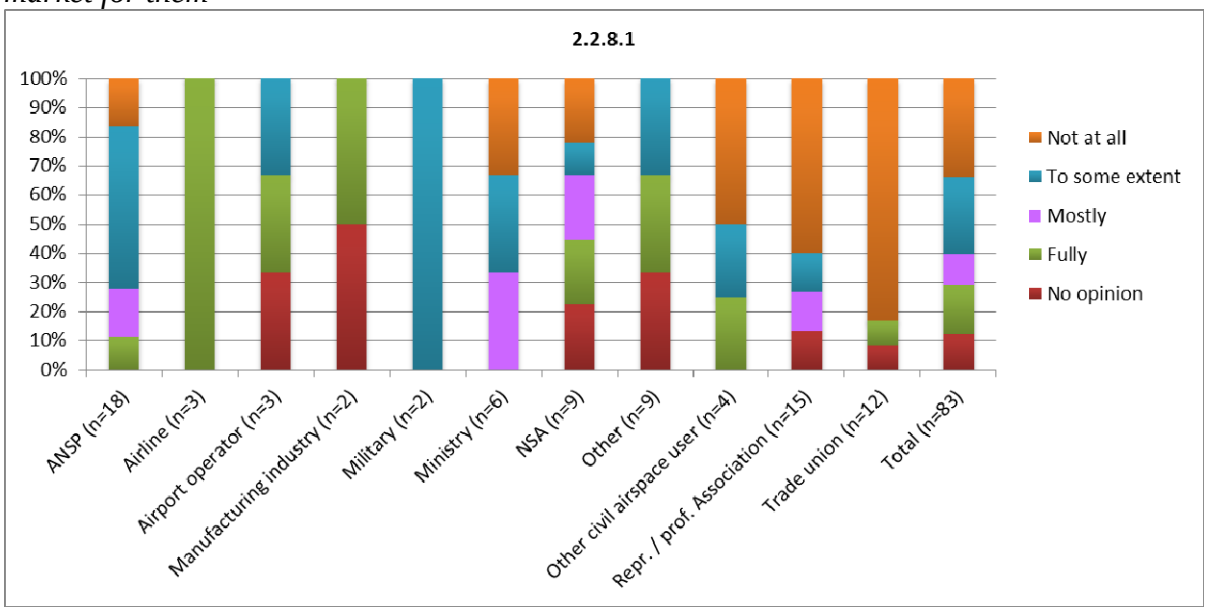
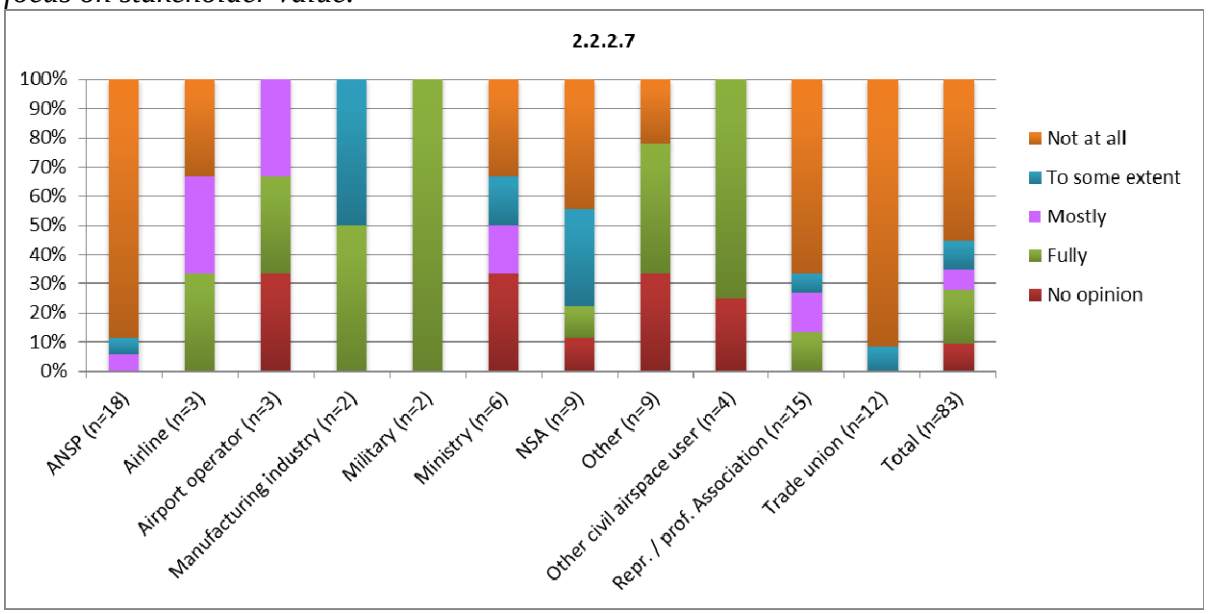
2.2.3 Stakeholder views on possible policy options

Figure IV- 20: *Unbundle support services from the core bundled ANSPs and opening up the market for them*



The majority of trade unions and representative and/or professional associations, but also some ministries, civil airspace users and ANSPs do not agree at all, which is 30% of the total stakeholders. The majority of the ANSPs agree to some extent. For other stakeholder groups views are dispersed, while overall only about 20% agree fully (including all airlines). An interesting split in States position is witnessed with ministries being equally split amongst the choices, but NSAs exhibiting a preference for at least some unbundling.

Figure IV- 21: *More involvement of all airspace user groups in ANSP governance to ensure focus on stakeholder value.*



A large share of stakeholders believes that involving all airspace users in ANSP governance is not a good idea. These are in particular stakeholders from the ANSPs, the representative and/or professional associations and trade unions. The military, other civil airspace users and the manufacturing industries agree fully with this proposal, but this is only 15% of the total stakeholders. Interestingly the airlines – who have given most anecdotal evidence of lacking

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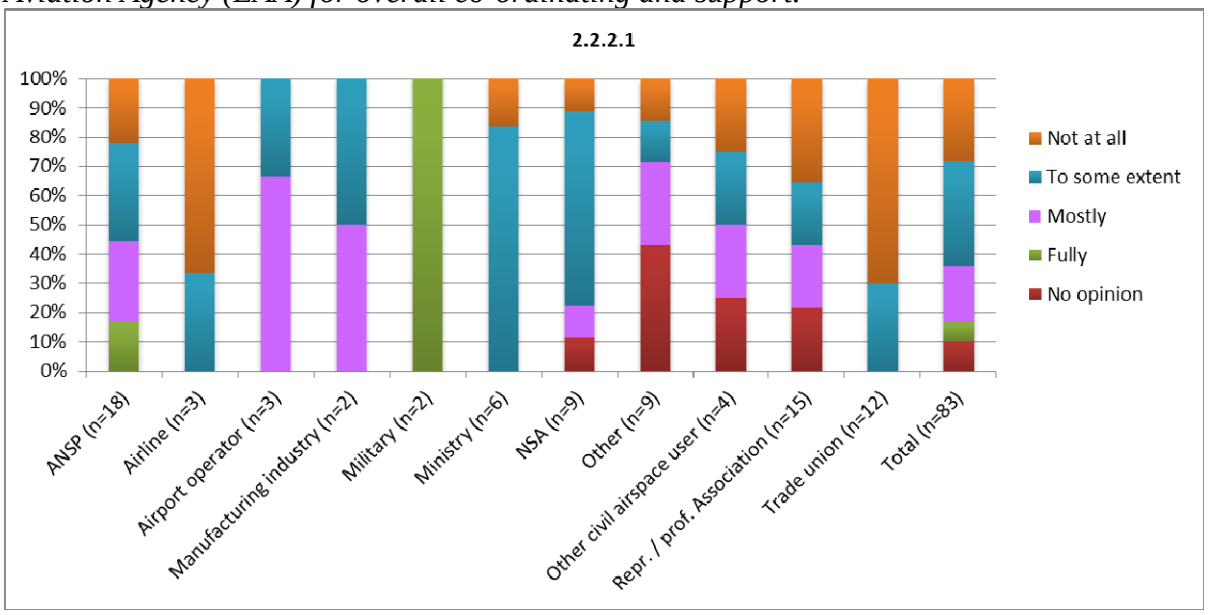
influence – are evenly split, with a third of them opposing all additional airspace user involvement in the ANSPs governance. This could reflect the difficulty of operators in allocating necessary resources for participation.

Figure IV- 22: *Strengthen the role and organizational independence of National Supervisory Authorities. Possibly by improving co-operation between the NSAs or going to the European Aviation Agency (EAA) for overall co-ordinating and support.*



Only 5% of stakeholders fully agree with an extended co-ordinating role of new EAA, this being primarily some ANSPs and the military respondents. Another 15% mostly agree, which is spread out over all stakeholder groups. Trade unions are most negative, while representative and/or professional associations, ministries, but also airlines are not very convinced about further need for centralisation either.

Note: In analysing these responses it should be noted that the public consultation was formulated at a relatively early stage and its responses and the subsequent interviews – in particular for this *question – have helped to reformulate and modify the policy options. Therefore the creation of a European Aviation Authority (EAA) is no longer even assessed, instead EASA's role will be streamline along the lines of the principles put in place during SES development.*

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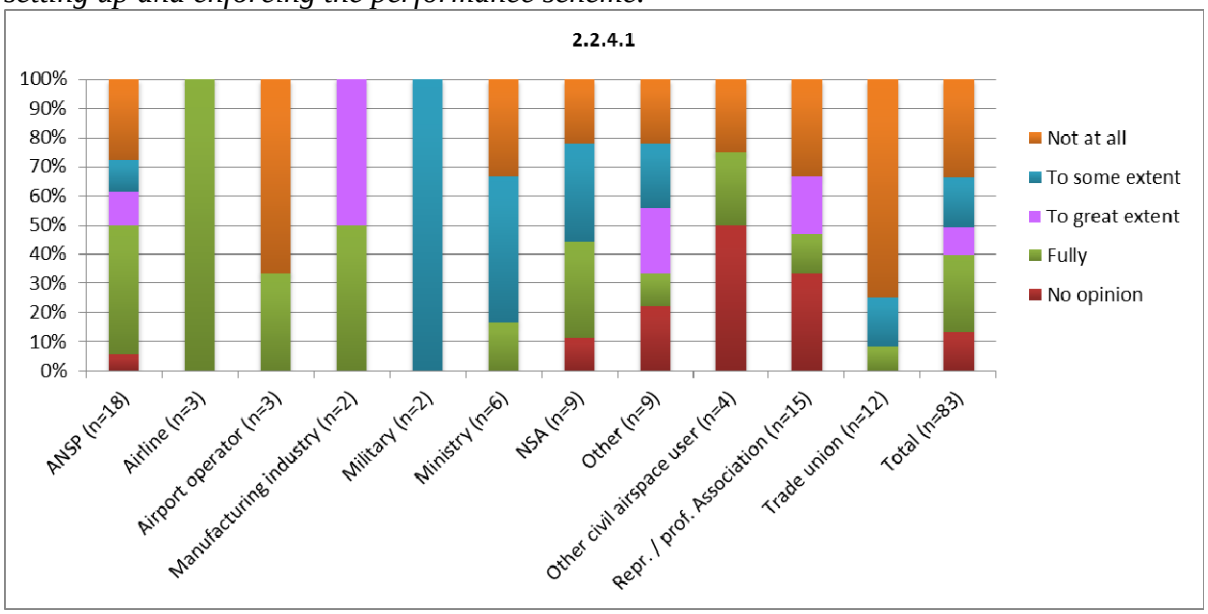
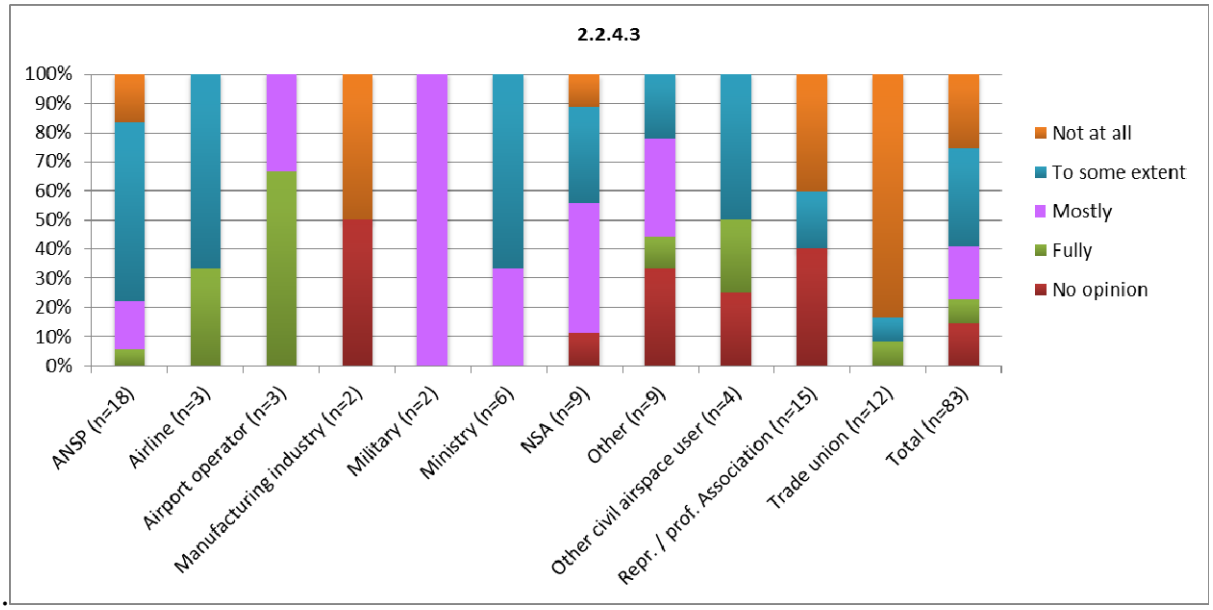
Figure IV- 23: *Give the Performance Review Body a more independent and important role in setting up and enforcing the performance scheme.*



25% of stakeholders (mainly airlines and ANSPs) report that the PRB should have a more independent role. On the other hand, more than 30% of stakeholders (mostly trade unions) indicate PRB status should not be changed. The views of other stakeholders are spread.

Figure IV- 24: *The timescale of the current performance target setting process is too long and problematic for implementation of the scheme?*



Trade unions strongly disagree, professional associations also are not favourable, while the views of other stakeholder groups vary. Only about a quarter of stakeholders "fully" or "mostly" agree. About 30% of stakeholder agree "to some extent". This is mostly the opinion of ANSPs, airlines and ministries. It is particularly interesting to note that of the Member State's ministries, which are central to target setting, none disagree totally with the proposal and even amongst the NSAs almost 90% agree either fully or to some extent with this statement.

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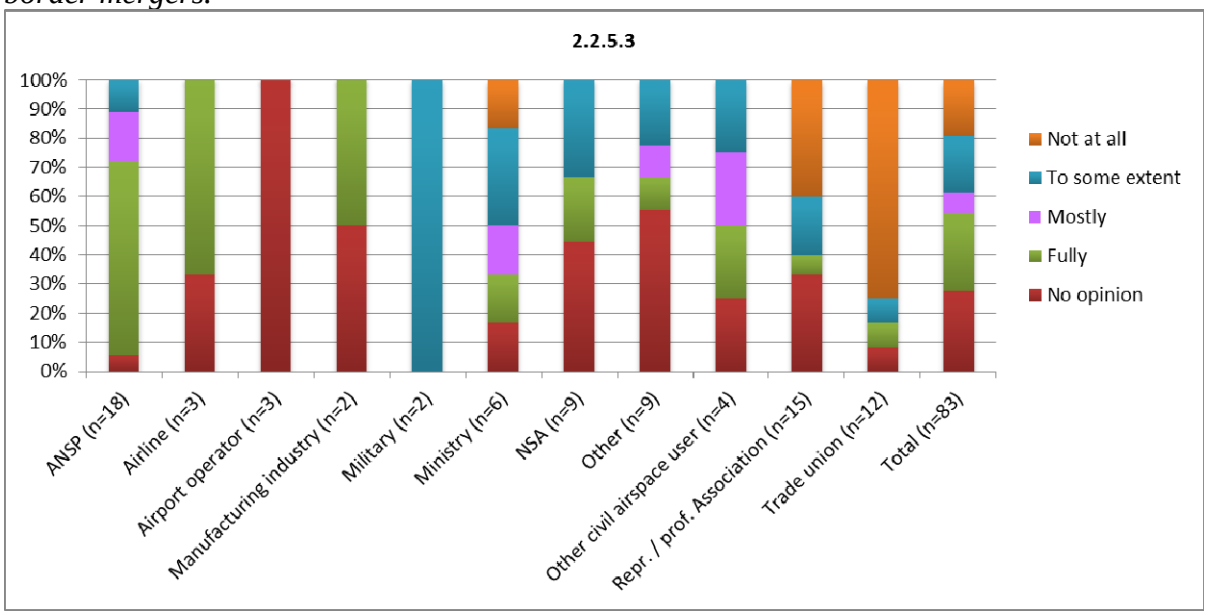
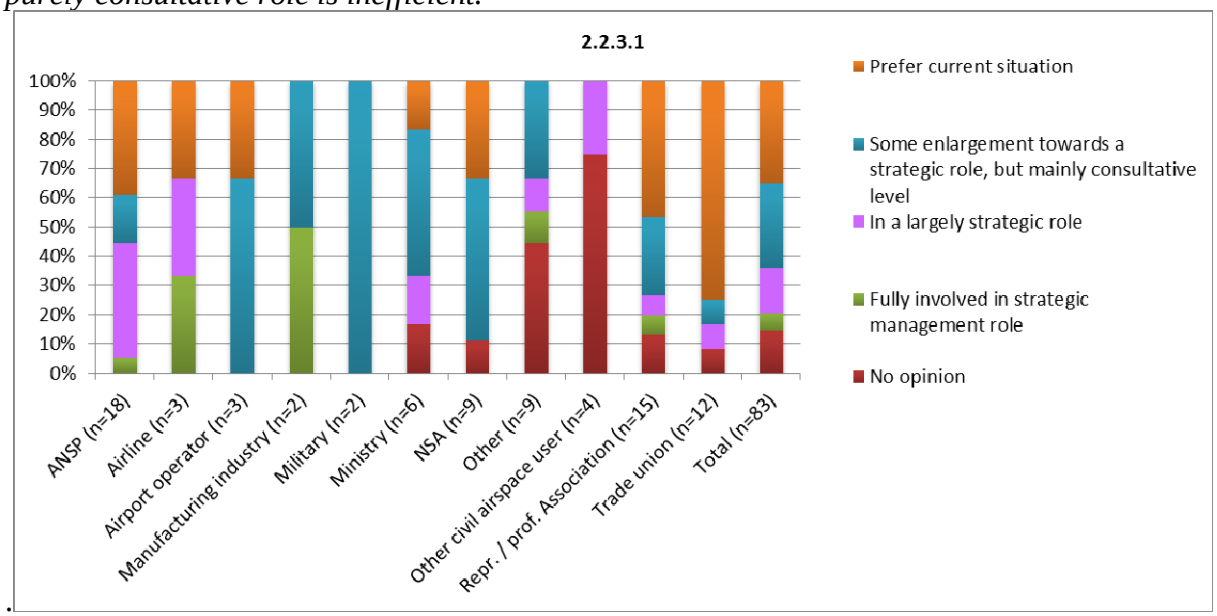
Figure IV- 25: *In order to revitalize the FAB initiative we could allow more industry led cooperation at service provider level through different forms like flexible alliances and cross-border mergers.*



The ANSPs fully agree with this proposal whereas trade unions do not agree at all, just like half of the representative and/or professional associations. A large percentage of stakeholders (30%) do not have an opinion.

Figure IV- 26: *Airspace users should be given a strategic management role in the Network Manager e.g. on network co-ordination, planning and allocation. The current situation of a purely consultative role is inefficient.*



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Trade unions and representative and/or professional associations prefer the current situation, as well 40% of the ANSPs. This counts for more than 30% of total stakeholders. Another 30% (mostly NSAs) indicates that there can be some extension of industry involvement, but mainly on a consultative level. The ANSPs form the largest share of stakeholders who believe that users could be given a more strategic role. Majority of airspace users of course supports an extension of their role towards stronger strategic partner of the Network Manager, but even

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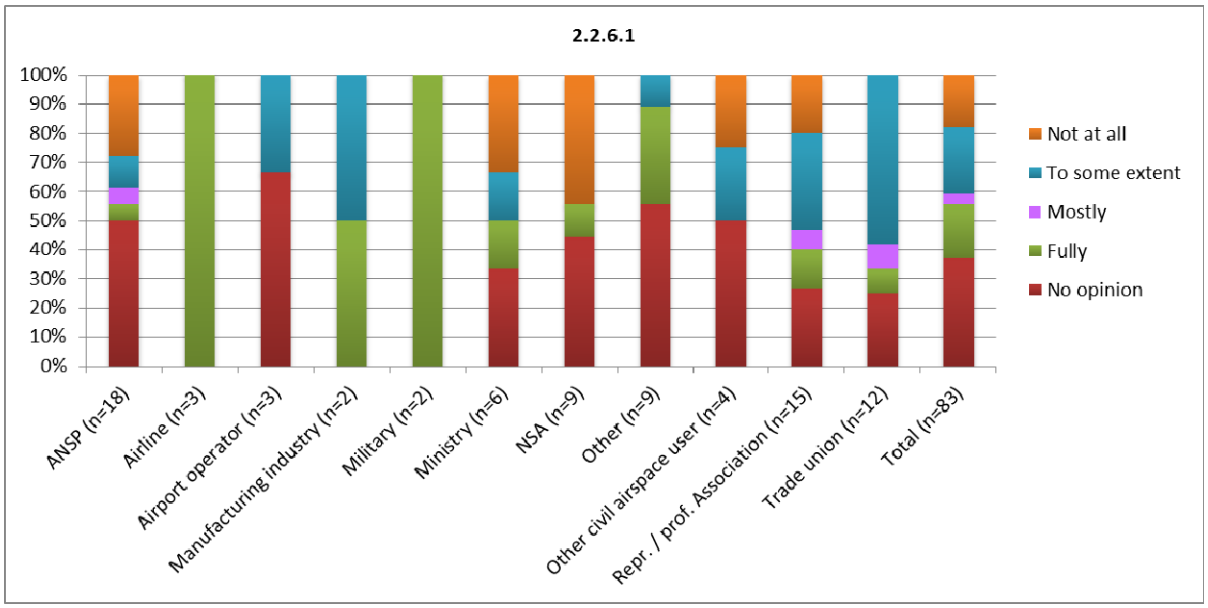
amongst them a third prefers the current situation, perhaps reflecting the difficulty of allocating resources to support the participation.

Note: The following two questions do not form part of the impact assessment as they are determined by previous *policy choices in SES II, or by the necessity for adapting the text to Icelandic membership. However they are included here for the sake of completeness of this overview.*

Figure IV- 27*: Extend selected parts of the SES legislation also to the parts of ICAO North Atlantic (NAT) region that are under the responsibility of SES States.*[132]



Almost 40% of stakeholders do not have an opinion on this matter. This is half of the ANSPs, half of the NSAs and a small number of stakeholders in the other categories. Only airlines and military fully agree. This outcome was expected, given that most States do not provide services over the ICAO NAT region high-seas.

132 The issue of SES applicability over high seas of the ICAO North Atlantic Region is linked to the need to prepare the legal text for possible Icelandic membership

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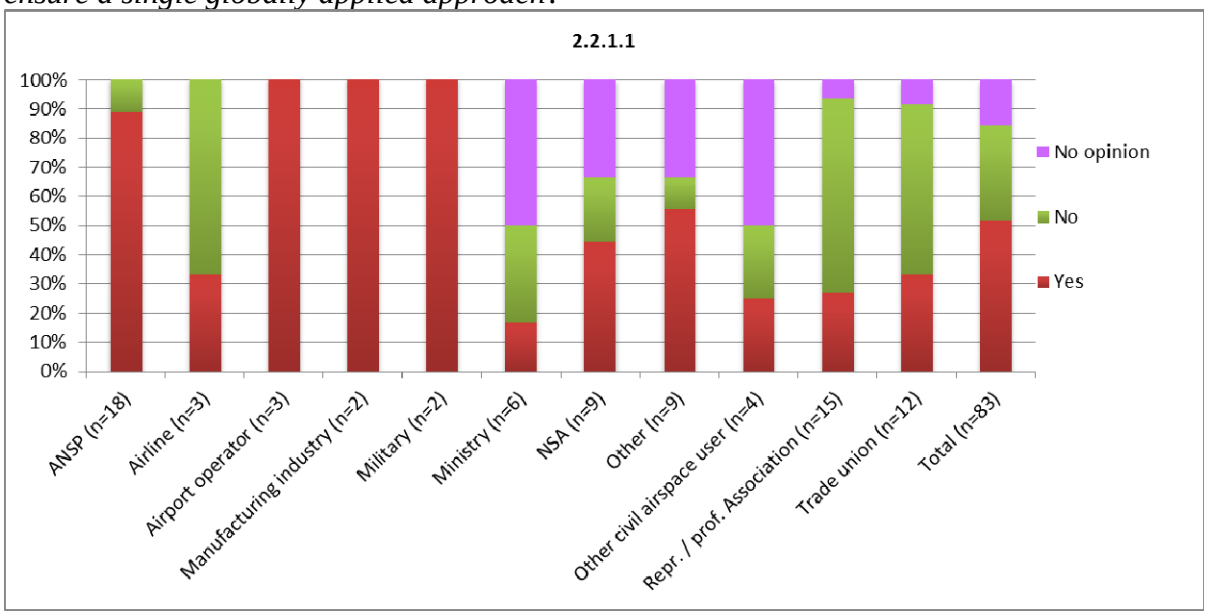
***Figure IV- 28**: Address the overlap between SES legislation and EASA legislation through a single policy framework, as in other areas of aviation (e.g. licensing or air operations) to ensure a single globally applied approach?*[133]



Around 50% of stakeholders believe that this area should be addressed. These are mostly the ANSPs, airlines and half of NSAs. 30% of stakeholders (mostly representative and/or professional associations and trade unions) state that this issue should not be addressed. Some 15% do not have an opinion. In retrospect it may be considered that the question was somewhat misleading as it did not explain that the policy choice was already made in 2009 and at this stage focus is only on the specific implementation of the existing framework. However it is positive to note that those most impacted by the current regulatory framework believe the choice made in SES II should be carried through.

133 This question is linked to the need to comply with the requirement stemming from SES package of 2009, which is included in Art 65a of Regulation 216/2008. It requires the Commission to adapt the SES regulations to EASA's new scope by removing overlaps and gaps once the fundamental implementing rules have been created

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Appendix to Annex IV

NOTE ON THE DISCUSSIONS IN THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE HEARING 21 JANUARY 2013

Welcoming provided by **Brian Curtis**, president of the EESC study group on SESII+ and Introductory remarks by **Jacek Krawczyk,** Vice-President EESC.

KEYNOTE SPEECHES

- **Siim Kallas,** Vice-president, European Commission

  Responding to the cost and capacity crisis in the 1990s, the first SES proposal wanted to offer a means for capacity building, together with the SESAR programme for the technological part. Introducing a focus on all aspects of ATM performance, the SESII package was launched in 2009, establishing the Network Manager function. Still, so far the single European airspace has not become a reality, and the SES is not delivering sufficiently. Challenges such as delays and flight inefficiencies remain. The functional airspace blocks (FABs) are late, and National Supervisory Authorities are struggling. This is why proposals for a SESII+ are presented: "to accelerate the implementation of the Single Sky, complement some initiatives which are not yet complete and strengthen the existing legislation."

- **Bernard Gustin,** CEO, Brussels Airlines
  The aviation sector represents an important business sector, millions of jobs and makes up a high percentage of GDP. Comparing the profitability of EU air transport with the rest of the world, there is no sign of mismanagement, but rather a structural issue. Cost reduction objectives have been set by the European Commission and SES is the solution: we have to go there as soon as possible, including competitive infrastructure, coherent growth supporting EU aviation policy and a global solution for ETS. The reason for the slow progress is clear: the lack of Member State commitment costs millions of Euros a day and, thus, hampers economic recovery. SESII+ should focus on strengthening the economic regulation at EU level, define penalties in case of non-compliance, promote liberalisation and the unbundling of ancillary Air Traffic Management (ATM) services, and more airspace user involvement, without administrative burdens.

- **Claude-France Arnould,** Chief Executive, European Defence Agency (EDA)
  SESII+ will have consequences for the defence actors, not only in terms of costs but also in view of decreased budgets for the sector while the requirements remain similar. The EDA is not only a user of the airspace but offers services as well. There is an industry that has both civil and military activities and it contributes to economic growth, jobs and innovation. It is important that the military is included in the regulations and the technologies of the airspace so they can have trainings and operations. It is a fact that routes can be slowed down because of military activities and there is also a wish to use time and fuel in a more economical way. A flexible airspace, more speed and less consumption is a shared concern of civil and military actors. Finally, it is crucial that costs are evaluated and a coherent vision of civil-military cooperation is elaborated.

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FIRST PANEL ON PERFORMANCE

General picture; FABs; unbundling; customer focus and role of users

- **Jacek Krawczyk,** Vice-President EESC
  The EESC is interested in maintaining a dialogue within the sector, including the social dialogue. The SES project has lasted for quite some time already, and now it's time for a decision on its implementation.

- **Matthew Baldwin**, Director Aviation Policy, European Commission
  Performance is absolutely the raison d'être of the SES. When listening to both sides during the debate (airlines, Air Navigation Service Providers (ANSPs)), it seems that they are dragging each other apart, while a workable way to deliver performance in the system needs to be found. With the performance scheme, the Commission already came up with a compromise formula that aims to empower business and Member States to work together and determine the targets of that efficiency drive. It is now the time to find a balance between reality and ambition, and to make the necessary changes. FABs have always been central to the SES and the Commission will continue to push their development. Some Member States will go through an infringement process later this year. It is important to evaluate all the functions that are currently performed in FABs. If a way to make ancillary services more independent can be found, it would possible to attract knowhow from elsewhere, benefiting from more rationally organized and specialized subcontractors. The customer focus must be back to the heart of ATM: the industry should have a bigger role in the work of the Network Manager, and the airspace user groups should have a role in the governance of ANSPs.

- **Massimo Garbini**, CEO, ENAV (Italian Air Navigation Service Provider)
  The modernization of the EU ATM is crucial for its economy. The separation between regulation and service provision should be reinforced. FABs are a heterogeneous reality and should be flexible, keeping into consideration Member State agreement and a strong role for ANSPs. The centralized functions should be fully implemented, ranging from a reinforced role of the Network Manager to the establishment of a Deployment Manager by 2014 and the extension of the SESAR Joint Undertaking beyond 2016. The performance scheme must come with a robust and continuous improvement mechanism. Furthermore, it is necessary that specific infrastructural and operational centralized services with new economic and governance models are identified. Of course, an effective funding and financing model is indispensable, as is a streamlined institutional and regulatory framework. Overlaps, gaps and conflicts should be avoided, while centralised regulatory functions should go hand in hand with efficient resource use.

- **David O'Brien**, **Director** Flight and Ground Operations, Ryanair
  FABs are a great idea, but so far they have been hijacked. They should be open to tender at regular intervals. It is a concern that some ANSPs are getting ahead of the game to create what are called FABs but in fact are monopolies that are becoming cartels. As far as the economic regulation of ANSPs at national level is concerned, it seems to suggest that ANSPs should never ever fail. The UK has an administration that allows the transfer of the operation, the equipment, the staffing, to the state in the case of economic collapse of the supplier. This should be brought forward by the Commission. The inability to fail comes from the view that the service is essential. How can it be if a service is essential that many flights are cancelled by air traffic control actions? Ryanair is therefore in favour of a ban

on strikes. One proposed solution for the strike problem is that there would be notice. But that does not really help: the ANSPs suffer the loss, just like the airlines do. The Commission should put a cap on the license fee that the state might impose.

- **Luc Laveyne**, ACI Europe
  The fourth pillar of the SES is airport capacity. The whole concept will never be successful if ground and air capacity objectives are not streamlined. Even with the best use of existing capacity, certain bottlenecks in the network cannot be solved without additional ground and runway capacity. SES and SESAR can help maximising the effect of existing ground capacity. SESAR deployment should be led by those who bear the risk of investing. It is important that a better use of capacity on the ground happens by optimizing processes, with the involvement of all airlines, and by connecting airport and network operations plans. The most efficient way to handle ground processes is to install some kind of airport capacity coordinator. It is important to focus on the turnaround process and inbound information.

- **Riccardo Rubini**, President ATM Committee, ETF
  The rhetoric of SES implementation and the related unrealistic expectations are based on political targets more than on needs and possibilities. The European Commission has always tried to introduce competition, liberalization and market principles without considering the negative effects on the workers. The comparison between the EU and the US systems is unfair: they have a different social, political and economic history with the main difference being the funding system (in the US by the US treasury). ETF is also against the Commission's plans of different rules for ancillary services: it will create new fragmentation and will jeopardize the number and the quality of jobs. The human dimension in the SES is missing and should be introduced in the legislation, such as training, mobility issues, social effects, social dialogue, safeguards for jobs and their quality. The dissatisfaction concerning FABs comes from unrealistic expectations. A unique model for FABs based on the consolidation of service provisions, reduction of the number of national providers, reduction of the number of jobs etc. is not acceptable for the ETF. The ETF calls for a target setting process that is realistic and does not affect collective agreements and social conditions, as well as the number and quality of jobs and working conditions. Top priority should be safety and operational performance, rather than cost reduction.

- **Moderator: Jacek Krawczyk**
  The world is not one-dimensional: who shoots should be prepared for the ricochet. The passengers want the whole value chain to perform well, and one party must not keep the others 'hostage' for whatever reason. The EESC is a house of discussion, not of threatening. If the goal is to not make a change, that is not the right approach.

SECOND PANEL ON THE INSTITUTIONAL SET-UP

The role of Member States and resources for National Supervisory Authorities (NSAs); 'triangle reorganisation - Commission – EASA - Eurocontrol

- **Moderator Maria-Jean Marinescu:**
  FABs are actually not necessary; an SES could be established in 6 months with the political will and the technical means.

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- **Margus Rahuoja**, Cabinet Member of the Commission Vice-President Kallas
  There are a certain things to do in 2013 concerning the institutional set up: how to deploy SESAR, the role of the deployment manager, decide whether the work can be done under the exiting convention or if there should be an upgrade, whether the community method is valid for achieving the SES, etc. The Commission cannot take the lead because it can only regulate and facilitate. It should be the whole community taking the responsibility now. The community way seems to be the only way forward for the SES; it is now about how to define it and where to put the emphasis.

- **Dirk Nitschke**, Director Air Navigation Services Division, German Federal Ministry of Transport, Building and Urban Development
  It is important to try to understand the views, constraints as well as the possibilities of the other SES partners in order to come up with realistic goals. Concerning cost efficiency, it is important to look at the reduction of air navigation user charges but also at the total cost for everybody involved. With the way forward as defined by Commissioner Kallas in Limassol last October, there are doubts if any goal will be achieved. For example, many Member State representatives will be very alerted towards any proposal, as it could become a legal basis for infringement procedures against them. Concerning the ANSPs, it is important to note that these do not always have the necessary tools to reduce costs because they have to deliver services at any time. FABs have been implemented on a legal basis, after enormous efforts. Moreover, there are concerns from the ATM world about EASA's involvement in the technical parts, i.e. not just in the safety related parts. Finally, the Commission should also be encouraged to make a maximum use of Eurocontrol for its expertise and appreciation from non-EU Member States and the military colleagues.

- **Patrick Goudou**, Executive Director, European Aviation Safety Agency (EASA)
  Concerning the role of EASA on non-safety issues, it has always been difficult to make a clear distinction between safety and non-safety in technical matters. The only solution was to give all technical matters to one body. Of course, EASA will rely on Eurocontrol for expertise as well. The regulatory framework on ATM is currently not consistent because of overlaps. Furthermore, the roles of the different bodies are unclear; there is a need to allocate tasks clearly which means that Eurocontrol will focus on the operational tasks and EASA on the regulatory tasks. A clear structure involving all actors should be designed, describing the role of each of them without gaps and overlaps. The community method will remain the strongest one in the future. EASA should be able to help the NSAs for example with staffing problems. To make savings, the resources should be allocated to all actors in accordance with the task they perform, as to decrease the costs.

- **Patrick Vanheyste**, Director, Belgian National Supervisory Authority (NSA)
  There are a lot of overlaps between the institutions (Commission, EASA, Eurocontrol and FABEC, which is the Central-European FAB) which makes the job more difficult. We also need to raise the budget and the number of staff because we are embedded in a national structure. Making thorough assessments of the impact of new regulations regarding HR, training, budget is important. Concerning the training of staff, we need a form of standardized training. Furthermore, there should be more flexibility in the regulations concerning the number of experts vis-à-vis the size of the NSA. Developing a common understanding of how exactly to interpret the regulations among NSAs can take a lot of time. Administrative burdens are sometimes too heavy (questionnaires, reports…) to resolve the human resources related problems, NSAs could cooperate, for example via the NSA cooperation platform that could be formalized. To successfully implement the SES

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requires strong and independent NSAs, cooperation between them and the necessary time for them to adapt to new situations and rules.

- **Patrick Ky**, Executive Director, SESAR Joint Undertaking
  There has to be a virtuous performance framework in SESII+, despite the long investments cycles and the multitude of factors that influence the success and benefits. One of the main fears is that the performance framework would push cost efficiency targets, resulting in a reflex to focus on short term benefits only. Therefore, the performance framework should ensure medium to long term investments. Some financial schemes should be implemented to incentivise the development of new technologies. In order to avoid inconsistencies and, thus, costs, it is also important to move towards a total system approach. There is no need to be dogmatic about centralized and ancillary services. Ancillary services are already to a certain extent operated by private companies, but at a national level. There should be a possibility to do this at a wider level too without the national level hindering this.

CONCLUSIONS

- **Krzystof Kapis**, Director Aviation, Polish Ministry of Transport
  Looking back at the previous meetings in Warsaw (2011) and Limassol (2012), the approach of the Commission has shifted, which means that some time has been lost. The main question remains where we are now with the implementation of the SES II package. Problems need to be identified and solved, even if that means that additional regulations are adopted through an SES II+, keeping in mind that there needs to be a balance between regulation and action. Every element of the system should be exactly defined in light of the total system approach: no overlaps, no duplication.

- **Matthias Ruete**, Director-General for Mobility and Transport, European Commission
  It is important to distinguish between the actions that still need to be done to ensure that the SES objectives are implemented, and the decision about the levels on which these actions are needed. The cost of service provision needs to be under control. Has the performance scheme as it was conceived delivered or does it need to be strengthened? Business models need to change, but how can these changes happen? FABs need to become performance driven, the Network Manager needs to be strengthened, and the ways to modernize ANSPs should be examined to deliver the full potential.

  The capacity crunch *will* come, and if it is unprepared this will lead to a very difficult situation. One of the answers will be technology: deployment of SESAR, etc. There will also be questions of environmental impact to deal with, and technology and SESAR will be a solution. Furthermore, dealing with safety can be done in a smarter way, balancing measures with costs. Concerning the institutional framework, we will never have a 'European FAA', but there will be at least three bodies at the European level dealing with aviation: EASA, Eurocontrol and the Commission. Overlaps, redundancies, duplications and contradictions should be deleted.

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ANNEX V
ASSESSMENT OF OPTIONS

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ASSESSMENT OF IMPACTS

1 INTRODUCTION

This Annex backs up the assessment of impacts in chapter 5 and 6 of the main report with methodological explanations and additional evidence.

Given the strong focus on cost-efficiency, the main impacts of this initiative are economic. The assessment will focus on impacts of the proposed options on:

- **cost efficiency** Is linked to the direct cost of service provision, which is charged to the users mainly in route charges. Some other charges are often used as well, such as charging for meteorological services, charges for aeronautical information publications, terminal charges etc. However route charges are the biggest group and reflect directly the cost-efficiency of the core ATM services and are hence commonly used as an indicator. Service provision has traditionally been organised on a user-pays principle and in fact until the performance scheme was introduced, European ANSP's operated in a full cost recovery environment where all costs could be charged to users, without explicit limits. The performance scheme changes this by setting target prices/costs that effectively cap the charges.
- **flight efficiency** is divided into horizontal and vertical flight efficiency. Traditionally horizontal flight efficiency has been more in focus, but attention is nowadays turning also to vertical flight efficiency. Horizontal flight efficiency essentially seeks to use the most fuel efficient route between departure and destination airports. Most of the time this is the great circle route, which is the shortest distance between two points on a globe. Sometimes weather phenomena (wind, thunderstorms…) make a longer route preferable, but for purposes of the relatively short intra-European flights and ATM performance measuring the geographically shortest route is used. On the other hand vertical flight efficiency considers the optimal profile for the aircraft to climb to its optimal cruising altitude, and the most fuel efficient descent profile back from that cruising altitude to the destination runway. A third element is to minimise the changes in altitude once the aircraft is at cruise, in order to avoid the fuel burn associated with these extra climbs. Generally speaking the most efficient profile is one of maximum power climb directly to the route and again a gliding descent with engines idling back down. However this is often difficult due to other traffic, departure or arrival procedures/routes or poorly sequenced traffic flows etc.

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- **capacity/delays** ATM capacity may be constrained through many factors, such as runway congestion, congestion in en-route sectors[134], technological problems or overall technology or staffing levels that don't correspond to the traffic levels. Good planning of investments in the long run and traffic flows on the short run can help resolve capacity issues and reduce delays. However all capacity measures come at a price, so that cost of investment has to be balanced against the users valuation of the cost of delays and consequently the optimal delay level is higher than zero.
- **administration costs** – includes any additional cost burden to the industry or authorities, generated by the introduction of policy options. For example, it has been taken into account both the costs that have to be met by different bodies, operators and public authorities when making changes in management and governance structures, preparing tenders and any other significant compliance and enforcement costs[135]
- **budgetary costs –** impacts on national or EU budget.

In addition to economic impacts, the policy options would bring along also certain social impacts in terms of changes in employment levels and working conditions. These impacts are interdependent between the various options chosen and also on external factors. Therefore an assessment of the employment impact has been performed based on the scenarios described in chapter 6. For more detail on the impact and groups of employees affected, see chapter 8 of this Annex.

As regards safety, the initiative aims to be 'safety neutral, i.e. any measures should not alter existing safety levels. The environmental impacts in terms of emissions and noise are indirect and driven by gains in flight path efficiencies.

The impacts are quantified wherever possible, using ranges of estimates (rather than discrete values) where relevant. However, a number of options concern aspects such as administrative or governance efficiency, where all elements of changes cannot be quantified, or where they are essentially enablers for policy domain. In addition the precise impact of e.g. improved performance target setting depends on a variety of external factors – in particular the negotiating and bargaining skills of various participants.

The assessment is based on:

- Interviews with key stakeholders
- The electronic survey among stakeholders carried out by the Commission
- Literature review
- PRB monitoring results, studies and discussions with PRB on specific issues.
- A dedicated consultant's study on SES II[136]+ including E3ME macro-economic model.

134 A sector is a piece of airspace, handled by a single controller. Its size is mostly limited by the density if traffic as a controller can only handle a limited amount of aircraft at the same time.

135 This approach differs from the approach set out in the IA Guidelines for administrative costs, as it would have been very difficult, if not infeasible, to separate administrative, regulatory and compliance costs.

136 Analysis of impacts is largely based on the work of the consultant. For full details, see the IA support study, especially its Appendix D [add link after publication]

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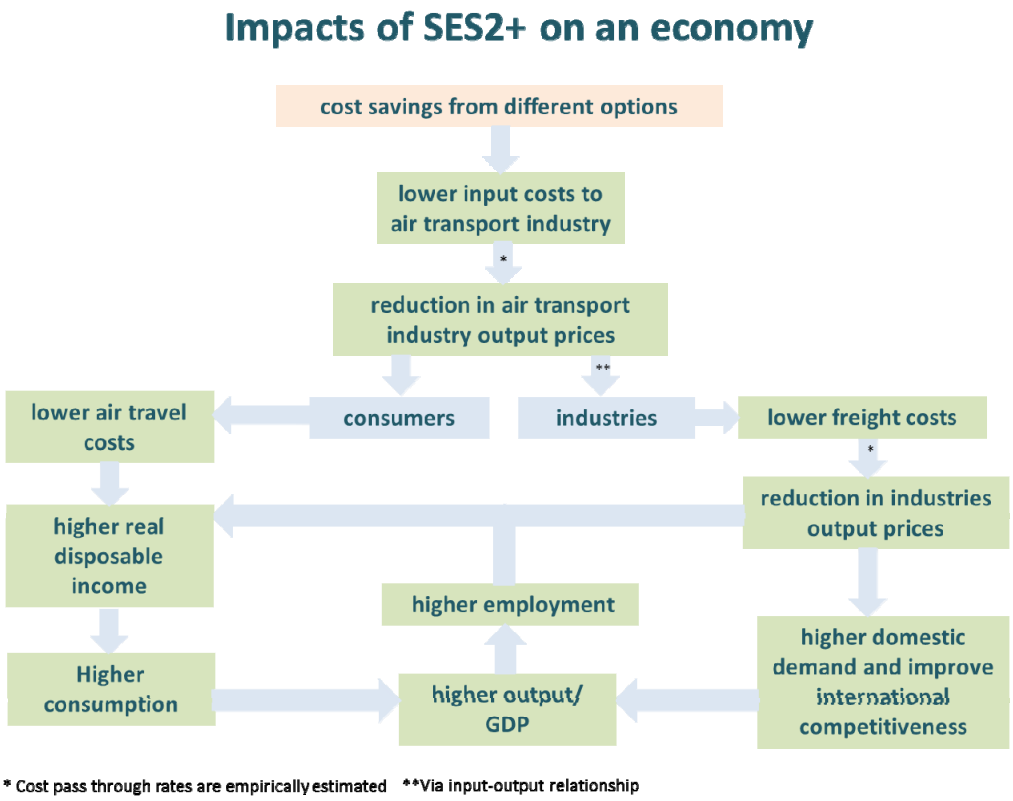
- (as illustrated on Figure V-1 below).

Figure V-1: Analytical framework for E3ME model



The e3ME model used by the consultant is a European economic, energy and environment model, where relationships are estimated from historical data. The structure is based on the system of national accounts as defined by ESA95 (EU Commission, 1996), with further linkages to energy and materials demands and environmental emissions. The labour market is also covered with estimated sets of equations for labour demand, supply, wages and working ours. In total there are 33 sets of econometrically estimated equations, including components of GDP (consumption, investment and international trade), prices, energy demand and materials demand. The historical database used covers the period 1970-2010 and the main data sources are Eurostat, DG ECFINs AMECO database and the IEA, supplemented by OECDs STAN database and various other sources as appropriate. The analysis also includes indicators, which were included in the McKinsey study on the macro-economic impact of SESAR (June 2011).

2 INTEGRATED STRUCTURE AND SUPPORT SERVICES

Option 1.1 – Do nothing.

Description: This option is to retain the existing arrangements, allowing the various ANS to be bundled into a single service provider, which can then be designated without application of normal public procurement rules. This option expects that any rationalisation will be driven by the performance scheme, the FABs and SESAR, but this will happen over an extended timeframe.

The following pro's and con's have been determined:

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Pros

- No changes in the set up for ANSPs and politically palatable to States.
- Avoids possible dislocation associated with unbundling.
- Avoids any cost of change beyond the baseline developments.

Cons

- The cost-effectiveness and transparency of service provision are not improved.
- Requires increased internal management effort if improvements are to be expected.
- Perpetuate the current problems.

Whilst legally this option does not preclude the possibility of unbundling, at present, there are no signs that the e.g. performance scheme would be causing ANSPs to re-think the management of support services. Such a move would create a risk of social unrest and the financial benefits would flow mainly to the airspace users and not the ANSPs. In the consultation the staff representatives were particularly opposed to mandatory unbundling as they do not believe the Commission should dictate the most effective ownership structures to support SES. They were also concerned that mandatory unbundling in a safety critical area is contradictory to safety as it increases the number of interfaces and thereby business, organisational and technical complexity; which must then be mitigated from a safety perspective.

There are also concerns with some militaries over potential foreign ownership of service providers, which demotivates States from even considering the move even if there are mechanisms to provide safeguards to security. This has been proven by the UK Ministry of Defence, which - under cost pressures - is looking to outsource maintenance and support services to all UK military aerodromes. On the other hand, many airspace users support moves to open up these services to market competition[137][138]. There is also evidence from smaller civil ANSPs that outsourcing of support services could be a preferred option to achieve economies, including matching services and service levels to operating hours, but these views are unlikely to influence the major bundled operators. Although possible, it appears unlikely that the States will undertake such moves any more than they have done since 2004, unless external pressure is available. There are also presently no signs that the performance scheme would be causing ANSPs to re-think how support services are best managed. Hence the baseline inefficiencies can be expected to continue unchanged.

Option 1.2 – Functional separation of support services

Description: This option requires ANSPs to organise the provision of support services internally in such a manner that they can be clearly distinguished as a single business unit. The separate business units must have separate accounts (i.e. their own balance sheets and profit/loss accounts), with cross functional charges clearly identified.

The study has identified the following pros and cons for this option:

137 AEA position paper, 'Public consultation in view of a simplification, clarification and modernisation of the Single European Sky legislation (SES II +) and alignment of SES and EASA rules', 25 January 2013.

138 ATA, ERA and AEA joint position "A Blueprint for the Single European Sky" in the World ATM conference in Madrid 12 February 2013

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Pros

- Relatively simple to set up for ANSPs and politically palatable to States.
- Creates more focus on cost of services and transparency on technical support costs.
- Avoids possible dislocation associated with unbundling.
- Uses cost transparency, benchmarking and a capacity for the operations arm to ask for external quotes to drive performance from the technology provider.

Cons

- The cost effectiveness of the option are linked to trade-offs between the scope and scale of the functionally separated business unit. The larger the scale and scope the more practical and effective will be the creation of a separate business.
- Requires additional dimension in financial reporting and performance monitoring systems.
- Requires commercial and market oriented, rather than political management approach in ANSPs.

Risks

- May lead to current situation being perpetuated with just additional cost being added in the form of new management layers.
- Moderate risk of strikes and disruptions to traffic.

Economic impacts

Cost efficiency: Overall this is unlikely to quickly change costs and there even is a risk that it will marginally increase costs charged to users, particularly in smaller ANSPs where new management layer would need to be created and currently multi-tasking staff would need to be duplicated or at least their work measured in two business units. Nevertheless, over time greater clarity over expenditure on support services should help identify opportunities to reduce costs of service.

Flight Efficiency: This option is focused on cost efficiency and will not affect flight efficiency.

Capacity: No impact is likely, assuming that quality of support services are not eroded leading to more frequent technical failures.

Administration costs: Whilst the business plans already today need to differentiate between the different services, under this option ANSPs would be required to provide separate accounting and business units for these services. It is expected that the creation of new business units within ANSPs will result in the increase of overhead staff costs within the ANSP. It is possible that some new staff would need to be recruited to manage the new business units. **Budgetary costs:** changes to the procurement of support services from third parties or the necessity to apply the separate accounting rule by the ANSPs will not have an impact on the national nor the European budgets.

Social impacts

Employment and working conditions: Likely to have minimal impacts on staff as they remain in the same organisation. On short term only minimal change in employment is expected, but on longer term – if the new management introduces efficiency measures – some redundancies could

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be encountered. These will however be in most cases overshadowed by the changes caused by the technology changes under SESAR project and most likely offset by similarly marginal employment increases in the airlines and the wider economy

Safety: No impact foreseen as the services themselves remain unchanged and are run by the same people. Already today strict EU rules apply on the use of safety management systems and responsible managers and these rules would continue to apply regardless of the format of the ANSP's. Also oversight is ensured as today so that the national NSA oversees the ANSP's and EASA oversees the NSAs.

Environmental impacts

There are no direct environmental impacts linked to this policy option.

Option 1.3 – Structural separation of support services

Description: In this option there is a structural separation of the support services from the core services. The assets and staff required for support service provision are transferred into a separate organisation which is independent from the core air traffic control (ATC) service provider. Subsequently, the possibility for Member States to designate these support service providers is abolished as they can no longer be bundled together with the core service. This makes the support services subject to European public procurement rules.

The study has assessed the following pros and cons for this option:

Pros

- Creates maximal focus on cost of services and transparency on technical support costs as services are tendered through an open process. This should lead to lower charges.
- Enables a true market situation to be created, with the associated efficiencies.
- Eases the arrival of new entrants also from outside aviation, thus promoting technical development and improving quality. New concepts e.g. in meteorology could result in reductions in delays and emissions.
- The option would ease search for synergies at the level of FABs as support services could be shared more easily.
- Consistent with 2008 High Level Group endorsed approach to “Facilitate the application of market principles, unbundling and liberalisation of ANSP services.”

Cons

- More complex to set up than other options as this requires the creation of new entities.
- Major political opposition would rise in certain States
- Unbundling is not supported by trade unions. The European Transport workers Federation (ETF) has outlined its position as “... the application of market principles to ATM. If it has to be apply anyway, a regulatory control has to be implemented. There is a high risk that natural monopoly services rules under market laws will give priority to retribution of shareholders rather than operational performance of the service.”
- The cost effectiveness of the option is linked to the creation of new entrants in the market.

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- Requires oversight to ensure a true market exists, as the performance scheme does not apply to market-based services, but the targets apply only to those ANSP's operating outside the market mechanisms.
- Requires the different culture – commercial and competitive not political – and effective commercial organisational leadership to manage the process.
- Requires additional effort on contracting organisations to manage the outsourcing contracts
- Possible complexity in provision of services and ownership of infrastructure where they have been shared between the core and support services.

Risks

- Involves a considerable risk of strikes and associated disruptions to traffic
- Need to ensure continuity and quality of outsourced services
- ANSPs may lack know-how of procurement and establishing service contracts for outsourced services.

In this option there is a structural separation of the support services from the core services. The assets and staff required for support service provision are transferred into a separate organisation which is different than and independent from the core ATC service provider. Subsequently, the possibility for Member States to designate these support service providers is abolished. It becomes mandatory that support services become subject to European public procurement rules.

Overview of the experience in the sector and other industries

MET and AIS services were the two most contentious issues in the Reference period 2 consultation responses[139]. They are both well-defined at ICAO level so further service definition for outsourcing should not be a complex matter. There are also both public and private organizations that would be capable of contracting to provide the service at a national or even pan-European level as well as considerable experience of such changes in practise;

- The European AIS database (EAD) run by Eurocontrol is a good example of a pan-European service, combining both public and private service provision characteristics.
- In 2005 the FAA has outsourced its Automated Flight Service Station (AFSS) programme to Lockheed Martin, based on estimated savings of $2.2B over 10 years[140].
- The FAA is currently exploring a new outsourcing arrangement for its Direct User Access Terminal Service (DUATS)[141], a weather and flight planning service for pilots.

Controller training is also already often outsourced so the principle of establishing a structural separation of ANSPs' training centres is clearly feasible. Examples of commercial training providers in Europe include Entry Point North, ATS Global, DFS, NATS and Czech ANS. Since the implementation of Directive 2006/23, which harmonised controller licenses in the EU, there

139 Public consultation on the proposed regulatory approach for a revision of the SES performance scheme addressing the second reference period (RP2) and beyond 21/06/2012

140 AOPA,' Air Traffic Services Brief: Flight Service Station (FSS) Modernization: Lockheed Martin to Provide Flight Services for the 21st Century',17/7/2007, see http://www.aopa.org/whatsnew/air_traffic/a76_process.html

141 See https://faaco.faa.gov/index.cfm/announcement/view/11872

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should be relatively[142] free movement of controllers within Europe, lending further support to the concept of outsourced training.

As compared to controller training, aeronautical information and meteorological services, the CNS services have a more immediate impact safety and service quality, for example loss of any of the services can result in the need to increase the separation distances or times between aircraft being controlled to ensure collisisons are avoided, or to apply sector closures (resulting in delays, route lengthening or cancellation) so any unbundling will require clear service specification. However a number of manufacturers already provide operational maintenance of the systems so they should be capable of contracting for the total service as well. There is no reason, provided that issues of ensuring systems safety and service continuity can be addressed, why the service could not be provided by a non-ATM specific supplier; indeed the Airlines consider that this might result in significant advantages. There are also established models available in other sectors (notably rail) for establishing contractual, performance and regulatory oversight to manage safety and service continuity issues. Whilst outsourcing of meteorological services is already the norm, there are also a significant number of examples of outsourced CNS services world-wide. In Europe there are two notable examples:

- The Highlands and Islands Airports (HIAL) Ltd
- LFV-Eltel outsourcing.

Experiences of unbundling ATM support services

HIAL manages 11 airports in the north of Scotland. It outsources its aerodrome engineering, requiring a small number of engineers supporting 24x7 operations in shifts. The engineers are contracted through the UK NATS as a service. HIAL owns the CNS equipment, but is also considering the potential benefits of satellite navigation, which would do away with the need to own infrastructure. Overall HIAL's experience of outsourced Air Traffic Engineering services is positive but it also emphasized the importance of well-defined service contracts and the need to manage risks. Outside of ATS their experience of outsourcing is that they have been able to achieve lower costs and meet their defined levels of service (e.g. finding the spread of offers to be ~25% between the lowest and highest offers). A general issue is the need to have staff with sufficient expertise in procurement.

The Swedish ANSP; LFV, outsources systems maintenance of CNS equipment to Eltel Ltd since 36 years. According to PRU cost efficiency benchmarking data (ACE 2010), LFV's technical support staff is approximately 9% of total staff, compared to ~22% for Europe on average. LFV's experience with this outsourcing has been good. The benefits are improved cost efficiency and a high quality of service. LFV made an assessment for this study of "Maintenance Cost Effectiveness" and based on that, outsourcing to ELTEL is estimated to be about 50% less expensive than in-house provision. It was felt that in-house services do not always achieve the business-like services of outsourced arrangement. A key requirement for LFV is to keep ownership of the infrastructure in LFV, so that only maintenance is out-sourced. Other lessons of outsourcing are the importance of maintaining sufficient competence in the organisation to do the outsourcing

[142] Main limiting factor to free movement of controllers is the language barrier. For that reason most mobility happens in centres that serve only the (mostly English speaking) upper airspace or in States where only English is used in radiocommunications.

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and that it takes time to develop good service level agreements, which are essential to the success of outsourcing. The experience with CNS would lead LFV to consider further outsourcing arrangements. For example LFV is currently bound to use the national MET provider as the designated service provider, but EU rules already allow for forgoing designation of MET for the benefit of competition. Already today LFV outsources basic training to Entry Point North, previously their internal training provider and is considering full competition in the future. Outsourcing is not used for non-technical functions such as payroll, HR etc.

Experiences of unbundling in other sectors

Network industries share many common characteristics[143]. On the one hand, the infrastructure segment displays features of natural monopoly and is subject to regulation on pricing and access to the network. On the other hand, market principles may be ensured in network services, as long as each operator gets a fair and transparent access to the infrastructure. Experience in other markets, that were opened up, has shown improvements in the level of quality and availability of services. In some rail markets the passenger satisfaction rose while the number of passengers increased in some cases approximately 50% over 10 years period. In some cases, tendering of public service contracts has shown savings of 20-30% for a given level of service which can be re-invested to improve services[144.]

Liberalisation of European Railways[145]

The development of a competitive market structure was vital for the supply of public transport services. Since railway market liberalisation, the following benefits were observed in various EU Member States:

- the Netherlands gained 20–50% through competitive tendering efficiencies,
- Germany observed 28% increase in train kilometres, 26% reduction in subsidy paid, 43% increase in passengers, 500 kilometres of re-opened lines and 300 re-opened and new stations,
- Sweden reduced its subsidies by 20–30% through tendering and increased the customer satisfaction.

In the Recent Impact assessment on the 4th railway Package, an estimate of further operational efficiency improvement from compulsory competitive tendering of 15% was applied[146].

Market opening in the telecom sector[147]

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143 Report on the market functioning of network industries (Electronic Communications, Energy and Transport) produced for the Economic Policy Committee and published by the Commission on 16 November 2012

144 Siim Kallas, European Railways at a junction: the Commission adopts proposals for a Fourth Railway Package, http://ec.europa.eu/commission_2010-2014/kallas/headlines/news/2013/01/fourth-railway-package_en.htm, 30/01/2013

145 Commission Staff Working Document, Impact Assessment Accompanying the document: Proposal for a Directive of the European Parliament and of the Council amending Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area, as regards the opening of the market for domestic passenger transport services by rail and the governance of the railway infrastructure, Brussels, 30.1.2013, COM(2013) 29 final; ANNEX VIII

146 COM(2013) 29 final, Qnnex V, section 5

147 Idem

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Regulation (EC) No 2887/2000 of 18 December 2000 provided for an unbundled access to the local loop. The unbundling led to increased competition and stimulated technological innovation on the local access market, resulted in the decreased charges for telecom users, as well as encouraged the provision of a large range of competitive electronic communications services.

Liberalisation in the energy sector[148]

The Second energy Package of 2003 introduced limited unbundling provisions. The Commission's Energy Sector Inquiry, launched in June 2005, identified a number of areas that needed improvements; inadequate separation of network and supply companies in particular. The Commission proposed the Third Energy Package (2007), addressing this issue as well as proposing the option of an independent system operator (ISO) which envisages energy companies retaining ownership of their transmission networks, but the transmission subsidiaries would be legally independent joint stock companies operating under their own brand name and with a number of very strict structural safeguards ensuring the autonomy of the ITO from the holding company.

Economic impacts

Cost efficiency: From discussions held in the course of this study, it is likely that even assuming a very conservative figure[149] structural separation can eventually lead to cost savings of at least 20% on the costs of support service provision per year through market pressures. This would amount to some € 450 million in cost savings per annum[150], which is around 5.4% of the total € 8.3 billion annual ANS costs in 2011. In the case of MET services the cost savings could be much more, but require States to agree on removing the implicit subsidy that aviation provides to national MET providers[151]. Further structural separation of training services may also promote more of a market in these services and lead to lower overall costs and potentially some consolidation of training facilities in Europe, further reducing costs. The training establishments will need to be capable of providing a sufficient flow of graduates to support European ANSP demands to avoid staff shortages which would cause longer term threats to system capacity.

Structural separation of CNS offers the potential for this service to be delivered on an supra-national basis which in turn could promote reduction of sites and greater efficiency in the operation and maintenance, including savings accruing from reduction the range of equipment employed in the form of smaller spares inventories and reduced ATSEP training requirements.

Flight Efficiency: This option is focused on cost efficiency and will not affect flight efficiency.

Capacity: No impact is likely, assuming that quality of support services are not eroded leading to more frequent technical failures.

Administration costs:

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148 Idem

149 Development of a real market with competitive pressures takes time, so initial results would be less high, whilst over time a much better result could be expected

150 Total ANS costs amount to € 8.3 billion in 2011, according to PRR 2011, of which 27% is taken up by support service costs (source: PRU). A reduction of 20% of these costs is around € 450 million

151 Currently many meteorology services are provided to the general public for free, whereas aviation pays a disproportionate amount of the total cost

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ANSPs

Most of the ANSPs in Europe have been managing and providing their core services together with the support services. For many of them it requires considerable effort to separate the services due to their interdependency and importance for other services. For example weather observation may be done by the air traffic controllers and relayed then to the MET provider without separating the cost in accounts. However, several ANSPs in Europe have started outsourcing some of their services to external companies. In some cases these practices started many years ago (Sweden in CNS, most States in MET) while more recently their slow emergence at other ANSPs can also be observed throughout the Europe. A legal requirement to subject all support services to public procurement rules would force the ANSPs to define detailed specifications for services, the conditions for their provision, and the rules for non-compliance or non-performance, etc. Since most ANSPs lack experience required for managing the outsourcing, they would need to hire additional staff specialised in procurement. It is expected that the ANSPs would need some time to prepare their operations as well as to change the current mentality and approach of the existing staff. It is expected that on average, each ANSP would have to hire at least 1 additional procurement expert. The average European costs of staff at ANSPs are approximately € 162 000 a year[152]. Therefore, as a result of this option, the administration costs are expected to increase by € 4.5 million per year.

NSAs

Under this option, the NSAs will need to check and to certify the new service providers. Therefore, the NSAs will need additional resources to accommodate these new tasks, but considering the limited number of these providers and the fact that their management systems and other means of compliance have already been checked when they were part of the core provider, the net extra burden associated with this task will be limited compared to the current situation. An input from the NSAs will however be required, especially at the beginning of the implementation process. The NSAs will need to develop internal procedures for assessment of the new support service providers. There is also a possibility that the same companies might become the service providers in numerous countries at the same time in which case certification cost will only happen once and oversight will be shared by several NSAs, thus reducing oversight costs.

Social impacts

Employment and working conditions: A reduction in staff or changes to working practices as a result of downward pressure on costs is likely in this option. This implies changes to employee conditions and lower job quality. As with the performance target options, this will most likely affect engineering and administrative support staff. However the effect of technology change in the field will most likely be much larger than the one caused by unbundling as the service itself will undergo fundamental changes through the disbandment of ground-based infrastructure and move towards increasingly automated weather observation and data processing techniques.

There are likely to be redundancies in ANSPs as the efficiency of service provision increases. However the support study show that the expected levels of cost improvements in support services would enable further growth in airlines and the wider economy, to the extent of 2000 additional jobs until 2030, which is expected to cover the negative employment impact in support services.

[152] Costs for supervision in France and Germany for 2011 corrected for overheads and adjusted to EU 27 averages based on GDP per capita expressed in PPP

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Whilst a full comparison with past experiences is difficult, the employment impact in ATM companies that have gone from public sector to privatised service provision may give an indication of the direction and magnitude of change. NavCanada has operated a private enterprise since 1996 and during that time its overall staff numbers have reduced from 6400 in 1996 to slightly below 5000 in 2013. However at the same time the number of air traffic controllers has risen by over 200 to cope with a 50%[153] increase in traffic during that period. This exemplifies well the potential impact on support services. As regards the UK NATS a comparison of PRC ACE-report[154] figures show total NATS staff to be 4882 in 2002, going up to 4932 in 2005 and then down to 4541 in 2010. This is a 7% reduction in 2002-2010 and about 10% reduction in the last 5 years. In contrast the Swiss Skyguide has seen an increase between 2002 and 2010 from 1151 to 1308 in staff, which is some 13% in 7 years. During the same years overall employment declined by about 5% in the 27 EU ANSP's. This shows that benefits have been reached with very different impacts on staff and sometimes it has been enough to slow down staff growth in face of growing traffic to achieve efficiencies. Based on these figures it could be assumed that on average reductions would remain at a maximum of 10% over 10 years, with an emphasis on support services.

Safety: No impact on safety is expected from unbundling. The technical requirements set by law, as also the oversight system relying on NSAs and EASA will stay the same. Some minor disruptions of service are possible where the fundamental mechanism or technology of service provision changes, but the current requirements on management systems are expected to be sufficient for covering these changes safely.

Environmental impacts

There are no direct environmental impacts linked to this policy option.

3 FOCUSING ANSPS ON CUSTOMER NEEDS

Option 2.1 – Do nothing.

Description: In this option the ANSPs would continue to operate the current consultation arrangements. Whilst these were an improvement over the re-SES arrangements, they are limited to certain airspace configuration and performance scheme change situations.

Identified pro's and con's at a glance:

Pros

- Creates no additional cost or bureaucracy
- The current arrangements could be exploited more efficiently if pushed by soft measures such as education.

Cons

[153] http://www.navcanada.ca/ContentDefinitionFiles/newsroom/Speeches/2012/CEO_Historical_Presentation_EN.pdf
[154] http://www.eurocontrol.int/articles/prc-and-prb-publications?tab_0_1 (2010 report, Annex 6, table 0.5)

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- No additional involvement of airspace users
- Consultation continues to be a one-way street.

Risks

- Involves a risk of worsening situation as the performance scheme becomes more central and if organisational unbundling is chosen as they give the ANSPs more freedom to operate.

The "do nothing" option would mean a continuation of the current variation of consultation arrangements. The regulations already require a certain amount of stakeholder consultation[155], but a recurring complaint of the airspace users is that its quantity and quality vary greatly from State to State. It should also be noted that the current requirement is primarily focused on the Member States and less on the ANSPs to engage in consultation, although the vast majority of operational decisions affecting stakeholders is done by the ANSP. Where consultation with ANSPs exists, this is also often seen as a one-way street with limited possibility for airspace users to take the initiative and come up with proposals. Together with the increasingly central role of the performance scheme and the overwhelmingly strong bargaining position of the ANSPs in that process, this creates the danger that the airspace users – for whom the ATM system exists – are gradually side-lined from the main decisions.

It should also be noted that consultation is not a shortcut to happiness by any means. The UK NATS is generally considered an ANSP, with an exceptionally wide-reaching consultation and airspace user involvement arrangements, yet it is still one of the most expensive ANSPs[156] in Europe, based on per service unit cost. It is clear that many other things – traffic density, traffic complexity, investment cycle, management decisions, pay levels etc. – which are not manageable through consultation, also affect the end price. However stakeholder involvement remains an important communication channel about customer requirements and a means of steering ANSP priorities within those external constraints.

Option 2.2 – Improved consultation and sign-off of some investment plans by airspace users.

Description: This option seeks to improve the consultation between the ANSPs and airspace users by including a mechanism for airspace users to sign-off ANSP investment plans. The system has two major aspects to it; (a) a partnership model, and (b) airspace users approval for investment plans.

Identified pro's and con's at a glance:

Pros

155 See Reg. 549/2004 Art 10 for general requirement on Member States to consult and e.g. Art 6(5) of Reg 551/2004, or Art 10(2)(b) of Reg 691/2010 for existing specific requirements

156 PRC Performance Review Report 2011: UK NATS ranks fourth with a service unit cost of 72,9€/service unit behind only Switzerland (92,9€), Spain (continental 75,5€) and the Netherlands (73,5€), leaving the other 31 surveyed providers behind with lower cost levels. It should also be noted that the Dutch rate is abnormally high due to a one-off cost to build equity capital

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- Partnership model
    - Greater clarity on process and procedures.
    - Greater motivation for ANSPs to improve performance.
    - Better mutual understanding of business and operational challenges on both sides is likely to lead to better solutions/ investment decisions.
- Airspace user approval of investment plans
    - Optimise alignment between airspace users and ANSPs.
    - Expose investment plans and the assumptions underlying these to scrutiny by those who ultimately pay for those investments.
    - Align investments with user needs – to the extent this is possible given the diversity of users.
    - Better alignment of priorities and timing of investment.
    - More reactive to down-turns in traffic.
    - Services of little or nominal value could be discontinued or replaced by services more appropriate to user needs.

Cons

- Partnership model
    - Success of partnership approaches is based on attitude, trust, respect and understanding, which is not something that can be legislated. The real effectiveness of a partnership approach is dependent on attitude.
    - It is time and resource consuming for both ANSPs and airspace users to engage in more consultation.
    - It is possible that the airlines (and certainly Military and General Aviation) do not want to approve the investment required for SESAR i.e. the customer priority (after safety) is cost and thinking is short term. This may create some issues if a local focus is taken instead of a broader network-level view.
- Airspace user approval of investment plans
    - May be seen as too big a change in ANSP/airspace user cooperation.
    - User willingness (and capacity) to commit to the adoption of new technologies, use of routes and procedures and sharing of information required for effective partnership.
    - Maintaining the balance of performance and safety is critical and something that ultimately the ANSP is best placed to determine – indeed it is the fundamental purpose and goal of the ANSP.

Risks

- Unless a co-ordination mechanism is created between the airspace users, the risk is created that the larger (national) airlines dominate the consultation process with a disadvantage to the smaller users and non-local airlines.

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- Airspace user's aspirations may not align with the long term need of the network, as their priority may be lower charges at short term, with a risk of neglecting the need for investment in infrastructure and operational improvements; i.e. supporting the SES cost targets at the expense of capacity targets. This would require strong SESAR-based rules to ensure proper infrastructure development is not hampered.

The option has been created based on several existing models. The main driver for these models has been that unless consultation is properly structured and motivated, it becomes a one-way venue for informing customers of decisions already taken. Essentially a good consultation would start by defining;

- What information will be provided
- Timely provision of information
- Pro-active advice from the ANSP of relevant changes/information
- Opportunity for exchange of views
- Possibility to influence decisions before they are formalised
- Explanation of reasons for decisions
- Consideration of the impact on the other party
- Sharing of relevant data and plans on both sides (i.e. also from airspace users to ANSP, in order to give the ANSP clarity of what is required in the future)
- Protection of confidential information

As an interim measure until SES has had a chance to improve the situation, IATA has encouraged ANSPs and the users to establish **partnership agreements** – referred to as Performance Partnership Agreements (PPAs) - which establish a framework for the consultation process and its content. Whilst the IATA PPA model agreements are focused on commercial airlines the model could be extended to cover arrangements with military and general aviation airspace users.

In the UK context the discussions ahead of setting the Control Period 3 formula, NATS (NERL) and its users have undertaken a process of discussions, whereby they are seeking to agree between each other the key assumptions that will underpin the decision for the NATS price control. This followed a similar framework to the “Constructive Engagement process” between the airport operator BAA and its users, which is modelled on the approach taken at airports in Australia. As a part of this process a Customer Consultation Working Group was established to discuss issues in depth. The partnership model was previously advocated by CANSO and evolved at a time the CEO of the New Zealand ANSP was Chair of that organization. The key features of the New Zealand model are:

- Consultation is effectively continuous and focused on particular issues rather than consultation for the sake of it.
- Additional motivation is created with a profit sharing arrangement where airlines receive annual rebates based on the profitability of the ANSP.

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- Major investments are approved by users who have to ultimately pay for them. Without approval, the investments would not have been made and the cost estimates are binding and come with funding agreements. For example:
    - Instrument landing system (ILS) installation was approved by airlines with a linked agreement to a fixed term adjustment to airport terminal area charges to fund this.
    - ADS-C system for Oceanic control was implemented with customer agreement which involved the commitment for 25% of the users to be equipped to use the technology (FANS-1A), and only those users, paying an additional charge to recover systems and Satellite Communications costs. In the end the systems development costs significantly exceeded the levels defined in the customer agreement, but the cost overruns were borne by the ANSP in the form of loss of profit – the price applied was the price agreed with users.

It should however be noted that in the New Zealand context there are fewer ANSP/Customer relationships to maintain relative to Europe, which helps develop strong inter-personal relationships and makes profit sharing easier. The relevance of this example is that it illustrates that greater user consultation and influence over ANSP decision making brings with it a requirement for more responsibility being assumed and acceptance of consequences by both parties. This includes binding commitments from the airspace users on future requirements – in particular that they will equip aircraft or fly new routes. As there is no legal requirement to do so, it may be difficult to ensure compliance by those airspace users that are less co-ordinated (third country operators, private owners etc.), so some element of legal equipage mandates is still required.

Cost efficiency: Effective consultation is central to ensuring that an ANSP understands the airspace user requirements. However, ANSPs cannot meet the needs of the users unless both sides are willing to share confidential information of their near and long term operational requirements. Hence improved consultation is likely to increase an ANSPs reaction to airspace users' demands for downward pressure on costs, but there will be balancing effects driven by other requirements. Also the fact that general and business aviation and military aviation have priorities that are not always the same as airlines priorities will affect the end result. For example access to airspace often features high on their agendas and may need to be balanced with pure cost concerns. Together with approval of major investment plans consultation is expected to have a moderate impact on cost-efficiency even if the exact size of impact depends greatly on local variables and the economic cycle in general (cost is prioritised during economic downturn, whereas boom times are usually accompanied by capacity concerns.)

Flight efficiency: This option should have a positive effect on flight efficiency as airspace users influence ANSPs to further improve routes. They may also increase ANSP motivation in applying new technology to improve flight efficiency.

Environmental costs: Any improvement to flight efficiency or 'engine-on' delays (airborne holding, taxi-times) will directly and positively impact environmental emissions. There are no expected noise benefits as that is not an immediate concern for the airspace users.

Capacity and delays: Delays provide the biggest adverse effect on commercial airspace users. For instance ANSP staff shortage in key locations would reduce immediate costs for the ANSP but disproportionally increase costs for the user. This option is likely to have a positive effect on delays as airspace users push ANSPs to solve capacity problems. Delay reduction tends to be attributed to proactive air traffic management co-ordination between control centres, improvement

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in staffing levels, improvement in industrial relations and working practices. Closer working relationships with airline customers are also significant if they engender an open exchange of information about future capacity needs. Alternatively it could have a negative effect if users elect to trade off delay for reduced costs i.e. if for example users were to opt to defer investment in infrastructure that would reduce delay in return for lower prices. Experience has shown that commercial airlines attitudes vary according to the economic climate, whereas ANSPs need to continue to invest for the long term. Many major ATM technology investments have a lifespan of 20-30 years, whereas economic cycles span only 6-7 years and may companies focus on quarterly profits. This causes a considerable risk to decision-making.

Administrative cost: It is expected that the consultations over ANSPs investment plans will require more time and effort from the participating stakeholders and particularly from the ANSPs themselves. The enhanced consultation and preparation of the PPA's as well as signing off the ANSP investment plans will require considerable manpower effort from the airspace users as well as from ANSPs to prepare the plans, to conduct consultations and to review. The airspace users might need to buy expertise from consultants in order to increase the effectiveness of their consultations. Based on experience from the airport charges consultation processes, it is expected that this would require around one FTE at airspace user side and 1.5 FTE at ANSP side. It is expected that the administration costs will increase by € 15 million[157].

Regulatory costs: The option will have no discernible impact on national budgets as all the work is undertaken between the ANSP and the airspace users, with the national authorities limited to checking that consultations have taken place, when they make audits.

Social impacts: Any social impacts would flow from reduction in staff or changes to working practices as a result of downward pressure on costs. This may imply changes to employee conditions and lower job quality. As with the performance target options, this will most likely affect engineering and administrative support staff.

Safety: Since the ANSPs and the airspace users have a mutual interest in safety, no negative impact on safety is expected. Co-ordinated technology and procedural updates may even contribute positively to safety.

Employment: Whilst very uncertain, it is possible that the downward pressure on costs will create an impetus for reducing staff, especially in services that are not in demand by the airspace users.

Option 2.3 – Option 2.2 + giving the airspace users groups a seat in the ANSP governance

Description: This option is proposed as an addition to the previous option, to give the three groups of airspace users (airlines, general and business aviation and military) a seat in the ANSP governance. It should enable these user groups to be more directly informed of the ANSPs business plan and hence have a greater appreciation of the rational for ANSP decisions. Users would also be in a more direct position to influence ANSP decision making, and counter any politically biased decision making.

[157] Average European costs of staff at ANSPs as calculated above calculated for 1,5 FTE per one ANSP and 1 FTE at airspace user side, calculated for 37 ANSPs and 37 airspace users

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In this option users would directly influence ANSP decision making, and be able to counter any politically biased decision making[158]. As directors are typically bound to act in the best interests of the organization, they may find themselves being somewhat conflicted between two opposing interests. Hence, their involvement on an ANSP board may not be as significant a step as ensuring that the ANSPs objectives are aligned with stakeholders.

The form of any airspace user involvement is assumed to be through appointments to the board (at the supervisory level in two-tier structures).In the UK such representation is combined with equity positions, although this is not a requirement. At the level of supervisory boards, stakeholder inputs will be strategic in nature. As such they may be likely to make a positive contribution to the overall direction of the ANSP, particularly concerning long term investment plans and collaborations within and between FABs.

The main considerations at a glance are:

Pros

- A regular physical presence of airspace users at the centre of ANSP governance creates a sharing of objectives and is likely to efficiently drive the ANSP towards user interests.
- As the governance positions give full access to documentation, they help transparency and finding of common solutions.

Cons

- The fact that only a few representatives of airspace users can sit at the board requires strong airspace user co-ordination, which is difficult when considering the diverging interests of the various user groups.
- With the representatives being e.g. employed by one airline but representing all airlines, it creates also conflicts of interest for them.
- The option is highly dependent on the quality of the user representatives and there may be a lack of resource and skill in airspace representatives to serve in the role.
- In the EU based ANSP where this model is in action, NATS, it clearly does not address all the issues. NATS is the most expensive of Europe's ANSPs and the airlines continue to be critical, notwithstanding their shareholding.

Risks

- This option involves an increased risk that the short term thinking of airspace users may jeopardize strategic investments (SESAR etc.). The airspace user's aspirations may not align with the network level interests, as their priority may be lower charges at the cost of investment in infrastructure and operational improvements.
- The option gathers only moderate support from States and string opposition from ANSPs and trade unions, which may reflect also on the political feasibility of the proposal.

[158] For example, airlines have been critical of some of Australia's ATM investments as being politically driven

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Comparative governance models include Airways New Zealand which has some voluntary user representation in a minority position, and NavCanada, discussed below. Drawing on these models, there are a variety of practical issues to be addressed, including:

- The appropriate user representatives have to represent the ANSPs entire user stakeholder base, as there will be concerns that persons in the board do not represent all types of stakeholders. For instance, the interests of the major commercial airlines are not the same as low cost carriers and general aviation operators tend to focus on different issues than the airlines.
- Ensuring that high calibre individuals are appointed, especially considering that they are likely to be in a minority of the board representation will be a challenge.

On the other hand the example of NavCanada is quite encouraging. The company was formed in 1996 as a special purpose, non-profit entity managed by a stakeholder board. The Board of Directors is made up of four major stakeholders to provide direction to the Company. They are mandated to put the Company's interest first and to build the quality of the Company's corporate governance practices. The individuals are not allowed to be employed currently in their industry, i.e. they are "arm's length" appointees. There are 15 Directors - 4 airline (Air Transport Association of Canada); 1 business aviation/GA (Canadian Business Aviation Association); 3 government; 2 union (Bargaining Agents Association); 4 unaffiliated and unconnected; plus the President and CEO.

The company's view is that the governance model has made it become more forward looking in operations, with improved safety, stronger investment in technology and more nimble business planning. The Board of Directors is supported by the NavCanada Advisory Committee (NCAC) consisting of 18 members funded by NavCanada to provide representation of airports and other small interests (including the small GA groups) by organising and channelling their feedback. There are also other advisory and consultative committees: Air Navigation System National Advisory Committee (ANSNAC), the Air Transport Operations Consultative Committee (ATOC) as well as other regular working groups and regional forums for additional consultation.

The Company produces an Air Navigation Service Plan typically updated every three years for a seven year period. Consultation is only on the operational and technical requirements and not on the resulting costs and hence User Charges. There is no restriction on Military occupying one of the three government positions on the Board, but this has not happened as it could not be a serving officer. There is a general argument that although NavCanada is a monopoly, it requires little performance oversight as stakeholders are already so well represented at the Board level and monitor performance. User Charges have not gone up for ~ 8 years, making charges around 25% lower in real terms after its formation. Costs have been reduced by efficiency measures and staff reductions. There has been no consolidation of Area Control Centres as the 7 centres in operation are believed to be about right given the volume of airspace, geography and time zones.

As regards the demand for this option, it is interesting to note that even in the public SES2+ consultation, the request for this type of full involvement was lukewarm.

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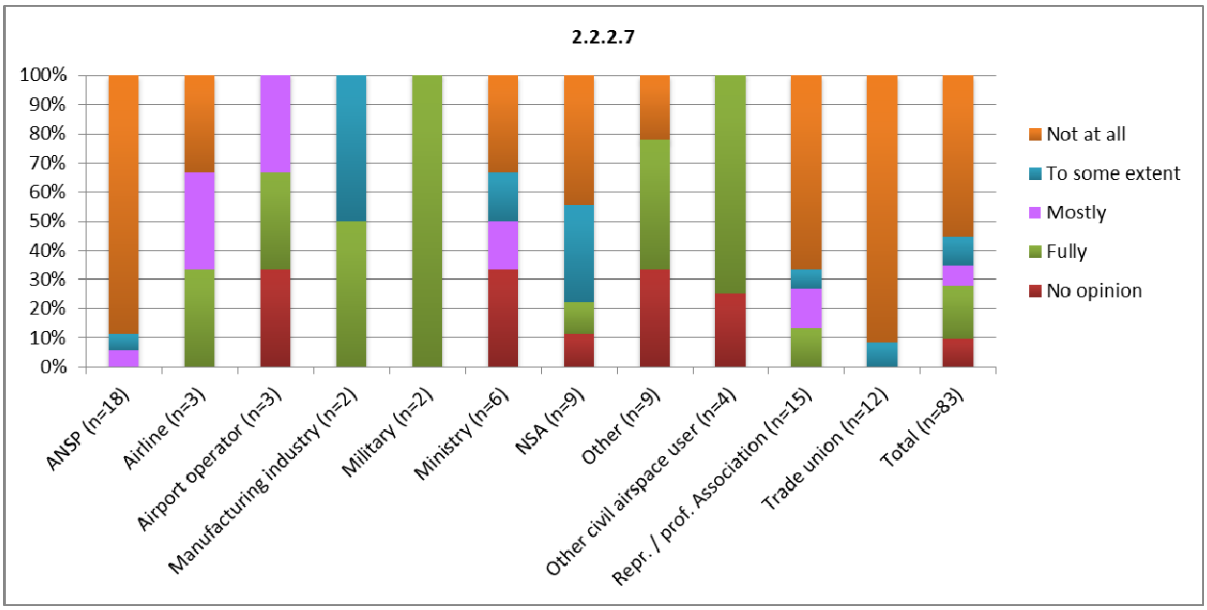
Figure V-2: Stakeholder replies to question "Q2.2.2.7. Should the EU require that all airspace user groups are to be involved in ANSP governance, in order to ensure focus on stakeholder value? "



A large share of stakeholders believes that involving all airspace users in ANSP governance is not a good idea. These are mostly stakeholders from the ANSPs, the representative and/or professional associations and trade unions. In particular the ANSPs and trade unions overwhelmingly oppose such an inclusion. Also the States are only lukewarm to the idea. On the other hand the military, civil airspace users and the manufacturing industries agree strongly with this proposal.

Cost efficiency: Compared to the other options, this should be most effective in improving cost efficiency as the airspace user groups are directly involved in making decisions at the ANSP Board. However as was noted for previous option, the cost-efficiency drive will most likely be somewhat balanced by the differing interests of the various groups of airspace users and the fact that many costs are influenced by external variables.

Flight efficiency: As for cost efficiency – and with the same caveats – this option has the greatest potential for improving flight efficiency due to the direct involvement in decision-making.

Environmental costs: Any improvement to flight efficiency or 'engine-on' delays (airborne holding, taxi-times) will directly and positively impact environmental emissions. There are no expected noise benefits as that is not an immediate concern for the airspace users.

Capacity and delays: This option would probably achieve the best result as directors on a Board could be legally required to support the best solutions for the ANSP to meet all user requirements rather than the individual's sponsor group. The governance structure should require arm's length appointments (e.g. see NavCanada & NATS models). Even if the different airspace user groups immediate interests may differ, their involvement in decision-making is likely also to improve commitment to the measures the airspace users need to take to implement any capacity improvements.

Administration cost: It is expected that this option will include all the same administration costs as mentioned for the previous option. It is not expected that the participation in the Board will increase overall costs as Board members are normally compensated for their work and this is funded through the route charges cost base as today – unless the ANSP decides to increase the

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overall number of Board members, in which case the cost of three additional members would be incurred. Additional independent expert support might also be sought by airspace users and wider consultation would still be necessary (see the NAV CANADA model). It is expected that no new staff would be needed but the three persons from the current staff within their stakeholder groups would have a new task to participate in ANSP board meetings a few times a year. It is expected that the additional administration costs will be negligible.

Regulatory costs: No regulator costs are expected to be incurred as the arrangement takes place directly between the ANSP and the airspace users.

Social impacts: As in previous option, the social impacts may flow from the changes to working conditions or reduction of staff necessitated by the efficiency measures or technology changes. Since the stakeholder influence is expected to be stringer, also the social and employment impacts may be somewhat higher.

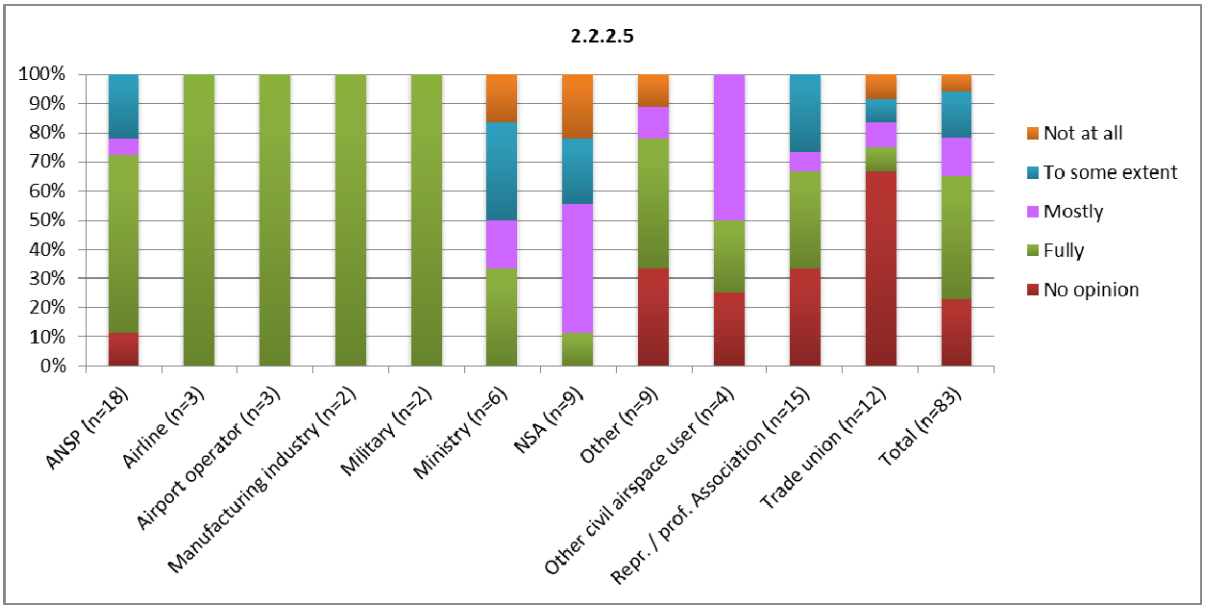
Safety: As in previous option, the airspace users and ANSP share the same safety objectives, so it would be unlikely for any safety impact to occur, except for potential improvements through new technology or procedures.

Employment: As in previous options this may cause loss of employment being driven by airspace users through any additional cost reductions, which will be offset by employment increase at airlines and in the wider economy.

4 INEFFECTIVE ROLE OF NSAS

As described earlier, the EASA audits have revealed a considerable problem in the resourcing of the National Supervisory Authorities (NSAs) and also on their independence from the ANSPs they are intended to oversee. The variance in NSA competencies and expertise was also noticed by the respondents to the public consultation, where the proposal for EU action to ensure a harmonised approach between NSAs received overwhelming support from the ANSPs, airlines, manufacturing industry, militaries and even to a considerable extent from the States ministries and NSAs:

Figure V-3: Stakeholder consultation question on whether EU should legislate to ensure more coherence amongst State authorities.



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Based on this different options for improving NSA expertise, resources and independence are considered below.

Option 3.1 – Do nothing.

Description: This would retain the current situation, where NSAs are underresourced and often dependent on the ANSP's they are supposed to oversee.

The advantages and disadvantages of this option may be summarised as:

Pros

- Low-cost, minimum effort for States on the short term.
- Convenient for States that only want functional separation.
- EASA may already require a corrective action plan from States to address staff shortages (which would increase the States effort in longer term anyway).

Cons

- Inadequate resourcing of NSAs manpower and skills.
- Insufficient oversight creates increased safety risk and sub-optimal functioning of the performance scheme.
- Problems persist both nationally and with cross-border and FAB level oversight.
- Possibility of sanctions for inadequate NSA resourcing (infringement procedures).

Risks

- Problems with NSA resources will eventually inevitably lead to safety issues in the organisations to be overseen.
- Furthermore as long as the NSAs are dependent on the ANSPs for resources, they will be encountering a conflict of interest in administering the performance scheme.

Under this option, the major issues facing NSA development would not be addressed. Inadequate resourcing would continue to be a barrier to full and effective NSA operation, not only in terms of manpower but also technical skills. The EASA audits and required corrective actions may enforce initiatives from NSAs to solve the resourcing issues, but this correction would come late, de uncoordinated and perhaps cause unnecessarily high costs if it would be implemented in a hurried manner instead of proper planning. The manpower deficit continues as the dominant issue, with significant shortages having been reported. This has, in certain cases, been solved by secondments from ANSPs, but this inevitably represents a high-cost temporary solution and is legally dubious vis-à-vis the requirement for NSAs to be independent of the ANSPs. While it ensures that NSA staff members are technically up-to date, it also has the capacity to weaken the independence of the regulatory body.

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In terms of technical and professional skills, the November 2012 NSA Peer Review Report indicates a deficit in training capacity for NSA functions. This is a serious problem, as it influences the capability of all new NSA staff members.

The institutional situation of NSAs is also mixed. Seven of the 32 NSAs referenced in the Peer Review Report reported that they are functionally separated from their service-provision counterparts, while the remaining NSAs have reported more complete separation (institutional/organisational). However the evidence from some of the initial EASA audits casts some doubts on how complete that separation is even when institutional/organizational separation has been reported

Taking these factors together, functional separation may generally be seen as a sign of inadequate NSA development, though it does not always automatically preclude proper resourcing. France shows by far the highest NSA resourcing level, and has a well-developed and recognised NSA in operation, despite it being only functionally separated from its service-provision counterpart. That said, even the French NSA uses secondments from its ANSP to ensure adequate staffing.

The resourcing and skills issues mentioned above limit the ability of NSAs to address issues relating to safety and performance of the ANSPs. Whilst we have still very good safety levels, aviation safety cannot be built on a single safety net, but must include several layers of safety nets and oversight arrangements.

Art 4(4) of Regulation 549/2004 already requires that "Member States shall ensure that NSAs have the necessary resources and capabilities to carry out the tasks assigned to them.", which places the responsibility firmly on States to find effective funding and resourcing solutions for NSAs, and equally carries the possibility of sanctions being applied in cases where this is not done. The interviews of NSAs have not been able to clarify why some States have not availed themselves of the possibility to gain adequate resources through route charges if the budgetary means are insufficient. It was however speculated that this may be due to a combination of States being disinterested (not a pressing issue), lacking motivation and that NSAs were not mature enough to press the issue.

Taken overall, a Do-Nothing option contains unaddressed risks. Through its Universal Safety Oversight Audit Programme, ICAO has identified a strong correlation between inadequate safety oversight and poor safety performance (evidenced by accident and incident rates). This therefore supports a conclusion that measures should be taken to enhance safety oversight at every opportunity. The EASA audits of the first five NSAs in 2012 also indicate many shortcomings in their supervision stemming from either a lack of resources or a lack of independence. Therefore it is only possible to achieve both maximum performance in service-provision and optimal levels of safety if fully effective regulatory oversight is applied.

Option 3.2 – Introduce mutual co-operation and EU-level co-ordination and pooling of experts

Description: This would introduce a strengthened EU-level co-operation between the NSAs, thus allowing them to exchange best practises, participate in trainings and take advantage of pooling of national experts under EASA auspices in the same manner as is being started for air operations and airworthiness experts.

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The main advantages and disadvantages of this option may be summarised as:

Pros

- Addresses staff shortages in an efficient way.
- Strengthens cross-border (FAB) oversight.
- Levels oversight capabilities.
- Helps NSAs meet objectives for safer transport by considering end-to-end safety of flights within Europe.

Cons

- Potential legal barriers that need to be addressed.
- Requires funding arrangements.
- Language issues.
- EASA remit does not address all aspects of performance scheme.
- Possible conflict of interest in EASA providing support and performing inspections at the same time.

This option exploits the opportunities for further cooperation between Member States, as well as coordination at the European Community level, including under the auspices of the European Aviation Safety Agency (EASA). Many NSAs are still developing their organisations and capabilities, nine years after their establishment under the first SES package. Until now, their access to common information has been via common support forums, including the Peer Review system. Although a means of assessing progress, the way the Peer Review system was applied did offer an element of learning and exchange of vital information. However the peer reviews had their problems as means of regulatory oversight because they relied essentially on voluntary reporting, which is why they are now being discontinued, and replaced with the EASA Standardisation Programme which, being a more formal audit-based system, does not offer the same support benefits.

Cooperation between States, including the exchange of, and pooling of, personnel has the potential to be an effective and efficient mechanism for dealing with resource deficits. EASA is already setting up a system for pooling experts, starting in the fields of airworthiness and air operations. It also greatly assists cooperative learning and exchanges of information and best practice between equivalent regulatory organisations, helping to redress deficiencies in NSA skills areas leading to a more consistent approach to safety oversight. Moreover, it is possible to consider resource-pooling arrangements constructed around FABs, with an NSA for each FAB with inter-state agreements on its operation.

One of the survey questions was whether other organisations could support NSAs, such as other NSAs or organisation with similar expertise. However there was no overwhelming support for this idea, presumably because already today the amount of different organisations and forums is causing confusion amongst the stakeholders:

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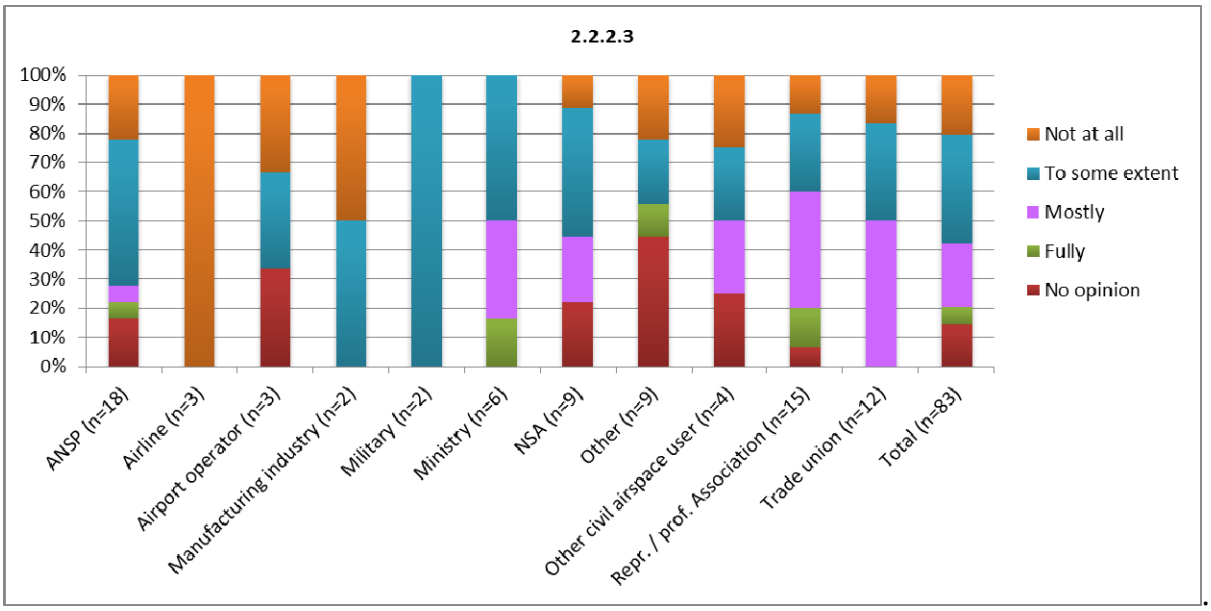
Figure V-4: Stakeholder consultation question on whether someone else than EASA (or future European Aviation Authority) should be entrusted with supporting the NSAs



Undertaking such cooperation brings some practical challenges. External support must operate within national legal frameworks and systems. Differences in language also have to be overcome. In addition, funding arrangements must be agreed to cover the additional costs.

Nevertheless additional budgetary resources are not forthcoming in the Member States and the increasingly cross-border nature of service provision in FABs requires also the authorities to migrate their oversight to an international level. Increasing NSA capabilities in this way increases regulatory effectiveness which, in turn, improves safety performance not just in ATM but, as a result, across the aviation system. Such a total system approach to safety is consistent with EC objectives in putting the airspace user at the centre of the transport system. It will also support key ATM safety objectives including oversight of the implementation of a Just Culture environment.

Significant NSA resources do exist in a small number of States. Though necessary for national commitments, the potential nevertheless exists for smaller NSAs to buy-in the expert resources of larger NSAs and support bodies, and to exploit them as potential training grounds. Such a pooling arrangement would also give the ANSPs the possibility to specialise and share tasks. The key issue governing feasibility of this approach is availability of Member States funding, and mechanisms to provide solutions here are urgently required.

Coordination at the EU level is vital in ensuring a standardised approach to safety oversight. In this regard, Commission Implementing Regulation (EU) No 1034/2011 on Safety Oversight in ATM and ANS has provided a common, high-standard benchmark for the safety aspects of NSA operation. Comprehensive Guidance Material is also being created to support this Regulation but consultation feedback has demonstrated the need for this material to be effectively supported and promoted, and further complemented as necessary. EASA can play a central part in such a process of developing and maintaining acceptable means of compliance and guidance material. However it should be noted that economic regulation is likely to remain outside of EASA's remit for the foreseeable future and this aspect has to be covered in the context of the Performance Scheme.

Cost efficiency: Cost efficiency will only be optimised when all aspects of SES are operating to their fullest extent. This includes a supervisory environment ensuring that all ANSP developments

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and operations are fully compliant with applicable regulations. More importantly the performance scheme hinges on the national authorities being independent and expert enough to assess their ANSPs performance and to set realistic, but ambitious targets on them. Hence effective NSA operation is expected to have a positive effect, although this is difficult to quantify.

Flight efficiency: As for cost efficiency NSA skills play an important role in ensuring the ANSP delivers optimal performance.

Capacity/delays: As for cost efficiency NSA skills play an important role in ensuring the ANSP delivers optimal performance.

Administration costs: It is not expected that this option would have any impact on ANSPs administration costs.

Regulatory costs: Currently, the NSAs are required to increase their staff by approximately 25% on average in order to tackle the existing staff shortages and fulfil the legal requirements. The current understaffing in the European NSAs is at the level of 104 FTEs in total[159]. It is assumed that under the do-nothing option, EASA audits would require corrective action plans to solve the staff shortage problems. Hiring new staff for all these positions is expected to cost the NSAs some € 17 million.

The option is expected to bring a mechanism allowing on expert pooling between different NSAs. This solution would bring cost savings. It is assumed that the average costs of employment of one person at an European NSA is € 162,000 annually[160]. It is expected that the expert pooling mechanism would not solve the entire staff shortage problem but that it would solve the problem in 50%. It is expected, therefore, that this option brings a decrease of costs for NSAs on national level due to lower staffing numbers on national level and significantly decreases understaffing (by 50%). It may be expected that the experts who form part of the expert pooling between the NSAs would require additional training (i.e. languages) and it is further assumed that the average budget for training for each of the experts would be € 10 000 per year. Additionally, as the expert pooling would require a coordination mechanism, a slight increase of costs on the EU level is expected. Finally, it is expected that experts would travel within the FABs to support other NSAs. It is assumed that the experts being part of the pooling would travel once in two months for an average period of 14 days. The subtotal costs of travels per expert would equal € 3800 per trip[161]. The option is expected to bring cost savings compared to the do-nothing option of some € 6.5 million in total on the European level in the first year. The detailed calculations are presented in in the table below. As said above, it is expected that option will not only bring the decrease of costs but also an increase in oversight quality.

Figure V-5: Comparison between Options "do nothing" and "EU level support & co-ordination and pooling of experts"

	Do-nothing	Option 1
Expert pooling - staff & training		
Costs of employment (EU average)	€ 161 951	€ 161.951

159 Report on the SES Legislation Implementation (Reporting period January/11 - December/11) produced by EUROCONTROL upon request of the European Commission DG-MOVE

160 Costs for supervision in France and Germany for 2011 corrected for overheads and adjusted to EU 27 averages based on GDP per capita expressed in PPP

161 An average trip within Europe for 14 days, including 14 per diems of € 250 plus € 300 for the travel

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Impact of expert pooling on staff needs (in%)		50%
Staff required to fulfil obligations	104	52
Staff costs required to fulfil obligations	*€ 16 842.862*	*€ 8 421.431*
Additional training costs (i.e. languages) per person	€ 0	€ 10.000
Additional training costs (i.e. languages) in total	*€ 0*	*€ 520.000*
Additional annual travels per person	0	6
Average costs per trip (2 weeks, EU flight, full DSA)	€ 3 800	€ 3 800
Additional travel costs (mainly within FABs) per person	€ 0	€ 22 800
Additional travel costs (mainly within FABs) in total	*€ 0*	*€ 1 185 600*
Tool - Mechanism for expert pooling on EU level	*€ 0*	*€ 5 000*
Costs of employment (EU average) of 1 person per year for coordination of expert pooling	*€ 0*	*€ 161 951*
Organisational separation		
Additional admin staff	0	0
Costs of admin staff per annum	*0*	*0*
Total costs	*€ 16 842 862*	*€ 10 293 982*
Net saving		**€ 6 548 881**

Environmental impact: Improvements in flight efficiency may result in corresponding improvements in reductions for emissions.

Social impacts: An increased number of job opportunities for highly specialised operational and engineering staff would be opened. This would favour experienced staff from the ANSPs and give some balance to the reductions in ANSP numbers arising from the performance scheme.

Safety: There is a well-known link between oversight quality and safety levels, so any increase in NSA quality can be expected to improve safety levels.

Employment: Since a significant shortfall exists in the NSA human resources, any measures to improve the situation will also increase employment opportunities. These opportunities would probably contain similar job profiles as the redundancies in the ANSPs so some cross-feeding may take place.

Option 3.3 – As option 3.2, but also institutional separation of NSAs from the ANSPs

Description: This option would combine the EU-level co-operation of previous option, but add an explicit requirement for the NSAs to be institutionally separated from the ANSP's that they are intended to oversee, in order to ensure full impartiality and independence.

The main advantages and disadvantages of this option may be summarised as:

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Pros

- Adequate separation provides assurance of autonomous NSA operation.
- Definition of separation criteria can form a commonly agreed basis for independence.
- Strengthens independence of NSA to challenge ANSP towards better performance and safety.
- 'Explicit Independence' could ensure 'true' separation.

Cons

- Requiring yet another change to NSA scope while most of them are not yet on full speed after 9 years under current scope.
- Harder to retain the best staff who may prefer secondment to the NSA rather than permanent transfer. In most States the ANSP pay levels are higher than at the authority.

Risks

- Considerable political risk as the States that still have only functional separation will oppose any new measures.

This option follows the model of the previous option for co-operation and pooling of resources, but adds to it a requirement for full (institutional) separation of the NSAs from the ANSPs that they oversee. Currently Art 4(2) of Regulation 549/2004 requires "*adequate separation at the functional level at least*" between the NSAs and ANSPs.

In practise most States have followed standard aviation practise and established a level of separation that goes beyond functional. Under Institutional Separation, the service-provision and supervision entities are fully separated and constitute formally independent legal personalities with complete autonomy for the activities they perform. This level of separation gives ultimate clarity in terms of legal and operational responsibility. Here, the "separation criteria" are not only met, but built in to the institutional structures. a number of key "separation criteria" have been met, and are seen to have been met. These criteria may be summarised to include:

- Separate legal personality and organisational structure to the extent needed for the NSA to assess compliance with regulations and take appropriate action in cases of non-compliance;
- Separate reporting lines in the NSA and authority (except possibly at ministerial level).
- Funding and staffing arrangements which are separate so that they do not hamper or in any way restrict the NSA in performing its duties, and ensure independence from pressure from the ANSP;
- Leadership and budget of the NSA to be set by the State's Parliament or similarly independent entity.
- Separate public identity, including publicity and communications arrangements;
- Visible empowerment from the national governing body (Parliament, Ministry);
- Stringent requirements on individuals for independence.

Cost efficiency: There could be a strong impact on cost efficiency if NSAs, or at least that component of them dealing with the performance scheme, were to be institutionally separate. This might have a similar effect as the Performance Scheme Option 3 (i.e. a cost reduction of around

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€ 150 million per annum), and should at least serve to support the performance scheme options 2 or 3.

Flight efficiency: As for cost efficiency there is likely to be a positive effect with greater NSA independence.

Capacity/delays: As for cost efficiency there is likely to be a positive effect with greater NSA independence.

Administration costs: It is not expected that this option would have any impact on ANSPs administration costs.

Regulatory costs: This option includes the previous option 2 and additionally, it imposes an organisational separation between the NSAs and ANSPs. All of the regulatory impacts of option 2 will thus be applicable to this option as well. Additionally, the organisational separation will result in the increase of regulatory costs by creating new organisations in these countries, where currently there is no organisational separation. According to the 2011 SES implementation report (published June 2012), there are a total of 37 NSAs in the 29 SES States. A Number of States have a small separate NSA for example to oversee meteorological services. In four States the main NSA is functionally separated and in four other States the main NSA is fully separated, but either Met or AIS NSA is functionally separated. There are also a total of 28 fully separated NSAs in 29 SES States[162]. This implies that the costs of employment would increase for these 8 NSAs in order to separate them organisationally from the ANSPs. It is assumed that on average 10 additional administrative staff would be hired in each of these NSAs[163]. The costs of employment of these staff are assumed to be at the level of 2/3rds of the NSAs European average as presented above. The option 3 is expected to bring additional costs of some € 0.9 million in total on national level in the first year. The detailed calculations are presented in the table below.

Figure V-6: Comparison between the "Do nothing" and "Option 2 + full separation" options

	Do-nothing	Option 3
Expert pooling - staff & training		
Costs of employment (EU average)	€ 161 951	€ 161 951
Impact of expert pooling on staff needs (in%)		50%
Staff required to fulfil obligations	104	52
Staff costs required to fulfil obligations	*€ 16 842 862*	*€ 8 421 431*
Additional training costs (i.e. languages) per person	€ 0	€ 10 000
Additional training costs (i.e. languages) in total	*€ 0*	*€ 520 000*
Additional annual travels per person	0	6
Average costs per trip (2 weeks, EU flight, full DSA)	€ 3800	€ 3800
Additional travel costs (mainly within FABs) per person	€ 0	€ 22 800
Additional travel costs (mainly within FABs) in total	*€ 0*	*€ 1 185 600*
Tool - Mechanism for expert pooling on EU level	*€ 0*	*€ 5000*

162 https://www.eurocontrol.int/sites/default/files/content/documents/official-documents/reports/2012-sesreport2011.pdf

163 The figure is likely to be less for the small NSAs – especially if they are merged into the main NSAs, but equally larger for the large NSAs so the figure of 10 is an average.

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Costs of employment (EU average) of 1 person per year for coordination of expert pooling	*€ 0*	*€ 161 951*
Organisational separation		
Additional admin staff	0	80
Costs of admin staff per annum	*0*	*€ 8 581 760*
Total costs	*€ 16 842.862*	*€ 18 875.742*
Additional costs		**€ 2 032 880**

It is expected that other issues from a requirement for full independence as sketched in the option definition above, do not come at an additional cost compared to the do-nothing option.

Environmental impact: Improvements in flight efficiency may result in corresponding improvements in reductions for emissions.

Social impacts: As in previous option, an increased number of job opportunities for highly specialised operational and engineering staff would be opened. Additionally a small number of additional administration staff would be required in 8 NSAs to transfer operations to a fully independent NSA. This would favour experienced staff from the ANSPs and give some balance to the reductions in ANSP numbers arising from the performance scheme.

Safety: There is a well-known link between oversight quality and safety levels, so any increase in NSA quality can be expected to improve safety levels.

Employment: As for previous option, but additionally an estimated 80 posts would open in the newly independent NSAs.

5 PERFORMANCE SCHEME GOVERNANCE MECHANISM

The performance scheme is perhaps the most complex mechanism being considered in this impact assessment. It involves a number of actors, each with their own interests and often conflicts of interests. More importantly the mechanisms by which the different factors (cost, capacity, flight efficiency and safety) interact are delicate and involve numerous variables. A certain amount of experience has been gained during the years since the performance scheme was created:

Context[164]

Cost efficiency: During the target setting process for the first reference period cost efficiency was the greatest area of debate. Being natural monopolies, the ANSPs will continue to be cost-inefficient unless regulated. It is realistic to assume that in the current system with State intervention it may be difficult to achieve a higher level of ambition than minus 2% per year reduction in costs. At the same time the PRB/PRU considers that an annual minus 5% is possible over the next decade as there is considerable duplication of costs and inefficiencies built into the current programmes. To achieve a target profile of minus 5% regardless of traffic evolution would

[164] Unless otherwise mentioned the figures and assessments in this part come from the Performance Review Body, which has been set up to study and advice the Commission on ATM performance matters.

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mean delivering an annual extra benefit of around € 300 million in ATM cost efficiency. Naturally this benefit would not be linear as it involves some up-front investment and depreciation of old infrastructure before the full benefits start to accrue.

Flight efficiency: Indirect losses generated by the system are currently assessed by the PRB at € 3.8 billion per annum. The current performance target is to improve flight efficiency by 0.75% in 2014. Already today it can be observed that it is unlikely that this modest target will be achieved.

The primary gains to be made in the area of flight efficiency are a small contribution from horizontal flight efficiency[165] and a much larger gain in the vertical profile by reducing level-off periods, which are wasteful in terms of energy management of the aircraft[166]. There are also gains to be made in the ground management of aircraft[167] and the whole loss is roughly divided in equal portions.

As for cost efficiency, more ambitious EU-level target setting and greater challenge at the State level should lead to higher targets being set for flight efficiency. However flight-efficiency is an area, where much greater potential exists for improvement. Already in the RP1 target setting, the PRB provided the following view of flight efficiency[168]:

Estimated inefficiency actionable by ANS	Fuel/flight	Fuel total	CO2 total	%
Estimated avg. Within European airspace	4.5t	42Mt	133Mt	100%
Horizontal en route flight path	169kg	1.7Mt	5.4Mt	3.9%
Vertical en route flight profile	25kg	0.3Mt	0.8Mt	0.6%
Airborne terminal	51kg	0.5Mt	1.5Mt	1.1%
Taxi-out phase	32kg	0.3Mt	0.9Mt	0.7%
Total	277kg	2.7Mt	8.6Mt	6.2%

At the time the PRB regarded the above numbers as a theoretical maximum under the existing system, as in practice a large number of factors need to be accounted for, such as the availability of airspace, the interaction of meteorological factors and trade-offs between flight level and capacity (due to sector configuration strategies). The table also includes vertical flight efficiency, which impacts fuel burn but less the flight time. Based on PRU figures for 2011, the consultants have

165 The extra distance flown horizontally due to sub-optimal routings, avoiding restricted areas etc.

166 Each aircraft has an optimal combination of speed and power setting at which it requires least fuel to climb. Similarly for most aircraft, the most fuel-efficient descent would be a gliding descent. Finally the current routings may involve several intermediate climbs and descents during the cruising phase, all of which cause additional fuel burn and delay:

167 Typically suboptimal taxiing routes, waiting with engines running for e.g. de-icing or for turn to take-off. It is common for an aircraft to burn several hundred kilos of fuel during taxi, so the combined result of these inefficiencies can be considerable

168 Table 4-1: ANS impact on fuel efficiency (PRR 2009) reproduced from the PRB's 'Performance Scheme: Initial EU-wide Targets Proposals', August 2010.

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estimated that the 0.6% figure above costs airspace users an additional €135M per year above the theoretical optimum, based on fuel costs of €0.6 per kg[169]:

Phase of flight	Average additional fuel burn (kg)	Cost per flight (€)	Total for all flights
Enroute	6	3.6	€ 35M
Climb	3	1.8	€ 18M
Departure	14	8.4	€ 82M
All	23	13.8	€ 135M

If the remaining flight inefficiencies are valued based on the average cost of 1min of delay (€81 in 2010 prices) the total flight inefficiency would be an annual additional cost of around €4B. Hence even a 50% improvement might generate benefits approaching €2B per year. Whilst the exact amount achievable needs further study, the PRB has indicated that this level might be achievable.

Experience from targeting setting on flight efficiency during this reference period has shown that more can be done in this area but an important countervailing action exists in the cost efficiency area where different charging levels dictate that aircraft are routed around areas of high cost thus negatively impacting on flight efficiency[170]. It can also be observed that at times routes have been generated by ANSPs or Member States to maximise return instead of reducing flight times. Another example is that we are aware of moves by some Member States to agree that where routes are moved due to flight efficiency reasons, the plan is that compensation charges would apply to reduce the financial loss on the state/ANSP losing the profitable route. This is utterly counterproductive. The purpose of changing the route is to reduce costs not maintain them - thus this will need to be countered.

However as the people who are ultimately responsible for setting the target are also the people who are agreeing to the rules, it is likely that flight efficiency improvements will continue to generate very little in savings for airlines. By maintaining the current target profile the ANSPs/states would maintain the current indirect costs of approx. € 4 billion per year and transfer indirect cost to direct cost through these counterproductive cost transfer mechanisms. Savings estimated by the PRU in the area of € 1 billion per year are possible by achieving slightly higher targets. Effective targets would need to take into account also vertical flight efficiency. This would suggest that an overall flight efficiency target of 2 % could achieve approximately 1.5 billion € in airborne savings and application to the ground of taxi-time management targets could achieve at least an additional 0.5 billion € if measures were introduced across all necessary airports. (i.e. airports where taxi times are constricted) To achieve these levels of efficiency with additional gains of total 2 billion € per year would require removal of state interference in the target setting process.

Capacity: Capacity management effect is centred on the core of Europe and a small number of outlying states who have a large effect on the network[171]. Most European states are not capacity limited except during exceptional conditions such as strikes, weather disruptions etc. Therefore

[169] PRU Technical Note, 'Vertical Flight Efficiency', March 2008.

[170] See for example the "Tango routes" controversy: http://news.bbc.co.uk/2/hi/uk_news/england/7124021.stm

[171] Typically south-eastern Europe has persistent capacity issues, despite being outside the busiest airspace formed roughly by the London-Paris-Frankfurt triangle

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there is to a certain extent an overcapacity in Europe as some states over-deliver because of geographical location. Thus the targeting here becomes critical on key states and it is here that problems occur as one of the key problems is aircraft routing where routes are sometimes fixed by ANSPs/states to maximise income. Programs such as free route airspaces have shown that where they are applied, capacity and flight efficiency are both affected and improve performance. However, as with all operating systems there is a cost to adjust capacity and the closer one gets to the economic optimum the higher the marginal cost becomes. The primary question here is therefore how much users are willing to pay for incremental capacity improvements. Delay can be further increased but there is a corresponding increase in costs as well due to required investment etc. As a rule of thumb experts use that 1 min in average ATFM delay costs € 1 billion in the end to users. Cost optimum models used by the PRB suggest we could achieve 0.35 min delay and this would be estimated at € 350 million. On the understanding that it is unlikely to achieve target levels lower than the current target level, which is 0.5 min delay, eliminating Member State intervention will generate additional savings of € 150 million per year.

Environmental and noise impact: Any improvements in flight efficiency will deliver also corresponding emissions benefits and they reduce the unproductive engine running time and hence fuel burn and emissions. That said, it must be noted that due to the trade-off between emissions and noise when using optimal climb and descent profiles, this would somewhat concentrate additional noise around the immediate vicinity of airports. As discussed under flight efficiency, the PRU has estimated that there is a 6.2% inefficiency actionable by ATM. Furthermore, it estimates that this equates to 8.6 million tonnes of CO^2, based on simple ratios between fuel burn and quantity of emissions (see: 'Standard Inputs for EUROCONTROL cost benefit analyses', 2007. Note that other pollutants have much smaller ratios to fuel burned: NOx = 10.3 kg/tonne fuel, SO^2 = 1kg/tonne fuel). Extrapolating this value to the ranges determined for flight efficiency, the range in CO^2 reduction is likely to be between 0.2 – 4.3Mt.

Safety: currently it appears that the performance scheme has had no impact on safety levels. However it becomes increasingly important to enforce also the safety aspects of the scheme as targets are made more stringent and the temptation to take safety shortcuts in order to reduce costs may grow.

Option 4.1 – Do nothing

Description: This would retain the current situation, where targets are set, but Member States continue to defend their ANSP's and the likelihood is high that national targets remain below European targets and even those are not achieved in reality.

The main benefits, disbenefits and risks identified for this option are:

Pros

- Least political opposition
- Reference Period 1 (RP1) could be regarded as a trial and the mechanism may work better in RP2 through better execution (lessons learned).

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- There is a possibility that external industry pressure on the PRB would occur even if the PRB/PRU were to be split from Eurocontrol, as the main source of benchmarking information is from service providers.

Cons

- ANSPs and Member States will try to influence PRB/PRU activities. This could impact target setting, performance plan assessment and objectivity of analysis of past performance.
- ANSPs and Member States will push for less stringent targets throughout the comitology process, as was witnessed in RP1 and RP2 revision discussions.
- Airspace users have an increased feeling of lack of effective control of ANSPs.
- Slower rate in achieving performance improvements to EU network.
- Concerns that FAB level targets proposed for RP2 will have the unintended consequence of slowing down the performance scheme where the Member States are unable to agree on, e.g. asymmetric cost reductions.
- Corresponding reduction in anticipated macro-economic impact.

Risks

- Not seeking to strengthen target setting process undermines achievement of other reforms.
- Repeated disappointment in the performance scheme redirects the ATM community effort elsewhere.
- Target setting would work better if incentives driven in ANSPs – i.e. Opportunity for gain/pain share.

As regards target setting, the 'Do nothing' option should assume that the following changes will be implemented as currently planned:

- The performance scheme will follow the current proposals for RP2, including the proposed new schedule[172.]
- New PRC Members selected under the current system at or around the start of RP2.

In this option, the PRB and PRU may be subject to continued pressure from Member States and the industry more widely. This may increase if the targets are made more demanding and also prior to RP2, where shortcuts in RP1 (such as deferred investment) need to be addressed in RP2. Also, as Eurocontrol becomes more operationally focused around the Network manager, the PRU will increasingly be exposed to day-to-day industry pressure. The option is likely to result in:

Cost efficiency: A continuation of the "lowest common denominator target" being agreed by the Single Sky Committee would be likely. Overall, it has been estimated by the PRB, that the cost efficiency targets could have been an additional 1-2% higher in ambition than actually achieved in RP1.

[172] PRB, 'Report on the preparation of the revision of the SES Performance Scheme addressing RP2 and beyond', ver 1.0, 17 July 2012

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Flight efficiency: As such the option would be unlikely to cause much change in flight efficiency, unless delays become such an issue that aircraft need to be continuously rerouted. .

Environmental impact: Similarly to flight efficiency any impact would be a finction of capacity constraints force aircraft to fly longer routes.

Capacity/delays: Whilst the *do-nothing* option would not as such change the baseline situation, shortfalls in investment that may have been deferred during RP1 may come back to take their total on capacity-building measures during RP2. This would in turn cause more pressure to be more lax on delay targets during the next reference periods.

Administration costs: The option is unlikely to have any impact on current administration and **regulatory costs**.

Social impacts: Even the current performance scheme is expected to have a limited negative impact on employment and working condition. Even it is expected to lead to a moderate efficiency drive, so negative impacts on employment and working conditions cannot be fully ruled out.

Safety: Normally a do-nothing option should not impact on safety.

Option 4.2 – Reduced Member State involvement in the target setting process

Description: This option would reduce Member States influence in the target setting process by moving from the current regulatory comitology procedure to an advisory procedure and a stronger role for the PRB, both institutionally (located under the Commission to reduce outside pressure) and as an advisor.

The main benefits, disbenefits and risks identified for this option are:

Pros

- The conflict of interest arising from close relationship between Member States and ANSPs becomes less harmful as the States are further away from the target setting process.
- The option goes deeper than present benchmarking analysis by building capability of the PRB to make judgements on plans and potential for improvement.
- Commission nominated members reduce risk of suboptimal target setting and performance plan assessment.
- Commission is able to bring in experts to the PRB from outside aviation to get a different perspective.
- Greater accuracy in performance plans by more explicit linking of investment to unit rates.
- Enables SESAR investment to be monitored to demonstrate and adjust overall coherence.
- Creates transparency of investments that are part of approved SESAR deployment and those that are to continue current operations. Such transparency would then provide insights into the investment decision of ANSPs in respect of target setting and allow the Deployment Manager to be better informed of relevant issues.

Cons

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- If the capability of the PRU is not increased to cover more technocratic skills, there is a risk it becomes involved in protracted service provision arguments.
- May lose the influence of those Member States that make a positive contribution to the performance scheme.
- Despite measures to improve PRB independence, there will always be a degree of potential dependence from background of members as long as they are recruited from inside the ATM industry.
- Potential influence remains via PRU, which performs most of the analysis and data mining work for the PRB, as long as the PRU remains part of the increasingly operationally focused Eurocontrol.

Risks

- There is an increased risk of political opposition if Member Sates see this option more as a landgrab than a genuine attempt to improve the performance system
- Commission would also need to improve its understanding of the ATM system, if it is to appoint all PRB members.

This option is for less Member State involvement in the target setting process and a shorter overall process based on technocratic input from PRB. Additionally all PRB members are to be nominated directly by the Commission, (independent of PRC). Nomination of PRB members by the Commission gives the opportunity to oversee that the membership profile is balanced and also to include regulatory expertise from other industries. In this sense the PRB may become more like a Board of Directors with reduced ANS operational and business knowledge. It would therefore also require additional support in this area from the PRU.

Based on discussions with the PRU and PRB the set-up could be formulated so that:

- The PRB decisions would remain advisory.
- The PRB would be nominated by the Commission. A sub-option would be to move it organisationally under the Commission (currently it remains separate, although Commission pays for its budget)
- The PRU would increasingly focus on the EU performance scheme and possibly also include some level of functional separation from the rest of the Eurocontrol organisation. However it would remain part of Eurocontrol to ensure availability of Eurocontrol data to PRU.
- The current scheme for EU level target setting is maintained.
- The PRB proposes the EC nominal targets for Member States. Member States respond with an assessment of feasibility, performance plans and provide supporting documents to evidence the impact of the targets.
- Member States to supply the PRB with ANSPs business and supporting plans, (operating plans, detailed capital expenditure plans, staff plans, incentive schemes, long term (10-15 years) investment plans etc.), as well as performance plans, to support the PRB decision making. I.e. to allow the PRU/PRB to provide appropriate advice to the Commission and SSC, there must be no asymmetry of information between the PRB/NSAs, Member States and ANSPs.

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- In support of monitoring, ANSPs detailed capital expenditure plans to be made available to the PRB on an annual basis. Such plans should distinguish between SESAR deployment and other investments and be in a common format to enable comparison at the EU level.
- Investment plans must to be open to external audit rather than be wholly self-reporting as is the case with the current Eurocontrol LSSIP reports.
- The duration of the process would be shorter than currently planned for RP2. Final decision on plans and targets would be done in the Single Sky Committee on a Commission proposal, using the delegated acts procedure.

Cost efficiency: A change of decision making process from implementing acts to the new delegated acts procedure under the Lisbon Treaty is likely to allow for more ambitious targets being set at the EU level. This means that the targets may be set faster and they could be more in line with those advised by the PRB. At the level of national performance planning, greater consistency between the State and EU level is likely to be achieved. This means also that the component plans of States targets should reconcile with the EU targets. The development will be driven by increased transparency which creates a challenge to ANSPs business planning from a more technocratic PRB with access to the same information and assumptions. A PRB nominated by the Commission and embodied with more regulatory experience, including from other industries, should also serve to ensure more formal independence. The outcome of this more challenging environment should be higher targets set at the EU level, with performance plans to match at the State level. If the PRB was to be moved under the Commission, maintenance of this independence would be more guaranteed also for the future. Even assuming a partial achievement of the 1-2% tighter targets, analysis of the PRB has estimated that the cost-efficiency improvements compared to the current situation would most likely be in the order of € 300 million per year.

It could be conservatively considered that the effect of this option will be to deliver a cost efficiency target that stays annually 1.5% above that of the *do nothing* option. If for example, the Member States were normally to agree a target increasing at 3% per year for RP2, but with this option the target were to be 4.5%, the difference in costs would be ~€ 1500 million. I.e. the 1.5% might translate to a saving for airspace users of ~€ 1500 million for RP2, hence some € 300 million on average per year. If the PRB was situated under the Commission and hence separated more completely from industry interests, the likelihood of this improvement being sustained would probably be higher even if the maximal improvement itself would most likely not change in magnitude as it would be constrained by feasibility and social pressures.

Flight efficiency: As for cost efficiency, more ambitious EU-level target setting and greater challenge at the State level should lead to higher targets being set for flight efficiency. The effect may will be even bigger that for cost efficiency, as flight efficiency causes considerable secondary costs in fuel burn and delays to the airspace users.

Environmental impact: Any improvement in flight efficiency achieved by setting higher targets will directly and positively impact environmental emissions. There are no particular benefits in this option that would have an impact on noise, which is predominantly an issue for airport localities and includes a trade-off with emissions.

Capacity/delays: Also as for cost efficiency, more ambitious EU-level target setting and greater challenge at the State level should lead to higher targets being set for delays. There should also be

increased clarity of the trade-offs between capacity, operating costs and future investments. This should help ensure that capacity targets are set so as to be achievable and flexible in the long term, without being dominated by short term traffic decreases.

Administration costs: It is expected that the administration costs to the ANSPs would remain similar to todays situation, with perhaps minor increase in effort to deliver timely data.

Regulatory costs: This option is expected to have no impact on the direct regulatory costs on national level. It is expected, however, that as a result of possible increase of targets, the efforts needed from the NSAs on national level are also likely to be higher. The current PRB consists of 13 members. At present, the activities of PRB include mainly activities related to target setting (approximately 50% of the time), performance review[173], benchmarking and other activities. All of the activities of PRB members that focus on target setting are currently financed from the EU budget. The option assumes creation of a new PRB directly under the European Commission. The optimal number of PRB members in such a new set-up would equal to 7 members[174]. If it is decided to reduce the size of the PRB, the released funds could perhaps be redirected towards a refinement of the performance studies. However overall it is assumed that the nomination of the PRB members by the European Commission would not have an impact on the EU budget as their current activities related to performance setting are already being funded by the European Commission.

Social impacts: Enhanced targets will influence changes to working practices as ANSPs seek more flexibility in how they deliver their services, which may imply changes to employee conditions. Combined with the proposals for unbundling, this may overall lower job quality. This will affect all categories of staff, but may be most acute for engineering and administrative support staff due to the linked unbundling proposal and the fact that most of the additional cost tends to be in the support services. It is also likely to affect older members of staff with higher salaries, with a tendency by ANSPs to encourage early retirement. The impacts for staff will also be impacted by labour market conditions at the time, with engineering and administrative staff also those most likely to find alternative employment in other industries. This contrasts to the very specialised nature of air traffic controller jobs, where there is no potential to transition to other industries in the same or similar role. However it should also be noted that air traffic controllers are also least likely to be made redundant as traffic growth requires more controllers. Thus the effect for controllers will more likely be one of deferred growth of the job market.

Safety: Normally safety should not be impacted by the more ambitious performance targets as safety targets form one specific key performance area on which targets are being set. There will undoubtedly be concerns about cost cutting leading also to cutting corners in safety, but – provided the proposals for strengthening the NSAs are approved – the authorities should have ample possibilities to counter such tendencies and enforce the required safety management systems in ANSPs.

Employment: As noted for the social impacts, reduction in costs may lead to reductions in employment or at least deferred growth of employment in the ATM industry. To some extent this will be offset by corresponding growth in the airline sector, but overall the impact is expected to be

173 The annual performance review reports (PRRs) are done by the Performance Review Commission, which essentially enlarges PRBs scope to serve all Eurocontrol Member State and not just the EU

174 Information obtained from two interviews

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marginal on current work force as traffic growth on the other hand requires additional effort, which will compensate for at least part of the reductions.

Option 4.3 – Allow direct nomination of the PRB by Member States, but let the PRB set targets directly without comitology

Description: This option would reverse the scheme in the previous option by allowing the Member States to nominate the PRB, but doing so under strict independence criteria. The PRB would then directly set the targets without comitology.

The main benefits, disbenefits and risks identified for this option are the same as for previous option, but additionally:

Pros

- The option may satisfy any Member State concerns about whether the PRB really understands the ATM industry and create new credibility for PRB decisions amongst the States.
- Member States are able to determine the balance of ATM-industry insiders to provide the optimum level of understanding when setting more challenging targets.
- The comitology part of the target setting would be replaced by direct decisions, saving considerable time and avoiding dilution.
- As the States would trust the PRB more and consider themselves its owners, they might be more likely to agree to tighter targets

Cons

- It is unlikely that any non-ATM experts would be nominated as each State would have an interest to include its own ATM experts and there would not be seats for all states – never mind for more than one expert per State.
- The independence of the members would need to be overseen closely by the Commission and strict independence requirements would need to be set on the members.

Risks

- For the Commission there would be a considerable risk of letting go of the PRB. If the option backfires, the entire performance scheme could be paralysed for years until the legislation can be changed again. In that sense this is an "all-or-nothing" option

In this option the PRB members would be appointed directly by the Member States with requirements being placed on members independence in the same manner as happens for the European Central Bank. This would mean that de facto the PRB nominations would tend to be end-of-career nominations for distinguished sector experts as their return to active ATM duty outside the PRB would be restricted. Once nominated, the PRB sets targets directly with no comitology. The Commission has a right of veto on nomination and a right to disband the PRB if it

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becomes blocked. I.e. the PRB becomes a de facto regulator[175], determining EU targets and the consistency of State targets with them.

The effect of this option is to reduce the political influence of Member States and the Commission in minimising the ambition of EU level targets and placing an over-reliance on ANSPs in developing performance plans. As such, the PRB becomes an economic regulator that acts as a guard to ensure an outcome in terms of price levels and service quality offered to users that would be close to a situation in which ANS services would be provided on a market with under market principles.

Cost efficiency: If it works as planned, this option would be expected to deliver a greater cost efficiency impact than the do-nothing option, as the PRB is likely to advise more ambitious targets at the EU level and could not be overturned in comitology. As this option also includes a more technocratic PRU and access to business and supporting plans (to avoid asymmetry in information), a perspective on the feasibility of setting more ambitious targets should also be maintained. On the other hand the option carries a considerable risk in the sense that the PRB would then be poorly controlled if its internal dynamics would suddenly cause it to change direction. Therefore it is safest to assume that the benefits from this option would be similar to the previous option, but include a much higher uncertainty factor in both directions.

Flight efficiency: As with the previous option, the improved transparency of data will help improve flight efficiency and like for cost efficiency this option may allow for more "adventurous" target setting. That said, the option has its risks, so the result is not certain.

Capacity/delays: As for flight efficiency.

Administration costs: It may be expected that with harder targets, an increased effort is required also from the ANSPs, but the difference should be marginal.

Regulatory costs: Whilst the impact is not expected to have any additional impact on the EU budget (EU covers already today all PRB costs), the focus of EU level work will move from target setting to overseeing the functioning of the performance system itself to step in in the case of PRB becoming incapacitated.

Environmental impact: As for flight efficiency the potential of this option is greater, but so are the risks.

Social impacts: As for previous option.

Safety impacts: As for previous option.

Employment impacts: As for previous option.

6 REFOCUSING OF FABS

Option 5.1 – Do nothing

Description: This would retain the current situation, where FABs continue to develop slowly and miss performance focus as no legal motivator exists.

[175] Formally the targets are still Commission decisions and hence the Commission is formally the regulator

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The main pro's, con's and risks of this option have been assessed as:

Pro's

- Now that FABs are coming closer to formal establishment and if the performance scheme continues to push for efficiency, the FABs should start to deliver benefits under the motivation to meet performance targets.
- Politically a low risk solution vis-à-vis the States and ANSPs
- ANSPs in a FAB will naturally cooperate more than without them.
- Minimal new regulation required.
- Minimal disruption in those FABs that are further in development and avoids risk of FABs to losing what focus they currently have.

Con's

- FABs continue to deliver slowly if at all.
- Unacceptable to the airspace users, who see FABs as failures to provide benefits to customers.
- There is no strong incentive to move forward or address barriers.
- The SES targets are not achieved and where improvements are made, they could mostly have happened without the FAB as well.
- ANSPs are deploying SESAR based on the historic State level approach. This has failed in the past and might be repeated.

Risks

- Whilst the structures now exist or can be expected to be created in the near future, the remaining issues that risk delivery of improvements are:
    - Building commitment on the part of FAB members
    - Lack of prescription around the requirements
    - Finding a robust mechanism to share best practice
    - Enforcement of the regulations – in particular requiring FABs are indeed “implemented” defining what timeframe they need to be implemented in and what "implemented" means in practical terms
    - Funding the implementation phase
    - Defining the role of FABs relative to the NM – Network Manager and in SESAR
- If Commission does not take action now, the entire FAB concept may slow down and become marginalised.

The "do nothing" is based on the assumption that the FAB concept itself is sound and the FABs would as such be on the right track, but that they have just not had enough time or motivation in the 2004-2013 period to implement changes. It assumes that if the FABs were left to mature, they would start to realise operational benefits as the increased proximity and co-operation would lead the participants to discuss subjects such as common developments in infrastructure or joint ventures in support services or procurement.

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This option also assumes that the current legal framework is robust and clear enough to force States and their ANSPs into creating closer alliances once the initial governance arrangements have been made. Considering the limits of the current FAB-article, this would de facto take place under the performance scheme, with performance targets pushing the ANSPs to seek synergies wherever they can be most effectively achieved.

Whilst the 'Do nothing' approach could also be seen as the politically easiest option, it is so for the following problematic reasons:

- Currently the ANSPs operate in a secure environment as a State monopoly. They are unlikely to voluntarily tackle the difficult political and social issues the establishment of a fully functioning FAB will entail. In such a case FABs will continue to display limited vision, commitment and produce limited benefit, primarily confined to the airspace design aspect, which should already be increasingly in the domain of the Network Manager.
- Despite regulations, en-route revenues appear to cross subsidise TMA and aerodrome operations. The financial transparency and reluctance to cross-subsidise another States airspace, arising from FAB implementation will expose this leaving States to fund uneconomic services. Currently overflights by foreign carrier, form an important part of the income of a States ANSP, without causing a corresponding amount of work. Therefore the current system is often sees as subsidising local economy through foreign carriers. Accordingly there is an economic imperative precluding true progression to implementation of FABs.
- Member States perceptions around issues of sovereignty, national security and liability are currently not questioned.

These risks have been well recognised in the airline views, e.g. AEA position, that FABs should be based on "the needs of airspace users and not on national borders". Indeed the airlines are supportive of the concept of FABs but frustrated by the lack of progress in them.

Option 5.2 – Create more prescriptive and enforceable targets/criteria for FABs

Description: This would retain the current FAB model, but revise the criteria contained in Reg 550/2004, Art 9a, by making them performance focused and more prescriptive.

The main pro's, con's and risks of this option have been assessed as:

Pro's

- FABs can achieve significant benefits without focusing on ACC consolidation. They simply need more focus and direction.
- Reliance on targets alone is not sufficient. The plans underpinning the targeted performance need to be subject to scrutiny and on-going monitoring.
- Keeps existing FABs in place and refocuses them using an evolutionary approach, as opposed to revolution.
- Relatively simple to implement.

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- Requires FAB business planning to be much more robust by setting out clear criteria on process, content and evidence (i.e. hard plans rather than loose ambitions).
- Addresses the legal vacuum that currently exists on what FABs are meant to achieve and look like and when.

Con's

- Until FABs are established as operating entities performance measurement will be problematic and somewhat academic, being a simple amalgam of separate entities rather than a FAB.
- FABs are not focused on improving performance, but on complying with the formal requirements of a FAB. Changing the mind-set to establish urgency will be a challenge.
- Needs to be supported with a robust and effective enforcement mechanism to be effective.
- Most importantly this option duplicates the performance scheme, or alternatively replaces the FABs with the performance scheme.

Risks

- There is a risk of political opposition. States are finding ways to comply with the current rules and any new conditions would be seen as doing away with those efforts.
- May lead the Commission deep into micro-managing FAB developments.

The current list of FAB criteria in Art 9a of Regulation 550/2004 is problematic in two ways. Firstly it does not give the Commission the gatekeeper role to approve FABs or to send them back for rework. Secondly the criteria for FABs are very vague and can be debated by skilled lawyers to the extent of making infringement cases difficult to stick. A solution to this could be to accept the FABs for the time as they are, but setting a second deadline by which they need to comply with a much stricter and better defined set of performance based criteria. This would mean setting targets for the FABs, requiring them to present detailed implementation plans and business cases and organising regular and detailed review and approval process for them. The endorsement of these plans would need to be supported by not only the PRB, but also by the Network Manager for issues linked to Network operations and the SESAR Deployment manager.

A major feature of these plans would also be their standardised nature. Currently the plans and cost benefit analyses that have been made are not comparable with each other and in any case, without external scrutiny, they tend to be overly optimistic. A good example are the differences in NPV's of the FAB reports that were submitted under Regulation 176/2011. Considering all FABs should benefit from roughly similar co-operation gains, the benefits and their distribution varies wildly:

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Figure V-7: FAB reports on CBA benefits

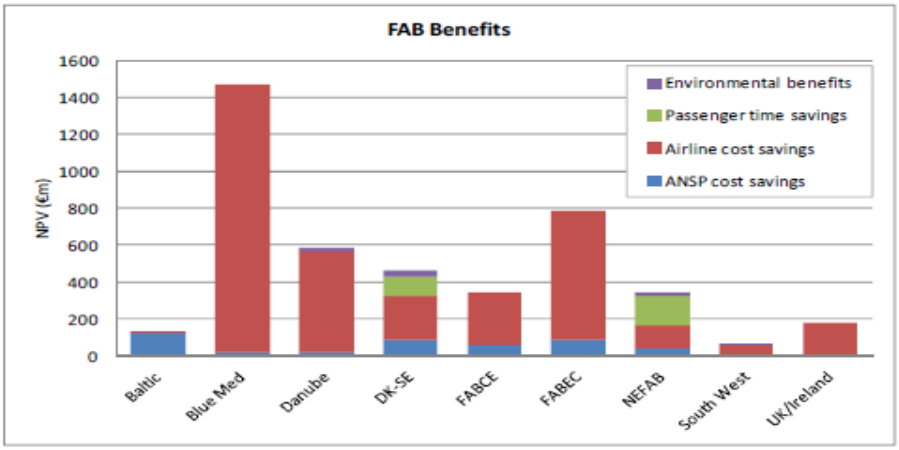

Figure 1 - Summary of NPVs

This level of optimism makes it also difficult to make a comparison with the baseline (above plans are formally what the baseline should be). As the figures above are for the most optimistic "do nothing" scenario, a cautious abatement of 25% has been performed on them for comparison purposes.

Cost efficiency: If tighter criteria were set down for FABs, it would make achievement of the stated targets more likely, even if not certain. The FABs will be held more accountable and the most unrealistic plans exposed as such. It is probably realistic to assume these factors will roughly balance each other out and the 25% abatement applied to the above-mentioned NPV of the original plans is reversed. This means that the NPV attributable to cost efficiency under this option is € 370 million, i.e. an improvement in NPV of approximately € 100million with this option compared to "do nothing", which translates to around € 10 million per year in benefits

Flight efficiency and environmental cost: the more stringent criteria would drive also achievement of flight efficiency gains, so a positive impact would be a natural expectations. However in the case of flight efficiency this impact is somewhat balanced by the fact that route design is a service best done at network level and hence it is increasingly covered by the Network Manager. The occurring benefit may therefore need to be at least partially attributed to the Network Manager.

Capacities/delays: all FAB plans deal with capacity, although it is not a major problem for all FAB'. It is reasonable to assume that those FABs that currently have delay issues will incrementally address them in the FABs, although as far as there are still separate service providers the decisions to procure new equipment or hire new controllers will be made at national ANSPs level. If the targets can be defined well, this could be alleviated to some extent by forcing the FABs to be more explicit about how delays are addressed and to plan also the interfaces with their FAB neighbours.

Administration costs: the more prescriptive FAB conditions will mean that FABs would need to put more effort into planning and complying with the new targets. This in turn brings an inevitable increase in administration costs.

Regulatory costs: If the FAB development leads to synergies being found e.g. though common provision of services, this will lead to changes in working considtions (e.g. working abroad part of the time) and to reductions in employment as several ANSPs are served by a shared resource. As

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with the performance targets this development will most likely affect engineering and administrative support staff, whereas the situation of controllers will stay stable.

Safety: There would most likely be no impact on safety, unless deeper ANSP co-operation leads to best practises being adopted by more ANSPs and hence better safety.

Employment: As noted for social costs, some downward pressure especially on engineering and administrative support staff is likely to happen. This option alone would however have a fairly limited impact compared to others and the redundancies have been estimated to remain at roughly 400 jobs, as the basic structures of FABs would in most cases probably remain as they are.

Option 5.3 – Creation of a more flexible and performance driven FAB-model

Description: This option would change the FAB concept towards more flexible constellations, where the FAB is seen primarily as a tool for performance and its success measured through the attainment of the general performance targets.

The main pro's, con's and risks of this option have been assessed as:

Pro's

- Overcomes the issue that five of the FABs are bi-lateral arrangements unlikely to achieve anything that could not have been done by one-to-one collaboration and the plans of the three larger FABs showing little evidence that they will deliver significant benefits.
- Consistent with the philosophy that the performance scheme sets the objectives and targets to be reached, but after that ANSPs are set free to achieve those targets as they best see fit and the EU intervenes only if targets are not met
- Consistent with the philosophy of the Network Manager having a network view and coordinating airspace from that perspective.
- Promotes the idea that FABs are not just about airspace and nearest neighbour collaborations but fundamentally a means to an end (performance).
- Encourages FABs to develop performance driven partnerships wherever they are located.
- Follows existing trends in ATM system collaboration such as COOPANS.
- Saving of the resources expended on the development of FABs, where the benefits would be marginal or negative.

Con's.

- Performance scheme monitoring needs strengthening and stronger line required on non-performance – otherwise nothing changes.
- There is a risk that the option could stall FABs or at least the FAB development would become less transparent as co-operation arrangements would exist at multiple levels and directions.
- FABs provide the potential for at least partial rationalisation and to realise this benefit of the FAB structure we should be careful not to undermine it. Whilst the FABs would not

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disappear under this option, they would become more complex and less easily managed interfaces for the Network Manager, SESAR, EU and Airlines.

Risks

- Whilst the option brings the possibility of enhanced co-operation and focusing of FABs on performance instead of formal compliance, it also creates a risk of diluting the FABs and losing whatever benefits have already been achieved in the traditional rigid FABs.

This option reformulates the FAB concept in order to focus it more strongly on creating additional performance and away from the idea of FAB as a political entity. Already in SES II the FABs were removed from the airspace regulation in the realisation that airspace configuration aspects are best dealt with at network level under the auspices of the Network Manager, and FABs should be seen as tools for improving performance. In that sense it is immaterial what their form is as long as they provide the necessary benefits to comply with the performance targets.

The basic idea of the performance scheme has been that it sets the objectives and leaves the ANSPs free to define the solutions. Thus the precise format of FABs would be defined in their CBA's, when deciding which forms of co-operation bring best value. Consequently it is also conceivable that some areas would be left outside the FAB co-operation if they do not come with the necessary performance improvements. This would in particular act against the recent trend where updates to the FABEC and Danish-Swedish FABs CBA's have seen their anticipated benefits revised substantially downwards.

It should also be noted that this option has a strong link with the option to extend the Network managers role as in that case all those functions, where the scale or level of action is important for the amount of benefits, would be co-ordinated at the highest level through the Network Manager.

Cost efficiency: Under the multi-directional FABs option it could be expected that the FABs focus on performance scheme. This may entail some initial costs as FAB plans are revised, but overall even a conservative estimate would indicate that FABs should be more likely to achieve at least the level of cost-efficiency as is estimated for the "prescriptive targets" option. As the prescriptive option hinges on top-down micro-management of business through a relatively rigid legal text and the "flexible FABs" option allows for quick adaptations and improvements as situations change, it should be safe to assume that the level of benefits will in real life exceed that coming from the prescriptive option. However the exact amount would depend rather on the performance scheme than the FABs option as the FAB is just a means to an end.

Flight and environmental efficiency: It is likely that a "flexible FAB" option will have some positive effect on this area, although most of the benefit will come from improved co-operation at a higher level under the auspices of the Network Manager.

Capacity/delays: The impact on capacity would probably be similar to the one in the prescriptive scenario. Through the FAB-cooperation the ANSPs would have more means to employ for improving capacity and the would also be better able to co-ordinate capacity efforts with their neighbours, but the two options do not differ in this sense, so the impact would most likely be identical.

Administration costs: Compared to the other options, the administration costs are most certainly similar. In each option some work has to be undertaken to set up a FAB and only the content of the FAB plans will be different as it is driven by different background motivators. The regulatory costs at EU level in this option are likely to be slightly lower than in other options, as oversight of the FAB initiatives would be primarily done through the performance scheme. That said, support for

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FABs would probably be needed just as much as before so the difference in the end will be insignificant.

Social impacts: As in the option for more prescriptive FAB targets, the efficiency measures and joining of forces between ANSPs is likely to lead to redundancies and changes in working conditions as the same staff members are used to serve several ANSPs and the technological infrastructure may undergo harmonisation.

Safety: No safety impact is expected.

Employment: This option would lead to some limited redundancies (estimated up to 400 redundancies) and changes in working conditions over time as FABs would seek synergies by combining their functions..

Option 5.4 – Top-down approach with a new entity created from the Network Manager and PRB to design service provision

Description: This option would be the most radical FAB-option as it would make FAB establishment and design a decision of a new EU-level entity. Only a limited number of FABs would remain and the concessions to run them would be tendered out regularly for fixed period contracts.

The main pro's and con's of this option are expected to be:

Pro's

- Provides the incentive missing to encourage pursuit of service excellence and efficiency.
- Transfers performance risk to service providers and gives airlines certainty on pricing.
- Much faster rationalization of service provision and consequent reduction in costs and user charges.
- Removes the issues of integrated approach to procedures and systems deployment across multiple States, something essential for success of SESAR.
- Optimised airspace design based on traffic flows.
- Promises highest possible defragmentation benefits.
- Seen as an opportunity by the more commercially focused ANSPs.
- All ANSPs can have the opportunity for participation in ownership of the operating entity through preferential shareholding.

Con's

- Such a radical change would be politically sensitive.
- Would require extensive preparatory work to define the option.
- Success would depend on the quality of regulation.

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- Over time the system could lead to an oligopoly of ANSPs (typically service provision in lower airspace is less profitable so only those that receive concession would survive in the long term), so anti-monopoly rules would need to be enforced firmly
- Will take a long time to implement fully (10-20 years)

Risks

- Risk of political stalemate is very high
- The success hinges on the ability of a single entity to design the entire European ATM landscape, instead of allowing multiple sources to compete for best ideas. If the single design entity makes a mistake, the resulting damages could be much larger than today when a single ANSP makes design errors.
- The most likely contenders for concessions (the 5-6 biggest ANSPs) are by far not the most efficient service providers in the EU. Therefore a high risk exists that solutions would be realised using the "lowest common denominator".

In this option the concept of FABs as a bottom-up construction is replaced with a New European Entity which would have responsibility for organization of EU ATS provision and regulation. This entity would be a combination of the economic and analytic expertise of the PRB, the network expertise of the Network Manager, the safety oversight expertise of EASA and, critically, a new body of expertise in concession management in the transport sector. Characteristics of the system could be:

- EU airspace above a certain minimum flight level could be divided into 4-6 contestable service delivery zones (concessions) based on an optimal configuration.
- A tender process would be held amongst certified providers for 10-15 year concessions, subject to meeting defined service specification and price criteria and compliance with defined investment plan.
- States provided with right to take control of national airspace where there is a defined threat to national security.
- Potentially the concession could have a pricing structure in which price is fixed with risk and reward transferred to operating entity. There would be a significant motivation to provide services below the target price to make profits.
- Operation, maintenance and development of facilities and infrastructure would remain subject to independent service and economic regulation by the new entity.
- Alternative would be to split the structure into infrastructure operating organisations and service organisations

Cost efficiency: There would be substantial costs to the ANSPs and to the EC, EASA, Network Manager, PRB and other agencies in re-organising a ‘top down’ approach, but also potentially a realisation of large cost efficiency benefits. Under this scenario a concession arrangement would start an immediate and extensive reorganisation of en-route service delivery. Of the potential savings identified in the 2006 Fragmentation Study, this approach would have the potential to realise savings towards the top end of the range in the area of ACC's by forcing consolidation. Further this approach would facilitate realisation of the other benefits identified in the study, especially in the area of harmonised infrastructure and procurement.

(oo)

The “top down” option would have the highest potential for realisation of the cost efficiency benefits. Under this scenario a concession arrangement could potentially derive rapid and extensive reorganisation of en-route service delivery. To quantify the impact, the delta between Merger versus the Alliance scenarios of the DK-SW FAB in the original CBA was assessed (since revised downward for the Alliance option). This is selected as it is the most definitive of the FAB business cases and one that clearly elaborates cost efficiency (as opposed to flight efficiency) benefits. Based on this approach, the Merger scenario drives an improvement in NPV of 246%. This is a significant increase, but needs to be seen in the context of the DK-SW FAB “Merger” scenario, a scenario which represents significant optimisation based on rationalisation of service delivery and procedures, similar to what may be expected under this option. Using this approach, the impact on the NPV for cost efficiency for all FABs under this option is € 683 million per annum. When compared to the potential savings of € 880 million to € 1400 million in annualised ANSP operating costs identified in the 2006 Fragmentation Study, the estimated savings are significantly below the lower end of this range, indicating that this may be a conservative estimate.

Figure V-8: Summary of fragmentation costs in the 2006 PRC fragmentation study

	Cause of fragmentation	Annualised costs	% of cost of fragmentation
Common issues	Piecemeal procurement (mainly ATM systems)	€30m - €70m	14%
	Sub-optimal scale in maintenance and in-service development (mainly CNS)	€10m - €15m	
	Fragmented planning	€60m - €120m	
ACCs	Economies of scale in ACCs (operating costs)	€370m - €460m	53%
	Economies of scale in ACCs (capital cost)	€105m - €140m	
	Constrained sector design (flight efficiency benefits)	€50m - €100m	
ATM systems	Lack of common systems (operating costs)	€150m - €215m	23%
	Lack of common systems (capital costs)	€30m - €90m	
	Increased coordination at interfaces	€10m - €20m	
CNS infrastructure	Optimum location of en-route navaids	€3m - €7m	4%
	Overprovision of secondary radar	€15m - €60m	
Associated support	Economies of scale in training, administrative costs and R&D	€40m - €100m	6%
	Total costs of fragmentation	€880m - €1400m	100%

Flight Efficiency/Environmental impact: According to the study and interviews commissioned, under the “top down” approach there will be concern that service providers will sacrifice flight efficiency to realise commercial returns. The extent to which this occurs is dependent on the quality of regulation and the structures provided for determining, monitoring and incentivising performance against this dimension. There is a body of experience of how successfully safety, efficiency, reliability and other dimensions in the transport sector can be addressed under a concession model. To the extent that flight efficiency targets are required to be met under the terms of operating licenses, improvements can be expected in this area and may be assumed to be consistent with targets established under the Performance Scheme.

Capacity/delays: As for flight efficiency/environment, there exists a concern that capacity would be sacrificed for the benefit of cost and profits. However if avoidance of delay can be made a central customer requirement, with financial penalties for failing to meet the requirement the impact could be quite positive. The difficulty lies in devising a balance of indicators that avoids any unplanned consequences.

(oo)

Administration costs: There would be a rise in administration costs for contract and project management, but considering the likely reduction in number of ANSPs this would remain minimal.

Regulatory costs: Creation of a new centralised entity will have a major impact on the regulatory costs. The new entity would have to run the day to day operation of airspace design and possibly also infrastructure planning, procurement and managing. These day to day operations are expected to have an impact on costs. However, before such a new entity is able to run the day to day operations, an additional task of completely redesigning the airspace in Europe would have to be done. Both the task of redesigning the airspace as well as the day to day operations are expected to result in a considerable additional cost, that would have to be recovered through route charges in the same manner as the Network Managers cost is recovered today. It is difficult to estimate these additional costs, but at the minimum a staff of 50-100 persons would need to be recruited, which would mean an additional cost of € 0.8-1.6 million if the average costs of employment of one person at an European NSA is used (€ 162 000 per year[176]). It should of course be noted that as this staff would replace currently existing staff in 27 Member States, the overall cost would diminish.

Social impacts: There would be very significant social impacts as staff would be made redundant and the majority of ANSPs would either cease to exist or be merged into bigger entities. This may also imply changes to working conditions and lower job quality in all categories of staff, but most of all for engineering and administrative support staff.

Safety: There should be no impact on safety as the same safety provisions would still apply as today.

Employment: Reduction in staff numbers in support, administrative and managerial positions is highly likely. On the other hand the cost efficiency improvement means lower costs for airlines, with a positive impact on employment levels in the airline industry and in the wider economy. This has been estimated at around +500 jobs in 2020 possibly increasing to +3,000 jobs in 2030.

7 ROLE OF THE NETWORK MANAGER

Option 6.1 – Do nothing

Description: In this option the Network Manager would continue to operate in its initial operating scope and the Member States would continue to be part of its governance

The advantages and disadvantages of this option have been assessed as:

Pro's

- It is early days for the Network Manager, which may need some time for current functions/processes to mature and relationship with other stakeholders to be shaped.
- Consistent with the clear majority view from the stakeholder survey.

Con's

[176] Costs for supervision in France and Germany for 2011 corrected for overheads and adjusted to EU 27 averages based on GDP per capita expressed in PPP

(oo)

- The Network Manager is not well integrated into the planning and investment decisions of ANSPs (to provide reliability of network performance planning).
- The Network Manager may need additional support to position itself as a strategic partner to ANSPs and FAB for optimum network performance.
- The initial set of functions forms only a fragment. A more consistent formulation of the functions performed would help deliver results

Risks

- When it was created, the Network manager was understood to include only an initial set of functions and from the start it was assumed that this set would be completed once SESAR is nearing delivery and the Network Manager is properly established. If this opportunity is not used, the development of SESAR may be delayed.

It could be argued that nothing as such is wrong with the Network manager. It has performed in its initial remit as planned. On the other hand this initial remit was always understood to be just that and only a warm-up in preparation of the SESAR deliverables, which require co-ordinated deployment at network level.

Option 6.2 – Move operational Governance to industry and simplify EU and State governance of strategic matters

Description: In this option a two-tier governance model would be implemented, so that the ANSP's and airspace users are prominent at operational level and Member States at strategic level.

The advantages and disadvantages of this option have been assessed as:

Pro's

- It addresses the lack of influence users are able to exert.
- Provides a better vehicle for the Network Manager to be truly in a position to manage the performance of the network. Currently there is a dependency on ANSPs and FABs for delivering network performance and an assumption that these parties have the same priorities.
- Greater user influence on decision making – users determine the cost/service trade off.
- Addresses the lack of capacity to require changes given the already existing regulatory requirement to employ "cooperative decision making".
- Expanded operational scope needs a different governance model, meeting more frequently.

Con's

- The retention of right of States to not comply is a major limitation on Network Manager effectiveness

(oo)

- The Network Manager relies on ANSPs/FABs to deliver network performance, but this option could make them feel disempowered and consequently less commitment to supporting Network Manager plans

Risks

User priorities may not align with SES or SESAR priorities. The users (who pay for the entire system) may opt for delay to achieve short term savings. Their view is generally short term compared to ANSP/FAB planning which is long term, as evidenced in past with IATA demanding ANSP make cost savings rather than increase unit rates when traffic is in decline. Due to the nature of ATM as an infrastructure industry with high fixed costs, a long term perspective is required if the industry is to be modernised.

Cost efficiency: Greater user influence should expose the Network performance to further scrutiny, and there is some evidence from the SES2+ study and the participation in the Network management budget task force that airspace user's involvement in the NM Board is directing this. Given that service provision decisions remain in the hands of ANSPs this is likely to have limited impact, particularly as States retain the right to not comply with Network Management Board decisions. This limits the Network manager capacity to drive improved cost effectiveness. Until and unless this option addresses this issue, the net benefit in terms of cost efficiency is marginal at best. Thus the cost of service, beyond the Network manager direct costs, is not something the Network Manager controls. Assumption is marginally positive benefit.

Flight/environmental efficiency: Potentially user priorities are better reflected in the Network Operations Plan and to the extent that flight efficiency is a priority compared to Network Manager costs and delays, there will be more emphasis on improvements. However the overall impact is likely to be marginal as the fundamental issue of dependence on States to comply and ANSP and national military organisations to implement remains. Assumption is marginally positive benefit.

Capacity/delays: Whilst the costs of delays are recognised as a significant economic cost, there may be different priorities held by users in the detail of how delays are dealt with and what their importance is considered to be vis-à-vis cost. There are several trade-offs that can be made here: Delays vs. cost, The importance of delays per delayed flight vs. average delay per flight, Peak rather than average delays etc. More operational governance will likely reflect better airspace user priorities. However, the impact is likely to be marginal as the solution to capacity issues requires investment by ANSP which remains beyond the capacity of the NM to control under this option. Assumption is marginally positive benefit.

Administration costs: Minor if any – this is very similar to the current model, just a change in the composition

Regulatory costs: Since the regulatory environment is largely unchanged, the costs should stay unchanged as well.

Social impacts: None.

Safety: No impact.

Employment: No impact.

(oo)

Option 6.3 – Create a joint undertaking of the industry to operate the Network Manager

Description: This option is a further development of the previous model so that the Network Manager would be run like any other ANSP, but under an industry joint undertaking model.

The advantages and disadvantages of this option have been assessed as:

Pro's

- Greater user influence on decision making – users determine the cost/service trade off.
- Network Manager maintains neutrality needed for providing the centralised services.
- A more strategic partnership between FABs and Network Manager may reduce duplications.
- May also help assist inter and intra-FAB coordination.
- The engagement of all stakeholders in coordinating the investment strategies for the Network and implementing operating concepts for the Network on a regional basis.
- The mutual dependency of the Network Manager initiative and SESAR is recognised and the role of both is enhanced to ensure achievement of the shared objectives of these key elements of SES, as defined in the European ATM Master Plan and the SES regulations.

Con's

- The State and ANSP stakeholders need to be prepared to work through the FAB structure. They may perceive this as high risk.

Risks

- User priorities may not align with SES or SESAR priorities. The users (who pay for the entire system) may opt for delay to achieve short term savings. Their view is generally short term compared to ANSP/FAB planning which is long term, as evidenced in past with IATA demanding ANSP make cost savings rather than increase unit rates when traffic is in decline. Due to the nature of ATM as an infrastructure industry with high fixed costs, a long term perspective is required if the industry is to be modernised.

This option covers the possibility of an industry joint undertaking operating the Network Manager, with political and performance steering by the Commission and Single Sky Committee and safety oversight by EASA as today. This would lead to participation by the Industry in its widest sense, including airspace users and operators, and with appropriate distance to the supplier industry to avoid conflicts of interest. It is assumed the Network Manager JU would be a similar concept as the SESAR JU. Within the new Network Manager the governance would be organised on two layers; strategic and operational

Cost efficiency: This option would give the ANSPs and users greater stake in the performance of the Network Manager thus potentially leading to improved network performance which would in turn drive reductions in the cost of services. It may also provide the potential for opening aspects of the Network Manager services and supply to greater competition thus further lowering the costs.

(oo)

The SESAR projects relevant to demand capacity balancing, which are an influential factor in cost efficiency, would have a much improved level of support under this option. However, the benefits are difficult to quantify and the reality remains that the Network Manger itself is only one player in the network so the impact could be assessed as marginally positive.

Flight/environmental efficiency: This option may see some incremental improvements in route design which will exceed the airspace improvements currently planned by the States by better reflecting airspace user priorities and creating greater separation of the political and operational dimensions in determining Network Manager priorities. However the keys will remain involvement of the military along with the increased identification of ANSPs with (and thus support for) the Network Manager function. Therefore some improved performance could be expected under this option, but any improvement is minor relative to the overall target.

Capacity/delays: As with the previous option, the impacts are likely to be marginal. The solutions to capacity issues require investment by the ANSPs, which remains beyond the Network Managers remit. Some positive effect can however be achieved through improvements in the enforcement of flow management measures and the greater focus on this and the flight efficiency target as well as improved interaction between the Network Manager, ANSPs and users could reasonably be expected to realise the 2014 delay target of 0.5 minutes per flight.

Administration costs: No impact.

Regulatory costs: Costs of administering the new JU can be assumed to double the cost currently occurred for the Network management Board structure simply on the basis that to be effective this new body needs to meet at least bi-monthly which is twice the frequency of the current board and it also needs to go deeper in managing the Network Managers work.

Social impacts: No change.

Safety: No change.

Employment: No change.

Option 6.4 – As option 6.2 or 6.3, but with a role for Eurocontrol built around the Network Manager and a more comprehensive centralised service provider and including also airspace design in broad sense

Description: This model would combine either option 6.2 or 6.3 with an enlarged scope of the Network manager, so that new centralised services stemming from SESAR would be integrated in it

The advantages and disadvantages of this option have been assessed as:

Pro's

- Subcontracted development and operation of Network Manager will function as a sweetener for the more commercially minded ANSPs. i.e. more along the lines of the current EAD service that is subcontracted to GroupEAD.
- Establishes a semi-commercial model as an option for provision of ATM support services.

(oo)

- May enable improvements in services that are currently difficult to influence such as MET provision. E.g. by making a single MET provider, States would be under considerable pressure to avoid duplicating it through their national costs.
- ANSP given direct management oversight.
- Brings commercial disciplines to provision of Network Manager services.
- Likely to reduce costs of service.
- Optimal solution for harmonisation of systems and facilitating alignment with SESAR.

Con's

- Many Member States would be likely to oppose a commercial model.

Risks

- Political risk

This option also requires a governance split as described in either Option 2 (User dominated Network Management Board) or Option 3 (Network Manager JU) as the service would be increasingly of the nature normally provided by national ANSPs. A key feature of this option is the concept of centralised services. This is a developing idea where certain database driven ANS/ATM services may be centralised with the provision of these services exercised at network level after unbundling at national level and tendering to industry through the Network manager, which would most likely own and develop the technical infrastructure required. The Eurocontrol submission to the consultation describes that "Up to ten centralised services should be established by the Organisation in the period 2013-2017". The emphasis of centralised services is to avoid potential duplication and lower the costs of achieving the SES, with particular reference to SESAR deployments.

The concept of more centralised services for the network manager is built on the success of initiatives such as the European AIS Database (EAD[177]) and, more recently, the PENS network service[178]. The objective of any centralised service must be to meet user's requirements in an efficient way, avoiding duplication of the service across the user base. Centralised services are also driven by an imperative to collaborate, and may show some or all of the following characteristics:

- require information to be shared with a high degree of trust (accuracy, integrity, confidentiality and security);
- provide services that may be complex and therefore difficult to fulfil;
- meet common needs of users without generating a 'superset' of requirements;
- provide a common view of information, typically through a single point of access;
- provide de-facto harmonisation of information and its formats and processes;
- support open source access to enable users or other suppliers to innovate value-added services (without duplicating costs to stakeholders).
- Allow for deploying SESAR concepts from a blank sheet with minimal cost.

177 www.ead.eurocontrol.int/eadcms/eadsite/index.php.html
178 www.eurocontrol.int/articles/pan-european-network-services-pens

(oo)

It would be reasonable to expect a compelling business case for a centralised service, which will not only account for cost-benefit analyses but also consider risks and benefits to service quality. The ideas and initial investigations for a centralised service are likely to arise through existing bodies, such as Eurocontrol, FABs, other ANSP Alliances and, in the future increasingly the SESAR Deployment Manager.

Part of the business case would need to be to determine the optimum organisational owner for the service, and the Network Manager is likely to be the likely candidate; as it already has the required governance, expertise (ATM and information services), legal base and technical infrastructure. This does not mean, however, that the Network Manager would automatically also be the supplier of the service, but it may take a service management role.

The service management role would include specifying the requirements, contracting the development/operation of the service, managing performance and subjecting the service to periodic market competition to ensure cost efficiency. The winning consortium's profile, contract duration and ownership of assets are important considerations to reduce risks and protect the interests of the service's clients in case of supplier change or default. Industry, including ANSPs, would be potential suppliers, but would be doing this through an established provider such as the Network Manager and be subject to market pressures.

Cost efficiency: This option is likely to reduce costs of service through the adoption of competition for supply and the application of commercial disciplines to management of the functions (assuming these are adopted under options 2 or 3 as Eurocontrol is not currently managed on this basis). Most importantly this option would lead to a major reduction of unnecessary duplication at Member State level.

The precise benefits flowing from this depend on the nature of the services provided, and Eurocontrol has made some initial estimates that the benefits could be in the region € 150-200 million over a 10 year period. If meteorological forecasting were to be included in this, the benefits could readily be up to 10 times this amount. Further benefits may be accrued from execution of completely new SESAR related services as some centralised services may be a more efficient way of achieving what is a new cost to the current determined unit rate. Overall it is likely that if well-defined and managed, these services could make a positive contribution to achieving the cost efficiency targets proposed for RP2.

Flight/environmental efficiency: This option would be expected to impact flight efficiency, particularly as centralised design of airspace is one of these functions. This option would see greater consistency in airspace design and operation which would be reflected in improved flight efficiency. A centralised approach including centralised provision of core services relating to operation of the network is the most likely means to secure the upper range of the preliminary RP2 flight efficiency targets. However, there are a number of provisos, not least of which is the extent to which the military can be engaged.

Capacity/delays: The option would have considerably higher delivery potential than the other options, as it could introduce improvements in flow management via introduction of effective 4D trajectory management. It is one of the key SESAR concepts and would maximise in particular runway capacity by introducing time-based operations from gate-to-gate.

Administration costs: No additional costs compared to do-nothing scenario.

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Regulatory costs: Costs will not change noticeably, but some effort may be shifted internally.

Social impacts: None expected in the Network Manager, but the practise of outsourcing through time-limited concessions will lead to regular changes in job content and security.

Safety: None expected.

Employment: No reduction in overall numbers is expected, but shifts from one provider to another may occur as concessions change.

8 MICRO-ECONOMIC IMPACT OF SCENARIOS

The table below sums up the way in which the choice of individual options supports each scenarios total improvements. As explained in section 6.2.1, the effect of option group 3 (ineffective role of NSAs) have been cancelled out, as they are already factored into the overall performance scheme benefits. Therefore they are presented below, but in brackets. The "+" signs indicate benefits that are most likely to contribute positively, but that are too minor, or uncertain to be assessed precisely, so they are shown only as indications of direction, strengthening the other benefits. Due to uncertainties involved with future pay-scales, actual need of personnel and various external factors, a 20% uncertainty factor has been applied to administrative costs.

Figure V-9: Comparison of policy scenarios for Scenario 2 (Risk optimised scenario)

	Cost-efficiency	Flight-efficiency	Capacity/delays	Administrative costs
Support services	+	0	0	0
(NSA independence)	<€ 75 M p.a	+	+	-€ 6.5 M p.a (saved)
User focus	++	++	++	€ 15 M p.a
Performance scheme	€ 240 M p.a.	€ 1.6 Bn p.a.	€ 120 M p.a.	0
FABs	€ 10 M p.a.	+	+	0
Network Manager	+	+	+	€ 0.16 M p.a.
Total:	**>€ 250 M p.a.**	**>€ 1.6 Bn p.a.**	**>€ 120 M p.a.**	**€ -7.9-9.7 M p.a.**

Figure V-10: Comparison of policy scenarios for Scenario 3 (Performance optimised scenario)

	Cost-efficiency	Flight-efficiency	Capacity/delays	Administrative costs
Support services	~€ 450 M p.a	0	0	€ 4.5 M p.a
(NSA independence)	~€ 150 M p.a	+	++	- € 4.5 M p.a (saved)
User focus	++	++	++	€ 15 M p.a
Performance scheme	€ 300 M p.a.	>€ 2 Bn p.a.	€ 150 M p.a.	0
FABs	€ 10 M p.a.	+	+	0
Network Manager	€ 15-20 M p.a.	++	++	€ 0.32 M p.a.
Total:	**>€ 780M p.a.**	**>€ 2 Bn p.a.**	**>€ 150 M p.a.**	**€ -13.8-16.8 M p.a.**

(oo)

9 IMPACT OF SCENARIOS ON EMPLOYMENT

As regards employment in the ANSP's, a reduction in costs will lead to fewer employed staff in the ATM industry. Based on the PRB's indicative ranges of cost reduction, the IA support study estimated that the different scenarios could lead to the magnitude and type of reductions of staff described below. It has to be noted that the figures contain numerous uncertainties as it is impossible to predict, what strategies different service providers will choose to reduce costs and also the effect of oncoming technology shift is difficult to predict before the technology has matured.

The estimate is based on the fact that a high percentage of ATM service provision costs is actually staff costs. Hence a real reduction in costs will most likely require cuts in staff costs and lead to fewer employed staff in the ATM industry. Based on the PRB's indicative ranges of cost reduction, it has been estimated how the different scenarios could lead to reductions in staff over the period 2015-2019, based on 46300 staff in 2014:

To do this, the consultants have applied the annual rate of cost decreases to the PRB scenarios to an estimate of staff numbers for the period 2015-2019:

- Staff numbers were estimated by extrapolating the trend in total staff numbers from 2010[179] to 2014. The 2010 figure for EU States was 45165 and the trend from 2007 – 2010 was a slight increase of 0.63% per year. This gave an estimate of 46300 staff in 2014.
- The rates of decrease for each scenario was as defined by the PRB's RP2 consultation[180], namely "minimum" = -0.2%, 'stretch' = -1.1%, "accelerated stretch by 2030" = -1.7% and "accelerated stretch by 2025" = -4%.
- The "accelerated stretch" scenario assumes also the iclusion of results from a full structural reform of support services as per option 1.3.
- It was also assumed that there will be more job losses at the lower end of the salary scale, driven by changes in technology. This will impact the roles of air traffic control assistants and maintenance engineers more strongly than other staff. It is therefore estimated that there may be more job-losses in this category, which is also towards the lower ends of ANSP salary scales. To account for this we have assumed that job losses could be an additional 10% higher than otherwise predicted by the cost-reduction rates of the scenarios. The resulting estimates of reductions in staff were:

Figure V-11: Job losses vis-à-vis PRBs RP2 consultation

Scenario	**Staff reduction**
Minimum	500
Stretch	2700
Accelerated stretch	4200

[179] Using the Eurocontrol PRC ACE2010 report

[180] PRB, 'EU-Wide Targets for RP2 Indicative Performance Ranges For Consultation February 2013'.

(oo)

by 2030	
Accelerated stretch by 2025	9400

Equating the PRB RP2 scenarios to the packages of options discussed in this report results in an overall estimate of:

- ‘do nothing’ = ‘minimum’ = 500
- ‘risk optimised = average of ‘stretch’ and ‘accelerated stretch by 2030’ = 3450[181]
- ‘performance optimised’ = ‘accelerated stretch by 2025 = 9400

Certain categories of staff will be affected more than others, with the impact according to ACE categories likely to be as follows:

- **"Controllers in Ops – Area Control Centres (i.e. en-route)"**. Currently these make up for 16% of total staff. According to the PRU Costs of Fragmentation study[182], new technology and operational improvements should contribute to raising controller productivity, as would moderate changes to shift hours and patterns. The challenge for ANSPs is to manage controller numbers to forecast demand, so the numbers may not decrease substantially, but may even increase with traffic growth.
- **"Controllers in Ops - Approach and Tower"**. Greater use of Aerodrome Flight Information Service (AFIS) instead of control towers and, in future, Remote Operated Towers could reduce controlelr requirements at smaller towers.
- **"Cotrollers – non-operational"**. Currently 4% of the total, it is likely that these numbers will reduce.
- **"Abinitio"**, **"Ops support – non-controller"** and **"Undertaking On-The-Job-Training"**. These trainees are currently 8% of the total and will change in proportion to any reduction or increase in the number of ATCOs.
- **"ATC Assistants"**. These positions are not needed in many current and certainly future Area Control Centres, so the current total of 2522 (4%) is likely to decrease significantly.
- **"ATS Electronics Personnel (ATSEP) – maintenance"**. Currently at 20% of total staff, with more ATSEPs than controllers. The ratio of the more efficient providers is towards 1:2 ATSEP to ATCO, although this will depend on a number of factors. With rationalisation of maintenance through initiatives such as FABs, SESAR or unbundling, these are likely to decrease.

181 Rounded off to 3400 in chapter 6 of main document due to the inaccuracies inherent in any such estimate.

182 http://www.eurocontrol.int/sites/default/files/content/documents/single-sky/pru/publications/other/fragmentation.pdf

(oo)

- **"ATSEP - planning and programme"**. At 2674 or 5% of the total, when compared to ATCO numbers these appear high, but with current modernisation programmes they may remain at this level unless more can be done collaboratively in FABs or more centrally.
- **"Admin"**. At 8740 staff or 15% of the total it is likely that these positions will be reduced, particularly with FABs enabling consolidation of support services.
- **"Support services"**. Unbundling and consequent rationalisation of ancillary services could lead to particular reductions in staff numbers.
- "**Other**". It is not possible to assess how this category might be affected, which is 6% of the total.

However, the lower costs and greater efficiency of aviation stemming from achievement of the SES targets should stimulate competiveness and increase employment in Europe. Therefore, as concluded in chapter 6, the overall impact of SES2+ should be positive as constraints to growth are removed, even if the transition phase will be painful for those affected.

(rr)

ANNEX VI

DESCRIPTION OF PERFORMANCE SCHEME AND MONITORING MECHANISMS

The performance scheme of the Single European Sky is based on Article 11 of Regulation (EC) 549/2004 as amended by Regulation (EU) 1070/2009. It is ultimately linked to the common charging scheme of Article 14 and 15 of Regulation (EC) 550/2004 as amended by Regulation (EU) 1070/2009. The performance and the charging scheme are implemented through Commission Regulation (EU) 691/2010 (the 'performance regulation') and Commission Regulation (EC) 1794/2006 as amended by Commission Regulation (EU) 1191/2010 (the 'charging regulation'), respectively. Both, the performance regulation and the charging regulation are currently revised.

According to the performance regulation, national supervisory authorities (NSAs) have to draw up performance plans covering all key performance areas (safety, environment, capacity, cost-efficiency) and for the duration of so-called reference periods. Member States adopt these performance plans together with national performance targets that should be consistent with and adequately contributing to the Union-wide targets. Targets are expressed on the basis of selected key performance indicators.

Following examination comitology procedure, the Commission decides within 15 month before the start of the reference period on performance targets at Union-level for all key performance areas. These targets are then broken down on local level.

For the first three-year long reference period 2012-2014, Member States only had to set local targets for capacity and cost-efficiency. The environment target expressed as horizontal flight efficiency was supposed to be achieved at network level. For the first reference period there was no target setting on safety.

The second reference period will be of five years duration (2015-2019) and will result in the setting of Union-wide targets in all four key performance areas. Controversial n the revision of the performance and charging regulation was the question on how to address cost-efficiency target setting for terminal air navigation services due to the heterogeneous nature of service provision.

The Performance Review Body (PRB) assists the Commission in the implementation of the performance scheme. Eurocontrol, acting through its Performance Review Commission (PRC) and supported by the Performance Review Unit (PRU) is designated as the PRB until 30 June 2015.

The PRB is consulting and proposing target ranges and targets in all four key performance areas. Based on the PRB input the Commission is then proposing targets to the Single Sky Committee of Member State representatives that then have to agree the proposed targets. For the first reference period, the PRB initially proposed a minus 4.5% yearly reduction of charges in the area of cost-efficiency. This initial target was then watered down to an annual minus 3.2% following the discussion in the Single Sky Committee. A similar process may be expected to take place during 2013 when targets need to be fixed for the second reference period 2015-2019.

On the basis of agreed Union-wide targets, Member States have six month to adopt performance plans and targets and to submit them to the Commission. The same period applies to the elaboration of the Network Manager performance plan and target. As of the second reference period, performance plans and targets have to be elaborated at functional airspace block level.

The Commission, supported by the PRB, is then assessing the performance plans. For reference period 1, the Commission found that initial performance plans did not allow concluding that the targets included in these plans are consistent with and adequately contributing to the Union-wide targets. As a consequence, the Commission adopted a Recommendation to Member States to revise performance targets contained in performance plans.

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The subsequent revision of performance plans showed some improvement, however, not at a level expected by the Commission. In addition, some Member States contributed significantly more to achieving the Union-wide targets then others. The PRB assessed the revised performance plans and recommended to the Commission to adopt those revised performance plans. The PRB argument was that considerable improvement was achieved, that the revised traffic forecasts mean that the capacity targets will be reached and that the anticipated loss due to traffic risk sharing is larger than the remaining gap to the Union-wide target.

The Commission accepted this reasoning mainly due to its past experience that further improvements would be very likely blocked in the Single Sky Committee. Another argument was that the first reference period was only of three years duration and that a long fight with Member States would create uncertainty almost until the middle of the first reference period. Theoretically, the Commission could have gone one step further and could have decided following comitology examination procedure to ask Member States for corrective measures.

Following the adoption of performance plans and targets, the Commission has developed a Commission Recommendation on monitoring and reporting in order to facilitate and to harmonise monitoring and reporting on the achievement of performance targets.

If targets are not met, the Commission can intervene and ask Member States for corrective action. However, the tools for enforcement of corrective action are rather weak. Until today, no experience has been gained as to the feasibility to implement changes in case targets are not met.