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COMMISSION STAFF WORKING DOCUMENT

accompanying the

Proposal for a

REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

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

IMPACT ASSESSMENT

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COMMISSION STAFF WORKING DOCUMENT

Proposal for revision of the Single European Sky legislation

IMPACT ASSESSMENT

Executive summary:

The impact assessment on the revision of the Single European Sky (SES) legislation[1] (2008/TREN/030) follows the recommendations of two major preparatory reports: the High Level Group report on the future regulatory framework for aviation (July 2007) and the Performance Review Commission report on the 'Evaluation of the impact of the Single European Sky initiative on ATM[2] performance' (December 2006). The SES proposals will form an integral part of a wider package, with two other elements: (1) the extension of EASA competences to air traffic management (ATM) and air navigation services (ANS) (2) the endorsement of the SESAR[3] master plan. Because of their specific nature, the SESAR and EASA proposals will be the subject of separate appraisals.

The proposals considered for SES II do not introduce new legislation as such, but rather **consolidate** the previous SES package (SES I) and **add** an overall performance-driving framework. This framework will strengthen the network approach and introduce environmental performance as a new area.

What is the problem?

Our current air traffic management (ATM) system is operating **close to its limits** and there is scope for improvement. There are inefficiencies in cost and capacity and ATM does not restrict the environmental impact of aviation. The system is still **fragmented** along national borders, lacks good network coordination and efficient use of airspace. These problems lead to total additional costs of over €3bn per year.

Sub-optimal routing (**flight inefficiency**) not only translates into loss of time and money, but also to unnecessary fuel burn and emissions. At the same time, traffic is

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[1]   Regulation (EC) No 549/2004 of the European Parliament and of the Council laying down the framework for the creation of the Single European Sky,
Regulation (EC) No 550/2004 of the European Parliament and of the Council on the provision of air navigation services in the Single European Sky,
Regulation (EC) No 551/2004 of the European Parliament and of the Council on the organisation and use of airspace in the Single European Sky,
Regulation (EC) No 552/2004 of the European Parliament and of the Council on the interoperability of the European Air Traffic Management Network.

[2]   For a list of all abbreviations used in the text, see **Annex 1**.

[3]   SESAR is the Single European Sky ATM Research project, which aims to modernise the ATM system both technologically and operationally. For more information see http://ec.europa.eu/transport/air_portal/sesame/index_en.htm and http://www.sesar-consortium.aero/.

expected to double or, in some regions, even triple by 2020, to a volume that current technology and organisation will struggle to handle safely. Increased congestion in turn leads to unmet demand, reduced competitiveness and unrealised economic potential both for aircraft operators and the economy at large.

What are the main causes of the problem?

1. **Lack of a network approach:** air routes were historically designed as a function of national air carrier needs or to reflect the network of traditional radionavigation aids. While navigation technology and the needs of airspace users have changed significantly, the route network does not reflect these changes. As routes channel fee-paying traffic through predetermined territories, hence determining the income of service providers, the national approach has led to cross-country flight efficiency being a secondary concern in route network design. The situation is further complicated by sub-optimal civil-military cooperation.

2. **Insufficient oversight of natural monopolies:** air traffic management is mostly a natural monopoly (one service provider in each block of airspace due to technical constraints and sunk investment costs), which prevents efficiencies through competition. This system and the corresponding full-cost recovery mechanism do not incentivise service providers to improve their services to customers (i.e. airspace users). Instead, it contributes to a 'live and let live' attitude.

3. **Governance**: while the Single Sky legislation brought air traffic management under the Community umbrella, essential obligations were left to national discretion. Some elements of the system also remain the responsibility of intergovernmental structures with limited enforcement powers. The current institutional arrangements for ATM are not in line with industry developments (corporatisation, privatisation, etc.) and require a clear separation of policy- and law-making from oversight functions and service provision.

What are the main policy objectives?

The over-arching objective of the revision of the Single Sky legislation is to ensure that the ATM system effectively provides the infrastructure for the aviation industry and other users so that the Lisbon objectives can be fulfilled. Performance must focus on four key areas — cost-efficiency, flight efficiency, capacity/delays and safety. Environmental protection will be added in the revised package as an explicit objective, as a key area for service provision and a criterion for route network design.

What are the main tools for achieving the policy objectives?

The proposals aim to drive the performance of the ATM system. A **regulatory** framework with target setting will gradually ensure this. The **network approach** will be enhanced to solve local problems with system-wide effects. Wherever possible, the **unbundling** of services should be considered with a view to introducing competition. This performance framework should ensure more efficient integration of service provision within functional airspace blocks (FABs).

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1. PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES

1.1. Organisation and timing

This impact assessment has been performed by DG Energy and Transport (TREN) with contributions from an Inter-Services Steering Group in which the following Directorates-General participated: the Secretariat General, the Legal Service, COMP, SANCO, TRADE, EMPL, ENTR, ENV, BUDG, INFSO, RTD and ECFIN.

The revision of the legislation could draw upon two influential reports. Firstly, the Performance Review Commission (PRC) adopted in December 2006 its 'Evaluation of the Impact of the Single European Sky initiative on Air Traffic Management Performance'[4], providing a thorough analysis of the implementation of the Single European Sky over the previous three years. Secondly, the High Level Group on the Future Aviation Regulatory Framework delivered its report to Vice-President Jacques Barrot (July 2007): 'A framework for driving performance improvement'[5].

The two reports were produced separately, but both called for a revision of the current Single Sky legislation. Based on these inputs, the Commission adopted in December 2007 its 'First Report on the implementation of the Single Sky Legislation: achievements and the way forward'[6]. Immediately afterwards, and thus before the drafting of the proposal itself, work was started on the impact assessment to explore options for revising the SES[7].

In order to meet the goal of a total system approach, recommended by the High Level Group, the revision of SES I will be developed and coordinated together with the proposal for an Airport Capacity Action Plan, the proposal to extend EASA competences to aerodromes, air traffic management and air navigation services and the proposal on the ATM Master Plan, which are all due to be put forward mid-2008.

1.2. Consultation and expertise

The preparation of this proposal has been preceded by the publication of the two reports mentioned above, one of a more technical nature, the other more politically oriented, and intense consultation of the aviation industry.

Technical expertise

This impact assessment relies on several sources of expertise, but mostly on the various reports published by the Eurocontrol Performance Review Commission (PRC). The PRC is independent and provides highly respected reports. It produces not only annual

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[4]   See report on
       http://www.eurocontrol.int/prc/gallery/content/public/Docs/PRC_Evaluation_of_SES.pdf.
[5]   See details of composition and report on:
       http://ec.europa.eu/transport/air_portal/hlg/index_en.htm.
[6]   COM(2007) 845.
[7]   CLWP ref.: 2008/TREN/030.

reports but also specific reports on issues such as the cost of fragmentation or comparisons between the EU and US systems, some at the request of the Commission.

The PRC report analyses the impact of the Single Sky legislation from a performance standpoint, taking into account user needs. The report concludes that the Single Sky has already had a positive impact, especially in (i) increasing collaboration between service providers and (ii) ensuring separation between national service provision and oversight. However, while Community legislation provides the basis for better air traffic management, it does not drive the industry towards more tangible improvements: the most promising tools for improving performance have remained the responsibility of the Member States. For this reason, the PRC considers the development of quantitative **performance criteria** necessary for further progress. To this end, it proposes 31 concrete measures to be implemented in the short or medium term[8].

Political expertise

In September 2006, Vice-President Barrot called upon a High Level Group[9] to examine the way forward. In July 2007, the Group submitted a unanimous report containing ten recommendations[10]. The report concentrated on performance and governance in order to strengthen the capabilities of the main actors. The Community regulatory framework should give more responsibility to industry to deliver the required environmental, safety, cost-efficiency and capacity benefits.

Consultation of stakeholders

Besides the two major contributions mentioned above, to ensure a full assessment, additional consultation of stakeholders has been organised at all levels:

1.   **A high-level** consultation forum was held on 22 January 2008 with an audience of over 400 people. Vice-President Barrot attended the meeting. There was broad agreement among stakeholders on the need to rapidly change the Single Sky legislation now in order to drive the performance of the air traffic management system, using the 'Community method' as the sole vehicle for change. Performance should be considered in a broad sense, including safety, capacity, cost-efficiency and above all the environment[11]. The idea of a network design and management function also received widespread support.

2.   Use of the three **formal** consultation channels: (1) Member States and their military representatives on the Single Sky Committee, (2) industry stakeholders in the Industry Consultation Body, established by the Framework Regulation, and (3) social partners in the Air Traffic Management Working Group established in the framework of the Sectoral Dialogue Committee on Aviation.

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8   Evaluation of the impact of the SES Initiative on ATM Performance, Eurocontrol PRC, December 2006.
9   See details of composition and report on
        http://ec.europa.eu/transport/air_portal/hlg/index_en.htm.
10   The 10 recommendations are given at the end of **Annex 2**.
11   Conclusions of the conference are given in **Annex 3**.

3.	**Informal consultations** were also organised. Beyond bilateral meetings, more structured meetings — at European association level — were organised directly with the airline community, general aviation (GA), air navigation service providers, trade unions (both in the air traffic management industry and at Eurocontrol), airports, the military community and aviation equipment suppliers. These meetings served as a first acid test for more concrete ideas and the possible options for legislative proposals.

Consultation of Commission services

The inter-service steering group met on 18 and 25 January 2008 to assess the draft impact assessment report. Practically all comments and observations were incorporated into the text.

## 1.3.	Results of external consultation rounds

As stakeholders were continuously involved in the reflection on the revision, most associations and formal consultation bodies were able to adopt formal positions, culminating in a series of presentations. These discussions demonstrated that the aviation community expects significant and, especially, operationally robust proposals for change. **All stakeholders endorse** the need to introduce a performance framework[12].

Broadly speaking, all Member States, including the military representatives, support the direction for action suggested in the Commission communication on the 'First report on the implementation of Single Sky and the way forward'. Military airspace users expressed the view that the Community should engage with the Ministries of Defence to promote collaboration in line with the Statement of Member States on military issues related to the Single European Sky, attached to the Framework Regulation. In addition, they agree that sovereignty should no longer be seen as an obstacle to reorganisation of the ATM network and that pragmatic solutions should be found within a civil-military partnership.

Industry is also supportive of change. There are differences, however, regarding timeframe and scope. Among **airspace users**, the airlines insist on the rapid introduction of strong performance regulation at Community level, while **air navigation service providers** point to better regulation, subsidiarity and respect for local particularities. **General aviation** (GA) supports the use of the Community method, as long as they are effectively consulted and the Community sets principles that are then implemented locally to ensure flexible access to airspace and services on fair terms. **Staff** representatives too endorse the idea of performance, stressing that safety must remain the overriding principle and that workers' organisations must be closely involved in the process of change.

Consultations have shown widespread support for the planned measures to improve **network management**. After some initial concerns on the part of the military that it

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[12]	Stakeholders are represented on the Industry Consultation Body, which has been working intensively during the consultation period (from December 2007 onwards). This has resulted in substantive position papers. Note that **Annex 4** lists all the consultations held.

would affect their segregated areas were addressed, all parties now support the creation of a route network design body. Concerning the management of scarce resources, expectations are very high — sometimes even unexpectedly high — that the coordination measures will effectively alleviate the shortages. Overall, the changes in network management are seen not so much as a revolutionary new measure but rather as the logical enhancement of already existing, or planned, initiatives.

Stakeholders did not agree on the way forward on the measures for **opening to the market.** In general, this concept was perceived as a managerial **tool** likely to help in reaching performance targets rather than as an end in itself. While some stakeholders, especially airspace users, were favourable to the idea, in general it was felt that the use of unbundling should be left to the discretion of Member States and ANSPs rather than be imposed at EU level. Unbundling may impact on contingency and continuity of service, and hence is closely linked to core business. Some stakeholders stated that the issue should be dealt with during discussions on integrating services into functional airspace blocks. Staff representatives were against any form of opening. Even on meteorological services and training services, stakeholders could not reach a unanimous position.

Discussions on **functional airspace blocks** generated no clear feedback as this issue had taken a back seat in relation to the performance framework and the concept of economic regulation. However, there was a feeling that a top-down approach would not be welcomed, especially from the military side.

To conclude, the **minimum standards for consultations** were met and stakeholders were given the chance to actively contribute to the consultation process.

1.4.   Opinion of the Impact Assessment Board

The report was submitted to the Impact Assessment Board in early March. Following the opinion issued by the Board on 11 March, the following improvements were made to the report:

- Clarification of the problem definition:

    – Institutional issues with Eurocontrol are clarified in 2.2.2.1, last paragraph, together with an explanation in Annex 6;

    – The impact of the lack of competition for certain unbundled services is described in chapter 4;

    – The role of functional airspace blocks is clarified in the assessment in chapter 4;

    – The link with SESAR is specified in chapter 2.5;

- The comparison of options was facilitated by bringing together the description and analysis;

- The environmental performance of ATM is expressed per flight — as with improved airframes and engines; the overall level of emissions is the object of ETS;

- The outcome of consultations is further detailed, especially on the introduction of market measures;

2. PROBLEM DEFINITION

Aviation is a global industry contributing to employment, social cohesion and growth. Air traffic management[13] provides, together with airports, the **infrastructure** for air transport. Although the current EU air traffic management system is in general functioning well for current needs, it is operating **close to its limits** and there is much scope for improvement in performance. Europe's ATM infrastructure is facing a doubling or even, in some regions, tripling of traffic by 2020[14], which will inevitably lead to a capacity ceiling and increased delays and may compromise safety. Air traffic management should not become a bottleneck for aviation growth.

Air traffic management is a **network** industry: the performance of the system depends on its weakest link. A technical hiccup at one airport causes a ripple effect throughout the whole system, leading to significant (**external**) costs for operators, the travelling public and the economy as a whole. Consequently, the external costs of a failing system may **exceed** the costs charged to air space users.

This means that our system is confronted with fundamental **problems**. Firstly, despite the good **safety** record, many Member States and service providers need to improve safety levels in view of increasing traffic. The route network has to deal with flight **inefficiencies** to improve the environmental capacity of aviation. There is also the challenge of meeting **capacity** requirements to avoid costly delays. Last but not least, air traffic management needs to become more **cost-efficient**.

2.1. The European air traffic management system is working at sub-optimal level

The International Civil Aviation Organisation (ICAO) has developed a **global vision** for aviation. Air traffic management should perform better. ICAO has therefore come up with eleven areas for improving performance. Four are of particular importance for Europe: safety, capacity/delays, cost-efficiency and flight efficiency. Flight efficiency in particular is attracting attention as it is intrinsically linked to environmental performance. The performance of the European ATM system can be **analysed and measured against targets[15]**.

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[13] Under the ICAO definition, Air Navigation Services are: Air Traffic Management, Communication, Navigation and Surveillance, Aeronautical Information Services, MET, and Search and Rescue. ATM encompasses Air Traffic Services, Air Traffic Flow Management, and Air Space Management.
[14] PRC Reports.
[15] The report uses as a reference the reports of the Performance Review Commission of Eurocontrol.

2.1.1. Safety

Safety is the overriding objective of the whole aviation system. Although Europe has a good safety record, safety procedures vary widely among the Member States. This means that accurate and consistent risk measurement across Europe is lacking. Incident reporting, which is mandatory under Community law[16], is progressing and provides clarity on some risk areas, but progress is slow and uneven across Member States. These variable trends make it difficult to reach conclusions on safety trends at European level. Without robust and transparent reporting and adequate information, it is not possible to undertake a performance review. The system also suffers from a lack of best practices in safety management[17]

Some Member States (i.e. national supervisory authorities introduced to oversee safety under the first SES package) and air navigation service providers would need to enhance their capability to implement all the SES safety requirements and specific safety enhancements. Without a proper European framework this undermines the confidence that every air navigation service provider has been certified properly by the local NSA and that the SES regulations are implemented so as to guarantee minimum safety standards[18].

All in all, despite the good safety record, there is a need to improve safety management, as increasing traffic leads to an **exponential increase** in risk. As yet, there are no commonly accepted **safety performance indicators** at European level to drive improvements in the overall safety performance of air navigation service provision.

2.1.2. Flight efficiency

Airspace is a **scarce resource**, which must be used in an optimal way to satisfy the requirements of both civil and military airspace users. An optimal flight would allow an aircraft to take off steeply to reach its ideal flight level (some 10 – 13 km high with less gravity and resistance) as fast as possible, to take the shortest great circle route, and then to continuously descend to approach its end destination.

Flight efficiency measures the difference between the actual and optimum aircraft trajectories. On average, aircraft fly **49km per flight longer** than strictly necessary, or about 6% of an average 850km route. This flight inefficiency is costly in terms of lost time and money, but also leads to **unnecessary fuel burn** and consequently greenhouse gas emissions. If flight efficiency could be improved by 2km between 2006 and 2010, aviation could save up to €1 080m[19].

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[16]   Directive 2003/42/EC of 13 June 2003 on occurrence reporting in civil aviation; and
        Commission Regulation 2096/2005 of 20 December 2005 laying down the common requirements for the provision of air navigation services.

[17]   Evaluation of the impact of the SES Initiative on ATM Performance, Eurocontrol PRC, December 2006.

[18]   Idem and SES Factual Review and Reporting project, 2006.

[19]   Performance Review Commission, 2007, An Assessment of Air Traffic Management in Europe during the calendar year 2006, Eurocontrol, Brussels.

2.1.3. Capacity/delays

Air traffic management should not become a **bottleneck** for the development of the aviation industry and should be able to cope with demand by providing sufficient capacity. After the crisis provoked by the Yugoslavian war, triggering enormous air traffic delays in the '90s, delays have improved, especially after the 9/11 traffic downturn.

Recently, this improved trend has begun to reverse, as the Eurocontrol 'notional' target of one minute delay was not met for second consecutive year[20]. The main reason is the insufficient provision of **capacity** and inadequate commitment to the timely and complete implementation of capacity plans.

Delays carry a **heavy cost** for operators, the flying public and the economy as a whole: 9.2 million minutes of delay translate into a cost of €710m (sub-optimal allocation of aircraft and crew and time lost for passengers). Bigger delays have particularly disruptive effects: the two percent of cancelled flights account for 2/3 of total delays. In general, the system is very susceptible to any form of disruption, where the performance of the network as a whole depends on the performance of its weakest link.

2.1.4. Cost-efficiency

The market for air navigation services amounts to €**7.8bn**, or about 4% of the aviation market. The largest part, some €6.155bn, is for en-route services, the rest for terminal air traffic control. In comparison, air traffic control in the US is nearly **twice as efficient**: it handles nearly two times more traffic for about the same cost as in Europe. Further, the annual cost-inefficiencies of the European system are estimated at €2bn (PRR 2005, Chapter 9), which represents around 20% of the total costs.

The principles for the financing of air traffic control are based on **ICAO rules**, established in 1944, when state administrations still were in charge of provision. The charging rules allow full cost recovery from users. This system does not provide any incentive to improve cost-efficiency and explains the strong backing of the civil aviation industry for regulation. The Single Sky has translated these principles into Community law, while **allowing Member States to use incentives** to improve cost-efficiency. **None has done so since 2004[21]**.

A system of de facto self-regulation has yielded a **patchwork** of results across countries (-45% to +32% over the last four years). Generally, costs have **continued to grow** steadily over the last five years (27.8% for the Eurocontrol 38-country area). The notional target of a 3% reduction per serviced flight has not been attained[22]. The achievement of a -3% cost efficiency target between 2003 and 2008 would have saved €2.6 billion. If extended to 2020, this target, even if met, would not allow the **SESAR target** of halving ANS costs to be achieved by that year.

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[20]   Idem.
[21]   UK has a price cap system and operates ATC in airports on a market basis. Germany has recently introduced competition in ATC at some regional airports.
[22]   Overview of unit rates over the last 10 years in Annex 5.

2.2. Causes of the persisting problems

The SES I legislation has introduced powerful tools to improve performance through: designation of service providers; unbundling of services; use of economic incentives; setting of user charges; changes in route structure; establishment of FABs; rationalisation of infrastructure[23]; etc. However, **the use of these tools was left to the discretion of Member States**. Member States have hardly used these tools. Moreover, a fully performing system can only be achieved if the amalgamation of national systems is transformed into a **genuine network**.

2.2.1. Lack of a genuine European network approach (legal, institutional, technical fragmentation)

2.2.1.1. A fragmented system on the ground **...**

Other segments of aviation have been organised within the single market, but air traffic management has remained **heavily fragmented**, organised within national borders. For the sake of clarity, fragmentation in ATM can be defined as the division of service provision into smaller decision-making units than would result from considering the optimum scale[24].

Graph 1: Fragmentation of Air Navigation Service Provision
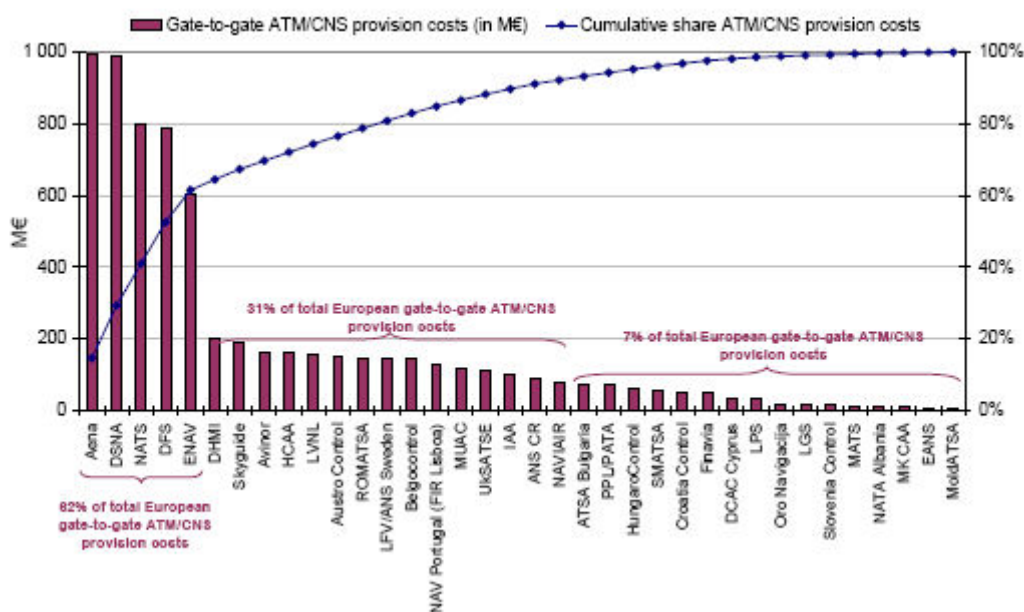
Source: Performance Review Commission Eurocontrol

This system is the result of historical decisions taken within the constraints of **national boundaries, resulting in the sub-optimal scale of operations**. This leads to

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[23] PRC, 2006, *Evaluation of the impact of the SES initiative on air traffic management performance*, Brussels, p. iii.

[24] The impact of fragmentation in European ATM/CNS, Report commissioned by the Eurocontrol PRC, prepared by Helios Economics and Policy Services, April 2006.

fragmentation in airspace, in service provision, in systems and in regulations, which brings significant additional overhead costs for airspace users and end-consumers.

Fragmentation prevents the air traffic management industry from developing economies of scale, leading to the **sub-optimal size** of en-route centres and unnecessary **duplication** of systems between and within countries[25], with the associated support and maintenance costs.

Table 1: Annual Cost of Fragmentation in Air Navigation Service Provision

	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	
	Unsynchronised technological change	Counted elsewhere	
ACCs	Economies of scale in ACCs operating costs	€370m - €460m	53%
	Economies of scale in ACCs capital costs	€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	Requirements for VHF radio	Not significant	4%
	Optimum location of en-route navaids	€3m - €7m	
	Overprovision of secondary radar	€15m - €60m	
	Inconsistent use of primary radar	Not included	
Associated support	Economies of scale in training, administrative costs and R&D	€40m - €100m	6%
	Total costs of fragmentation	€880m - €1400m	100%

Source: PRC, 2006, the Impact of Fragmentation in European ATM/CNS, p. 55

The comparison here is against a theoretical ideal with a reduced number of centres and a common system.

Despite technological progress in aviation in general, air traffic control (ATC) remains primarily **craftsmanship**. While cockpits have become automated, ATC systems have not evolved and controller working methods are fundamentally unchanged. The **productivity** of air traffic controllers (the number of flight-hours controlled for each hour spent by an ATCO on operational duty) **is low in Europe**: on average, an air traffic controller monitors less than 1 aircraft at any given time[26].

The increase in traffic is met mainly by opening new 'sectors' with a **proportional increase** in staffing and hence cost. As this approach is reaching its limits, it will lead to

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[25] Some Member States have integrated military and civil service provision, which reduces costs and allows for a genuinely flexible use of airspace.

[26] The ratio of the number of controller hours divided by the number of flight hours controlled is 0.7 — PRC reports.

a capacity wall in the coming 5 to 10 years without the necessary technological innovation.

2.2.1.2.   … leads to fragmentation in the air

The main reason for horizontal[27] flight inefficiency is the **lack of an optimised strategic** design and use of airspace from a **trans-European network** perspective: routes may be direct within national airspace, but this does not imply the shortest distance between departure and destination. The current European route network is still an **amalgamation** of the national routes that served the (then) national flag carrier or followed conventional terrestrial radionavigation aid facilities. Therefore, the route network is not always well aligned with current cross-border traffic flows. The shortest available routes are underused due to the lack of precise real-time information.

The Performance Review Commission points out that 63% of route inefficiencies can be resolved **within country** boundaries and the other third at country interfaces, which demonstrates the European dimension of flight efficiency. At present, air navigation service providers are not penalised if they do not offer the optimal available route and airlines are not penalised if they do not take the optimal route but use longer routes to avoid costly areas.

Graph 2: Flight inefficiencies

A patchwork of national networks

In order to ensure the safety and orderliness of traffic and to avoid areas reserved for military training, aircraft do not fly straight but are required to use a historically grown patchwork of routes. In this way, they miss out on one of the major advantages of air traffic: the ability to travel 'as the crow flies'.

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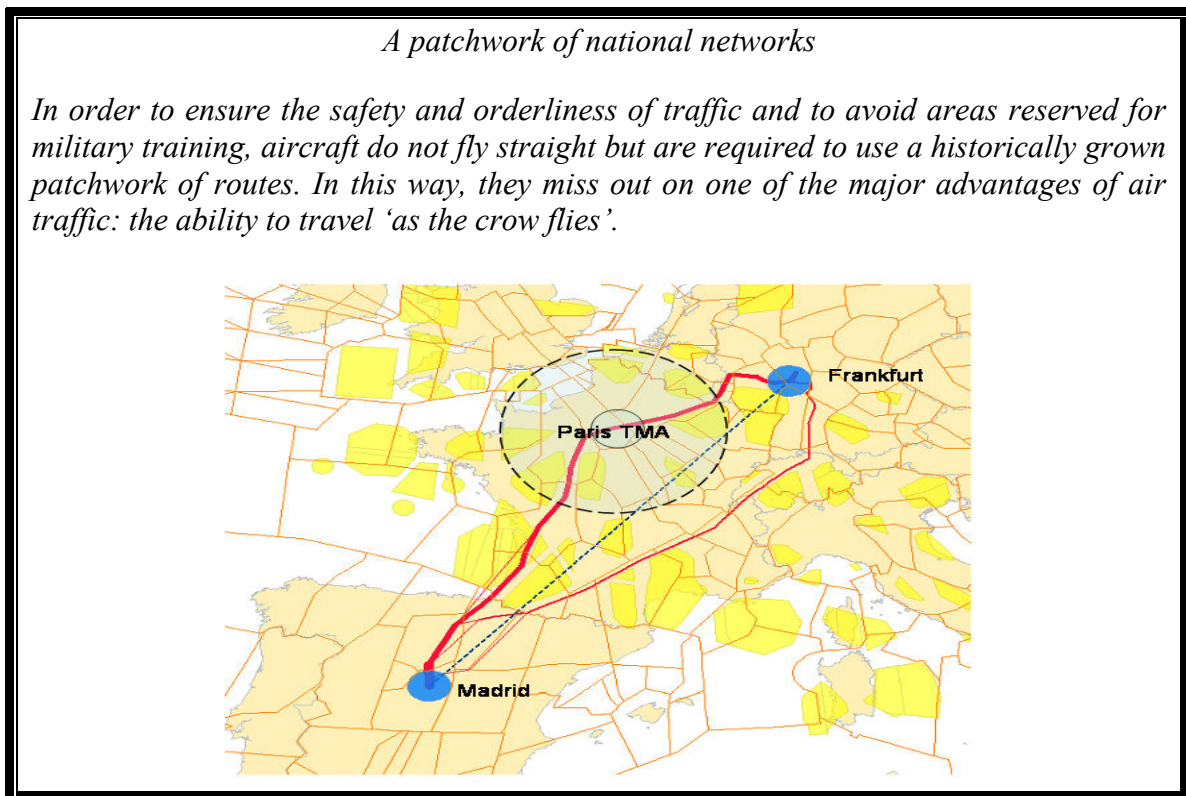
[27]   Vertical inefficiency is a limited issue at European level — 23 kg more fuel consumption per flight, or 0.6%, while horizontal inefficiency results in 5.9% more.

Member States are hesitant to tackle airspace fragmentation. Routes (and hence traffic) determine **income flows** for air navigation service providers and hence directly impact on **employment**[28]. Another source of reluctance is the **military**, which have their own exercise areas along routes.

Currently, the route network is managed on an **intergovernmental basis** within Eurocontrol, where Members States, with the help of their air navigation service providers, come together to discuss improvements to the network[29]. This model brings together stakeholders that would not normally agree to coordinate their air navigation service providers or networks. However, there are **no incentives** to change, and the voluntary nature of the process is also its greatest drawback in that exactly those parties that most need to improve are always able to stop short of actually implementing the agreed improvements.

Another issue is the need to enforce Member State implementation of appropriate routes and sectors to optimise airspace use, especially at weekends where there is no military activity. Currently, there are no performance indicators to monitor progress in the **effective use of airspace by civil and military users**.

2.2.1.3. … and insufficient network management capacities and coordination of management of scarce resources

Linked to fragmentation is the failure to establish robust **network management** functions. As noted above, routes are determined in a national context and not with the **interest of the network** in mind. Similarly, national considerations in the distribution of some scarce resources — for example radio frequencies — cause inefficiencies, as every actor has to keep a pool of reserve frequencies for itself, due to the lack of a system of coordination to ensure more efficient allocation of frequencies. This in turn causes the scarce resources to run out prematurely and leads to unnecessary installation of new technologies, when better use of existing resources could avoid those costs[30]. Hence, the network management initiative seeks to answer not only the problems of flight inefficiency and the environment, but also that **of unnecessary cost**.

In general, flight efficiency depends not only on the use of airspace, but also on other scarce resources. Many technologies are also limited in how many 'customers' they can serve, which limits capacity growth in the ATM system and causes additional costs by requiring the installation of alternative technologies. A good example of these

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[28]   Aircraft operators are charged on the basis of the distance flown through national airspace (multiplied by a factor for weight) according to the last filed flight plan.

[29]   Eurocontrol Route Network Design Sub-Group.

[30]   For example, the urgency of implementing equipage with 8.33 KHz radios in aircraft is mainly due to poor coordination of frequency allocation in Europe. Despite having twice the European traffic, the US does not see a need for this investment — which in Europe carries a cost of some €600-800 million — because as a single administration it has been able to establish efficient frequency usage and coordination. Community spectrum policy supports efficient use of frequency bands, which has so far not been attained in aviation. A similar situation exists for example for transponder codes.

constraints is radio frequencies[31]. The VHF frequency band currently allocated to aviation is 118 to 136 MHz (allowing 720 channels, with 25 KHz spacing).

Traffic growth requires more and more channels, since each new air traffic control sector needs its own channel to ensure **interference-free communications**. However, the installation of new technology (for example to reduce channel spacing and thus create new channels within the assigned band) is very costly due to the large number of radio stations to be equipped. To re-equip all the 120 000 to 150 000 stations with new radios, for example, the cost would be in the order of €600-750 million[32]. This underlines the need to strive for **optimal use of these scarce resources** through coordination and optimal allocation to permit capacity growth and cost-efficiency.

2.2.1.4. … and unnecessary fuel burn and environmental impact

A direct consequence of flight inefficiencies and sub-optimal management of scarce resources is the **problem of unnecessary fuel burn** in aviation. Aviation currently contributes around 3% of all CO_2 emissions in Europe. Air traffic management could play a considerable role in limiting emissions — **some 7-12%** of emissions are influenced by ATM measures[33]. Improving horizontal flight efficiency could save nearly **5 million tonnes** of CO_2 per annum. This could offset, at least for a while, the emissions from a growing aviation industry.[34] Environmental impact should be a consideration in route design. Noise is another issue, especially in terminal areas, where noise restrictions may sometimes affect environmental performance.

A quote from a recent PRC report:[35] '*In the European core area, 32% of the airspace volume above FL195 is shared between civil traffic and military activities. On average… the shared airspace is assigned 74% of the time to civil traffic and 26% to military operations. In the European core area, although shared airspace is fully available for civil traffic one third of the year (i.e. weekends), airspace utilisation by civil traffic does not improve significantly compared to weekdays. During weekdays, in the European core area, the airspace booked by military is actually not used half of the time (13% of the daytime period on a yearly basis).*'

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[31] Current technologies that are quickly becoming scarce include radio frequencies and (radar) transponder codes, but as traffic grows, more and more technologies are likely to approach their capacity limits and their optimal use has to be addressed.

[32] The calculation is based on the conservative assumption of only one radio on average for each aircraft or ground station and an average price of €5 000 per radio installation. Many aircraft have more than one radio and the cost of radio installation varies widely depending on radio and aircraft type, so exact estimates are difficult.

[33] Performance Review Commission, 2007, An Assessment of Air Traffic Management in Europe during the calendar year 2006, Eurocontrol.

[34] ATM, like research on engines and airframes, deals only with environmental performance **per flight**. Total emissions as such are not addressed.

[35] Evaluation of civil/military airspace utilisation, 15 November 2007, PRC.

2.2.2   Poor governance of a natural monopoly

2.2.2.1   National monopolies under self-regulation

One of the most prominent features of this sector is that air traffic services[36] are provided by **natural monopolies** not subject to competition. Physical and technological constraints make it impossible for two air traffic control organisations to compete for control in the same airspace. Competition **for** the market is also difficult due to high sunk costs.

In a number of Member States, air navigation service providers have been **corporatised**[37] with a view to increasing the quality of services. The problem is that **regulatory structures** have not been adapted to cope with these natural monopolies[38].

Strong **oversight** depends on separation from service provision to avoid conflicts of interest. In some Member States, oversight authorities are still in a learning phase and understaffed. Some authorities need support and cooperation to effectively implement SES obligations.

Continuing with the traditional principle of **full cost recovery**[39] has not given sufficient incentives to service providers in Europe to control costs and make productivity gains. Indeed, the US system — which is run as a state administration — manages to handle twice the traffic at a similar cost.

Few countries have developed a proper economic regulatory framework together with proper oversight of investment plans and spending of the air navigation service provider in order to introduce incentives to cut costs or improve services. In any case, no matter how effective a separate national economic oversight structure is, it cannot overcome the deficiencies affecting the entire network. **Benchmarking** through performance review under the Eurocontrol inter-governance structure has kept self-regulation and has not led to satisfactory results.

Weak governance explains why SES I has not delivered the expected results in some important areas. In general, the **functional airspace blocks** approach[40] is not producing the benefits hoped for in terms of improved flight efficiency, cost reduction and defragmentation. Early indications from ongoing initiatives are that tangible results in terms of cost reductions and capacity increases are modest at this stage.

One — but not the only — reason for this is that most projects have been launched by air navigation service providers without **sufficient support** from Member States[41]. It

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36   ATC is a service provided for: preventing collisions between aircraft; preventing collisions on manoeuvring areas between aircraft and obstructions on the ground; and expediting and maintaining the orderly flow of traffic.

37   Removed from government and turned into state-owned corporations. Only the UK NATS is a public-private partnership. For details on shareholding see www.nats.co.uk.

38   ICAO Doc. ANSConf-WP/26(2000).

39   ICAO principles allow for the full recovery of costs for air navigation service provision. Member States have scrupulously applied this principle to recover costs from airspace users.

40   Regulation 551, Article 5.

41   'Evaluation of FAB initiatives and their contribution to performance improvement', 2008, PRC study, ordered by the European Commission.

has also become clear that the division between upper and lower airspace set at flight level 285 (28 500 feet) is **artificial** and only contributes to unnecessary fragmentation, thus running counter to the SES objectives. In fact, even though not legally required, all ongoing FAB projects currently cover all the airspace.

While it is recognised that the creation of FABs is a new challenge and faces significant technical and organisational difficulties, **sovereignty**, particularly the Member States' responsibilities and associated liability for their airspace and the involvement of the military, remains an issue. Instead of prompting innovative mechanisms to exercise sovereignty, it often is used as an **argument** against enhanced cross-border cooperation and integration.

Following successful certification, each air navigation service provider is entitled to offer its services in other EU countries. However, no Member State has taken up this opportunity to **designate a** foreign provider. Some Member States have even raised the issue that the designation of foreign providers is prohibited under their national law. Nor have Member States used the possibility to **unbundle** some services to improve their quality.

Governance is an acute and widely recognised problem within Eurocontrol. Over the years, Member States have had a clear separation between regulation, oversight, service provision and financing. In Eurocontrol, these functions have all been concentrated within an intergovernmental structure. **Regulation** is flawed by the requirement to obtain consensus for decision-making. Moreover, the implementation of rules depends on the good-will of Member States. **Oversight** is not organised for all non-regulatory activities, and responsibility for both oversight and service provision remains within the same organisation. Aircraft operators, who **finance** the ATM system through charges, and air navigation service providers that have been corporatised at national level have difficulty influencing decisions on operational issues within an **intergovernmental** organisation where final decisions are taken by Member States, which may no longer be responsible for directly providing air transport or air navigation services.

2.2.2.2 Sovereignty and the military

Changes to the ATM system have always proved difficult because of the association of airspace management with sovereignty and defence. Member States are sensitive to the introduction of rules for the design and use of airspace. As signatories to the Chicago Convention, they see airspace management as a means to comply with their obligations. An **intergovernmental approach**, however, cannot ensure the flexible and effective use of a common resource — airspace — for all users. Although ICAO offers a global regulatory framework, Member States are inclined to deviate from these standards due to 'national particularities'.

The country reports for the ICAO Universal Safety Oversight Audit Programme indicate large differences in the compliance of Member States with ICAO standards and recommended practices (SARPS). They also point to worrying issues with **safety oversight capability**. Especially striking is the fact that Member States are to be found in both the most compliant and the least compliant third of countries audited, which shows that the intergovernmental approach **maintains regulatory fragmentation**.

Similarly, the ongoing study by the European Commission, ICAO and Eurocontrol on the official differences from ICAO SARPS reported by Member States has so far revealed 1 522 differences (situation as at 20 February 2008). These are all cases where Member States have implemented their own **national rules or procedures** in place of the commonly agreed ICAO rules.

Both studies indicate a worrying tendency for Member States to accept non-uniformity and disregard for ICAO rules. The negative impact on safety is obvious, as ICAO rules have been put in place mainly to ensure that international air traffic can operate in the knowledge that safety rules are implemented and applied in a harmonious manner in all countries. This may lead pilots to misunderstand local procedures or controller instructions and cause a safety hazard. This form of regulatory fragmentation is **incompatible with a single aviation market** and is irrelevant to defence interests.

Military airspace users demand a fair share of access to airspace. However, building an effective civil/military relationship on ATM issues through the 'second pillar' of the EU (the Common Foreign and Security Policy) is not always easy. Variations in the organisation of civil/military cooperation in the EU stand in the way of **uniform and timely airspace management** and the implementation of changes. Moreover, the military has no mechanism for establishing a common European view, as this is impeded by different alignments of states — NATO or not, neutral or not. Where agreements are in place, they have been concluded between a limited number of states.

2.3. Who is affected, in what ways, and to what extent?

Air traffic control provides its services and guarantees safe flights outside the awareness of the flying public. Only when there is the least **disruption,** such as delays, incidents caused by bad weather or accidents does air traffic control become visible, underlining the critical need for safe and efficient air traffic control practices.

A better performing air traffic control network will benefit the whole economy.

- The **flying public**, particularly professional travellers, will benefit most in terms of safety and time. The increased reliability and resilience of the system should reduce external costs.
- **Member States** should adopt a network approach to offer aviation the best infrastructure to ensure that it prospers.
- **Oversight authorities** need to ensure a standard oversight capability in view of the integration of service provision.
- **Defence**: the military is involved as airspace user, oversight authority, service provider and regulator. It is of the utmost importance to ensure that security needs are catered for.
- **Airlines** finance the air traffic control system and should be guaranteed performance standards. As the air traffic control system evolves, **pilots** will benefit from better navigation tools and better surveillance.

- **General Aviation**[42] will be able to rely on better performing air traffic control.
- **Air navigation service providers** will become subject to performance regulation. This may lead to restructuring and require **staff** involvement.
- The efficiency of **airports** impacts on the performance of the network. Predictability requires all stakeholders to collaborate. Airports will have to integrate information on their operations to ensure an efficient gate-to-gate system.
- **The equipment** industry must ensure the swift introduction of new technologies.

2.4.   How will the problem evolve, all things being equal? Should the EU act?

While **major achievements** can be observed since the adoption of the legislative package in 2004, there is a pressing need to adjust the legislation to **overcome current limitations**, adapt to technical change and take account of new challenges.

First of all, the external analysis demonstrates that Member States have not fully used important tools for improving efficiency. This leads to variation in performance, whereby the performance of the network as a whole depends on the performance of its weakest link.

4.   The level of ambition for the regional integration of service providers into FABs differs widely: while some initiatives are promising, others can be considered as window-dressing;

5.   No Member State has used the possibility to unbundle services and open them up to markets;

6.   Only one Member State uses an economic incentive scheme[43];

7.   The route and sector design mandate remains blocked.

These instruments need to be used in a coordinated manner in order to tackle the problems of fragmentation and flight inefficiency.

Secondly, while the first legislative package was mainly driven by the dramatic increases in delays after the Kosovo crisis, the legislation does not take due account of **new challenges** such as the environment.

Thirdly, the current organisation of the ATM system is in general not able to cope with the future growth of traffic. There is a need to speed up the **pace of innovation**, coordinate the introduction of new technologies and ensure their continuous updating. **SESAR** is intended to bring about this technological leap towards a better performing system. This requires financial control and the use of incentives to orchestrate technological progress.

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[42]   General aviation covers all flights other than military and scheduled airline flights, both private and commercial. General aviation flights range from gliders and powered parachutes to large, non-scheduled cargo jet flights.

[43]   UK NATS see: www.nats.co.uk ; www.caa.co.uk.

Consultations and studies have revealed wide recognition of the **need for change** and the threat posed by the current incapacity to the longer-term position of air navigation service providers and their employees (social sustainability): if the problems are not tackled early, there is a danger of a crisis leading to sudden and uncoordinated re-organisation.

In conclusion, there is overall agreement that it is time for the Community to act with a view to improving the performance of the ATC industry and to prepare for future challenges, so as to ensure that aviation plays its role in contributing to the Lisbon objectives.

3.   OBJECTIVES OF THE PROPOSALS

The High Level Group on the future European regulatory framework advised the Commission to focus on **performance**. The over-arching general objective of the revision of the Single Sky legislation is to ensure that the ATM system will provide the **infrastructure** for the aviation industry and other users so that the Lisbon objectives can be met. This will be done by strengthening the network approach. Community intervention is possible on the basis of **Article 80(2)** of the Treaty establishing the European Community.

The table below depicts the hierarchy of objectives.

General Objective	
ATM to provide the infrastructure for the aviation industry and other users to meet the Lisbon objectives	
Specific objectives	
Improved performance of ATM; Target ATM to enhance safety, capacity and cost-efficiency; Introduce the notion of the environmental performance of aviation; Transform the amalgamation of national systems into a seamless, gate-to-gate network for the benefit of aviation.	**Consistent governance** of service provision within the regulatory performance framework.
Operational objectives	
• Introduce a framework for setting **binding objectives** for air navigation service providers at Community level, including performance review and follow-up; • Strengthen network functions; • Make use of the market where possible; • Support initiatives to integrate service provision.	• Proper balance between the Community method and local discretion; • Establish the basis for the independence of national supervisory authorities.

4. POLICY OPTIONS

The performance proposals build upon SES I, **consolidate and develop it** by strengthening instruments, and provide a framework adapted to particular ATM characteristics. As the first pillar of the proposals, a system of **performance regulation** is to be introduced. Based on the strong tradition of benchmarking against quantified targets by the Performance Review Commission, options will be analysed for transforming this self-regulatory system with voluntary targets into a genuine regulatory system capable of driving the performance of the network. Network-wide objectives will provide the basis for a process to translate these objectives into local targets. The Charging Regulation[44] can be used as a tool to provide economic incentives. As the second pillar, to supplement performance regulation, the necessary **regulatory tools** need to be put in place **to strengthen network management functions**. Scarce resources are best managed from a network perspective. Thirdly, beyond regulation, **competition** should be considered for areas where a process of consolidation could yield better quality for lower price than performance regulation. Finally, as the fourth pillar, initiatives to integrate service provision within **functional airspace blocks** should be supported as a tool to reach the performance targets.

In order to facilitate understanding of the impact of the different options, the descriptions of the options are given together with the analyses of their impact.

4.1. First pillar: Performance regulation for monopoly services

Performance regulation needs to put in place (i) mechanisms to set Community-wide principles and objectives for safety, the environment, capacity and cost-efficiency and (ii) the processes for translating these objectives into local binding targets for each ANSP.

Three options are studied: the status quo (Option 1), local target setting (Option 2), where decisions on targets are taken at national level, and Community target setting, where decisions are taken at European level. This last option has two variants (Options 3a and 3b).

4.1.1. Option 1: Status quo – continue with current SES legislation

The first SES package already contains a number of tools for improving efficiency:

- The legal barriers to cross-border cooperation have been removed with system-wide recognition of certificates for ANS providers and Community air traffic controller licensing. Further, Member States are legally obliged to reconfigure their upper airspace into functional airspace blocks[45], which are supposed to bring about defragmentation and rationalisation of infrastructure.

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[44] Commission Regulation 1796/2006 of 6 December 2006 on laying down a common charging scheme for air navigation services.

[45] Article 2 of the Framework Regulation defines 'functional airspace block' as an airspace block based on operational requirements, reflecting the need to ensure more integrated management of airspace regardless of existing national boundaries.

- The legislation allows the unbundling of services and the use of economic incentives (including economic regulation regimes for ANSPs and unbundling), but leaves this to the discretion of the Member States. Member States can also use designation procedures to impose performance levels.

Option 1 'Do-nothing' / Status quo

Benefits achieved/ problem addressed	Impact:	Explanation of rating and aspects of the policy option most relevant for the benefits
1. Economic impact / Likelihood of reaching targets	- -	Self-regulation does not give sufficient incentive for change and obtaining economies of scale, so has a limited effect in terms of performance improvement. The effect is also unpredictable, uncoordinated and dependent on the willingness of Member States and ANSPs to reach these targets.
		The variation in performance across the network brings overall performance down to that of the weakest link.
		Excessive charges result in higher prices and lower mobility for end-customers, the weakened competitiveness of European airlines, and a reduced ability to invest in SESAR programmes.
		Improvements in parts of the network may be offset by growing inefficiencies in some ANSPs.
		Responsibility for network management and airspace regulation is diluted between ANSPs, Member States and Eurocontrol. The resulting non-optimal route network has a high negative economic and environmental impact.
2. Social impact	-	ANSPs continue managing restructuring following their own rhythm.
		Governance structures are blurred: responsibilities for network management and airspace regulation are currently diluted between ANSPs, Member States and Eurocontrol, resulting in insufficient capacity in several areas.
		The social impact is borne by airlines, which are adversely affected by constraints on growth and excessive costs, and by the EU at large because of delays incurred by passengers, poor job creation in the air transport sector and low induced job creation in the economy at large.
		Moreover, if the European ATM situation does not improve, this will have a negative impact on overall European mobility and therefore on the internal market and social cohesion.
3 Environmental impact	- -	The SES I Package does not address environmental issues.
		The sub-optimal design and management of airspace leads to a non-optimal route network with a high negative environmental impact.

4.1.2.   Option 2: Local target setting (LTS)

An independent **Performance Review Body** (PRB) proposes non-binding European-wide objectives on the basis of information it collects and analyses. The Community objectives are translated into **local targets** by the national supervisory authorities (NSAs). After consultation of ANSPs and users, the pricing of services and the performance targets are **approved by the NSAs** and communicated to the Commission.

Option 2 'Local Target setting'

Benefits achieved/ problem addressed	Impact:	Explanation of rating and aspects of the policy option most relevant for the benefits
1. Economic impact / Likelihood of reaching targets	+	Improvements will remain slow and vary from Member State to Member State. Convergence will not be guaranteed (patchwork of variable national performance levels). This option risks adding to fragmentation: good performers already carry out cost-containment exercises and already perform well. Bad performers will feel hardly any pressure to contain their costs and converge towards the good performers. The costs of the fragmentation of service provision and sub-optimal route networks will continue to be borne by airspace users, passengers, and ultimately by the EU at large (see estimates above).
2. Social impact	=	Limited social impact for ANSPs, as they will remain masters of their cost containment efforts. The restructuring of ANSPs will be slow and will have a limited impact on their employees. This scenario will bring about only limited improvement in the social domain. Airspace users and the EU at large will continue to bear all the social costs of the shortcomings of the system, which are well above the social benefits enjoyed by ANSP employees. Governance: the chances for the success of this option will be greater if NSAs can be appropriately sized and protected from political influence through independence from state administrations. However, this will generate substantial additional costs.
3 Environmental impact	-	The issue will only be tackled at national level. The European aspect of flight efficiency and the corresponding environmental impact risks being ignored. The environmental situation risks worsening as the gap between good and bad performers widens, thus prompting airlines to fly longer routes to avoid costly airspaces.

4.1.3. Option 3a: European target setting (ETS)

Performance regulation for ANS provision is carried out at Community level. This option is inspired by the regulatory process used for the Emissions Trading Scheme. The **Commission approves** the performance targets on the basis of **proposals by national authorities**, after verifying that the proposed contribution to the overall performance objectives is sufficiently ambitious and realistic. The Commission's takes an individual decision for each Member State (or, in future, for each FAB) communicating its final and binding performance targets.

This option is based on a combination of local initiative and Community decision-making, ensuring that the overall, system-wide performance targets are complied with and that the targets set are binding and enforced.

5.1.3   Option 3.a European Target Setting (ETS)

Benefits achieved/ problem addressed	Impact:	Explanation of rating and aspects of the policy option most relevant for the benefits

1. Economic impact / Likelihood of reaching targets	+++	The option can be implemented without any additional structure (NSAs will need to be strengthened but the additional costs will be marginal). Coherent and substantial improvements in operational and economic efficiency can be enforced. This will bring certainty regarding savings on route charges, flight time and fuel burn for airspace users and their passengers. Moreover, it will provide more certainty that SESAR objectives will be met. Furthermore, airlines will be able to use these savings to invest in SESAR programmes, thus generating even faster improvements in capacity, reduced delays, flight efficiency (environment) and safety.
2. Social impact	+++	Improved service provision and economic efficiency will enable the sustainable growth of air traffic and thus contribute to the quantity and quality of jobs at all levels (ANSPs, airlines, industry, EU). The restructuring of ANSPs will be more effective than in the 'local target setting' option. The cost reductions imposed through targets set at EU level may necessitate restructuring in their business organisation, such as the integration of service provision. Personnel will be able to benefit from the Community license and exercise mobility. Governance: this option can be implemented without any additional structure (NSAs will need to be strengthened but the additional costs will be marginal). Social efforts by the ANSPs will be more than offset by the increased potential for job creation among airspace users and the induced effects on the economy at large.
3 Environmental impact	+++	The combination of local initiative (making use of local knowledge and respecting national sovereignty and military requirements) and Community decision-making is expected to bring positive and substantial improvements in flight efficiency and therefore in the environment. Clear responsibilities for target setting, network management and airspace regulation will ensure that environmental performance targets are met.

4.1.4.   Option 3b: European Regulator (ETS)

Performance regulation for ANS provision is fully entrusted to a Community agency: this '**SES Performance Agency'** carries out independent performance reviews of the local/regional ANSPs and, after extensive consultation of stakeholders, issues proposals for European-wide performance objectives as well as specific performance targets for all 27 ANSPs. The Commission adopts the final binding individual targets and transmits them to the national authorities for implementation.

Option 3.b 'European Regulator'

Benefits achieved/ problem addressed	Impact:	Explanation of rating and aspects of the policy option most relevant for the benefits
1. Economic impact / Likelihood of reaching targets	++✓	The most **radical** approach, bringing results immediately after implementation. However, this option necessitates the creation of a European agency, with the following drawbacks: The <u>time needed</u> to establish an SES Performance Agency, plus the time needed to allow it to perform its task of setting binding individual performance targets, is considerable and may be some

		6 years.
		Administrative costs: by far the most costly policy option in terms of administrative budget. The agency will require a staff of at least 50 and an annual budget of more than €5 million per year.
2. Social impact	--	Because of the lack of local initiative, the social impact will be radical and likely to trigger resistance from controllers in particular. Governance: would require the establishment of a new agency.
3 Environmental impact	+++	The most effective scenario in terms of environmental efficiency, as Member States will be left with no room for manoeuvre. Flight efficiency improvements will be driven by a top-down approach. However, the weak point of this scenario is that it does not in itself take into account the military/sovereignty aspects of route design. This risks generating resistance from national and military authorities.

4.2. Second pillar: Network approach for a European-level network and the management of scarce resources:

Network management

Network management comprises a wide range of network management tasks. These tasks form a set of flexible coordination and planning functions to look after the interest of the whole European network. The different network management tasks, which together form the 'Network Manager', can be handled by different actors, but together consist of at least the following:

- Route network design

- Management of scarce resources

- Traffic flow management and slot coordination & allocation

- Management of network technologies resulting from SESAR ('System Wide Information Management', satellite-based datalinks, etc.)

- Coordination of technologies & their procurement

Some of these functions need to be detailed through implementing rules, and it is important for SES II to provide for these in order to prepare for SESAR implementation.

In line with proper application of **subsidiarity**, the design of sectors — unlike routes — is best left to the service providers, as it goes deep into local arrangements, such as staff rostering and qualifications. Airspace design in the wider sense of allocating different airspace classes or segregated (military) areas to different parts of airspace is also best left to national or FAB level, given state sovereignty in this area and military concerns. The only European-level rules envisaged here are general principles stating that airspace design is performed at local level taking into account traffic demands and complexity and including consultation of all airspace users.

Route network design function

Route network design is used below **as the 'model'** case for all these network functions, since it is representative. The other functions could be organised in a similar fashion, or simplified for the coordination of scarce resources, which involves purely distributional tasks.

As the problem largely revolves around the **lack of coordination** and an **overall system level** strategy, all the options considered involve introducing better and more concentrated coordination functions. Decentralising network management to local or FAB level would only aggravate the current difficulties, which are due to the fragmented use of airspace and other resources.

Experience shows that the efficient use of a network requires an independent 'network design function', in which all Member States participate. This will propose a route network that combines local, regional and European network needs in a way that takes into account not only the needs of all three groups of airspace users and the ANSPs but also the efficiency of the **wider transport network** (intermodality). The aim is primarily to create the shortest possible routes between different city pairs and provide the airspace needed by non-commercial airspace users to operate, while also taking into account other justifiable concerns. The implementation of the network should then be overseen and its efficiency monitored regularly by the Performance Review Body.

Three main options can be identified for route network design, and are developed below. All aim for the gradual adaptation and optimisation of the route network:

Option 1 — Status quo

The current system can be described as a loose, 'soft' form of coordination at European level, which is easy for Member States to accept and comparable to the local target setting (LTS) option described for performance regulation (see 4.1 above). While Member States are fully responsible for their route networks, the majority have agreed to meet together in the Eurocontrol Route Network Development Sub-Group (RNDSG). This group does not make decisions on routes, but acts as a **forum for states**, ANSPs and some airline representatives to discuss issues. Its resolutions or conclusions are therefore in no way binding on the Member States. In this option, while coordination work is important, decisions are taken at local level.

Option 1 — Status Quo

Benefits achieved/ problem addressed	Impact:	Explanation of rating and aspects of the policy option most relevant for the benefits
1. Economic impact	--	Major improvements to the current situation are unlikely. Under the SES I rules, the Community is allowed to develop implementing rules for route and sector design principles. However, decisions on routes are simply too complex to be the subject of anything but a case-by-case assessment. Therefore, the current model, using the Eurocontrol RNDSG Group, has largely come to the end of its development possibilities, risking a

Benefits achieved/ problem addressed	Impact:	Explanation of rating and aspects of the policy option most relevant for the benefits
		considerable economic and environmental cost.
		As air traffic is expected to double or even triple in the next 20-30 years, this cost will not rise proportionally, but increase all the more due to congestion exacerbating the network choke points.
2. Social impact	-	This option will not have any immediate social impact, but compared to the ideal situation (with an optimised network) it has a **social cost**. If the network were better designed it would allow air transport to develop without the previously mentioned annual €2bn charge and thus create more secondary services and jobs. Airlines would be able to expand their operations or alternatively compete with slightly lower prices. Additionally, they would benefit from being able to make better use of their fleets due to shorter routes, hence freeing aircraft for additional operations. All this has the potential to create jobs among airspace users, which is not the case in the first option.
3 Environmental impact	--	The current situation already causes CO_2 emissions of around 5 million tonnes per year. Increasing traffic and congestion would make this much worse, since delays and congestion often mean having to hold aircraft at airports or in the air with their engines running, and flying at sub-optimal altitudes, which increases fuel consumption and emissions.

Option 2 — Central network design & management function augmented by national and European consultation mechanisms

This second option is based on Community decision-making, but the initiative is shared between the local/FAB level and European level. It calls for an independent network design body to be set up to arbitrate between the overall efficiency of the network and local constraints and specificities, such as military interests. The local levels makes their best route design proposals (having first consulted local airspace users and ANSPs) and the network design body ensures the coherence of these local proposals and their compatibility with the overall performance targets. After in-depth consideration and European-level consultation of stakeholders, the network design body finalises its draft and submits it for Commission consideration. The Commission takes its final decision on the European route network plan after having obtained the positive opinion of the Single Sky Committee (using qualified majority voting). The Commission also ensures that adequate appeal and review procedures are in place to preserve Member State sovereignty and overriding national interests.

Option 2 — Central network design & management function augmented by national and European consultation mechanisms

Benefits achieved/ problem addressed	Impact:	Explanation of rating and aspects of the policy option most relevant for the benefits
1. Economic impact	++	This option will probably be very efficient purely from the network viewpoint, even if some compromises are necessary after consultation of Member States and stakeholders. It will not only ensure an optimised network and corresponding savings, but also considerable commitment on the part of Member States and stakeholders. There are also potential

		economic gains for the airlines, which will be able to cut their costs and utilise their aircraft more efficiently, thereby opening up new routes and increasing revenue. This potential is impossible to quantify exactly, since it depends on the current route network of each airline, its product portfolio, and the general economic cycle and the demand for seats or freight capacity. Since Member States and national service providers would be involved in the work, the personnel savings would be minor, but the political acceptability of decisions will be hugely enhanced. The ANSPs would have some concerns about losing traffic due to route changes, but much less so than in option 3, as their concerns would be properly heard and taken into account under the appeal and review procedures. The economic impact would thus be roughly comparable with option 3, depending on the effectiveness of the consultation mechanism, which may even be better than with a single central designer by being more efficient in conveying local or regional constraints to the design body.
2. Social impact	+	Compared to option 3, the model has a significant positive social impact. Some changes in the work performed by staff and some — real or perceived — loss of sovereignty would result in this option as well, but the gains should be enough to outweigh the negative side-effects. The majority of staff at national level would continue to be needed for the collection of data and stakeholder views, while the central network design function would need to obtain sufficient expertise. The positive effects of improving the efficiency of the air transport network will give the industry a similar 'a license to grow' as in option 3 and thus have a positive impact on jobs and employment.
3 Environmental impact	++	As with the other options, the potential for environmental improvement is considerable. It is difficult to evaluate exactly how much in the way of emissions will be avoided, but the potential is more than the proportional increase in traffic since congestion effects then also come into play. If many compromises are necessary following consultations, the positive impact might be lessened or at least different in character (for example less noise in exchange for more emissions) but will still be practically equal to option 3. Here too, the end result naturally depends on whether the route network improvements also lead to increased flight activity.

Option 3 — Central network designer and implementer of changes

The third option would be to create a strong Community network agency, independent of all other actors. It will have sufficient expertise to design the network by itself and be institutionally separate from Member States, ANSPs and airspace users. Following stakeholder consultation by the Agency, the finalised network plan will be implemented by a Commission decision binding on all Member States. This will guarantee that the network design plan focuses only on creating the shortest possible routes between different city pairs and providing the airspace needed by non-commercial airspace users to operate. In this scenario, the initiative is fully at Community level, with Member States only consulted in the preparatory phase.

Option 3 — Central network designer and implementer of changes

Benefits achieved/ problem addressed	Impact:	Explanation of rating and aspects of the policy option most relevant for the benefits
1. Economic impact	++	This option would be the most efficient from a purely network viewpoint. It would ensure an optimised network and corresponding savings. Since the Member States and national service providers would be largely uninvolved in the work, they could reduce staff and make additional savings, therefore giving rise to a potential reduction of slightly more than the €2bn noted above. Like in option 2, this potential would emerge over a period of several years as the design process improves and each problem area is tackled in turn. The design can never be considered to be fully complete, due to changing demand patterns on the part of airspace users. On the other hand, centralised decision-making would reduce the political acceptability of decisions for Member States and especially for those ANSPs that will lose traffic.
2. Social impact	+	While economically efficient, this model would have an undeniable social and political impact. It would take away from Member States an activity traditionally considered to be their sovereign area and make a group of people redundant in both the Member State administrations and their service providers. Some 20 people design the whole US en-route network — which has a comparable area and twice the traffic — while in Europe 27 Member States and ANSPs each have their own offices performing this task. More importantly for the efficiency of the network, this option would also create considerable concern as to how the interests of local airspace users and service providers are to be taken into account. However, some of this negative impact could be offset by the possible increase in activity and jobs among airspace users.
3 Environmental impact	++	As in Option 1, the potential for environmental improvement is considerable. It is impossible to evaluate exactly how much in the way of emissions will be avoided in practice, since some of the gain could be negated by the increase in activity, but the potential is more than the proportional increase in traffic since congestion effects then come into play as well.

4.3. Third pillar: Introduction of market measures for unbundled services

4.3.1. Description

The provision of air navigation services (ANS) is generally considered, given the current technological possibilities, as a **natural monopoly**. Accordingly, improving the performance of the system requires performance regulation.

However, some of the services currently provided by vertically integrated service providers could be provided under market conditions after '**unbundling**'. In most discussions, the provision of communication, navigation and surveillance (CNS) services, aeronautical information services, meteorological services, tower services at

aerodromes, and (parts of) training are seen as candidates for the introduction of competition.

Table 2: Air navigation services market (2006 figures — in '000 €)

1	Air traffic management		5 054	65%
		En-route	4 014	52%
		Terminal	1 056	14%
2	Meteorological		389	5%
3	Search & Rescue		23	0.3%
4	Aeronautical information		156	2%
5	CNS		1 322	17%
		Communication	544	7%
		Navigation	311	4%
		Surveillance	467	6%
6	Supervision		78	1%
7	Eurocontrol Agency		622	8%
8	Other		156	2%

The current legislation allows for unbundling at Member State level. However, Member States are quite hesitant to consider this tool for increasing performance. In some Member States, air traffic services at aerodromes are provided under competitive conditions (competition **for** the market). Initial training for air traffic controllers is another domain where some Member States have introduced market forces.

This chapter looks at these services with a view to assessing the possibilities for introducing competition.

Communication, navigation, surveillance services (CNS)

CNS services provide the 'eyes and ears' for air traffic controllers and pilots and are **critical** services for air traffic control. Accounting for 17% of total ANS costs, they are a substantial cost component, which is reflected in the relative share of employment: nearly 30% of ATM staff are technical support staff, ranging from a maximum of 54% to a minimum of 10%. This reveals quite **patchy** performance in CNS provision, and competition in the market could be considered as a means to improve performance.

Air traffic control in towers ('Tower services')

Some Member States have experience with competition for this €1bn market, while others are **considering** market opening. Market opening is considered from two angles: the choice of airports for airlines and the effective range of competitors for providing air traffic control.

Meteorological services (MET)

Member States have established meteorological services for the protection of their citizens. MET services are considered to be of **general interest** and cover a variety of tasks and functions with a multitude of user groups, both the general public and vital industries such as energy, agriculture, transport, media, military and transport.

In recent years, the introduction of new technologies with satellite observation, high-powered computing facilities and new communication technologies has **transformed** meteorology from a labour-intensive industry with many observational tasks to a high-tech sector with the potential for centralising operations and reducing costs.

ICAO has defined MET as an air navigation service, so it can be **charged** to the civil aviation industry at the discretion of individual countries. Some Member States may decide not to recover any costs, while others have decided to establish a meteorological provider exclusively for aviation (and hence recover 100% of costs).

In some Member States, the MET costs recovered from aviation appear **disproportionate** compared to what other industries pay. On average, civil aviation MET costs represent some 25% of total national MET costs, with shares ranging between 10% and 50%. In addition to the discretionary charging of costs, there appears to be **scope for improving** the relationship between aeronautical users and the aeronautical MET providers.

Aeronautical information services (AIS)

To ensure flight safety, aeronautical information provides the pilot with **basic** information on the state of airports, runways, signalling, availability of routes, military exercises, etc. AIS provision is naturally much more limited in scope compared to MET, but a similar technological evolution is taking place. Paper information is being replaced with modern electronic forms that can be downloaded.

Under the ICAO rules (dating from 1944), AIS are provided 'under **State responsibility'**. Countries are free to provide the service themselves or use any method they wish to choose a service provider, but ultimate responsibility and liability lie always with the country whose airspace it is. Since — understandably — no country is eager to take responsibility for more than one provider they have always designated only one provider for these services.

ICAO also defines a set of 'standard services' describing the datasets and formats to be provided. These standard services are under revision, as **modern technology** is resulting in more and more services being considered minimum public services. It is even estimated that the current ICAO-type AIS services will triple in terms of content, but technological development still leaves ample room for additional value-added services to be provided outside the ICAO framework.

Training for air traffic management personnel

Air traffic control remains a **craft**. Safety lies in the hands of controllers who require the ability to visualise a three/four-dimensional picture of flights from a two-dimensional radar screen, to take quick decisions and to communicate these in an authoritative way to pilots. This craftsmanship is the result of rigorous selection and intensive training.

Training for air traffic controllers is regulated on the basis of the Directive establishing the 'Community air traffic controller licence'[46]. **Initial training** is traditionally given in

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[46]   Directive 2006/23/EC of 27.04.2006 (OJ L114/22).

academies, linked to the service provider, where students receive theoretical courses and simulation training. The skills and competences can only be acquired on the job under supervision through a period of work in an air traffic control unit. This unit training cannot be separated from air traffic control and hence is not eligible for unbundling.

Conclusions: two options

The first option would be to **continue with the current legislation**, i.e. leaving the discretion for unbundling to Member States. The second option would be to have decisions taken at **Community** level and introduce open tendering procedures for the provision of these services.

4.3.2. *Option 1: 'Continue with current legislation (market measures decided at national level)'*

While some Member States have taken the decision to organise tendering procedures for ATC at airports, none has decided to unbundle. Under the current legislation, most Member States **are expected to retain the vertical integration** of service provision (services would be subject to **performance** regulation).

Option 1 — Continue with current legislation

Benefits achieved/ problem addressed	Impact:	Explanation of rating and aspects of the policy option most relevant for the benefits
1. Economic impact	+/-	As air navigation service providers would continue to be designated, they would be sheltered from competition, but would be subject to **regulation**. This regulation could lead to the adoption of performance indicators for specific services and hence improve performance in a planned way. Where no specific performance indicators are defined, improvement will be slow and marginal. It will be a challenge for the **regulator** to set the appropriate performance level. Vertical integration implies that service providers continue to operate in the national context, unless the integration of service provision into functional airspace blocks leads to some form of **consolidation** of these services. The pace of innovation could be slow due to small economies of scale and lack of market incentives to change. It is important to master the changes in critical services like CNS, as the smallest hiccup in the system could lead to significant external costs. Leaving discretion to national level would in most cases imply leaving decisions to management which can best assess the associated business risks. As restructuring may be slow, the flying public might have to pay too high a price for these services. This opportunity cost must be weighed against the possible **increased risks** of incidents leading to delays, and hence lost time. This assessment has to be made by type of service eligible for unbundling. The risk of **external costs** may be high in the case of CNS, but quite low in the case of meteorological or training services. Indeed, a technical defect in a major airport or service provider may cause disruptive effects throughout the whole network, costing millions of euros.
2. Social impact	-/+	Preserving vertical integration would **protect** existing jobs in an industry sheltered from competition. This could lead to poor allocation of human resources in the overall labour market. The incentive to **restructure** is

		quite weak and **cross-border** service provision is hampered.
		If air traffic management fails to meet demand, growth in aviation as such is jeopardised, hence leading to a **bottleneck** in the creation of jobs in the much wider aviation sector (37 000 in ATM versus 380 000 in aviation).
		To the extent that the slow pace of innovation delays the introduction of better performing technologies, the **safety** of the flying public could be impacted.
3 Environmental impact	-	The slow pace of innovation could negatively impact the environment, as the introduction of modern equipment allowing for more precise navigation and hence '**greener flights'** could be delayed. However, the concerted introduction of equipment could also be regulated.

4.3.3.   Option 2: 'Market measures for unbundled services'

The other option is to have the decision to unbundle taken at Community level and open the unbundled services for public tendering.

Benefits achieved/ problem addressed	Impact:	Explanation of rating and aspects of the policy option most relevant for the benefits
1. Economic impact	+	The unbundling of services could boost **competitiveness**, especially in cases where these services carry a disproportionate weight in the overall cost. The patchy performance of CNS and MET in particular suggests that there is much scope for improvement. For meteorological services, which are in most Member States provided by organisations separate from air navigation service providers, this may require more transparent funding, possibly through the public purse.
		In addition, market pressures would lead to a healthy **consolidation**, e.g. in the training market, where some academies organise training courses for very limited numbers of students. Centralised MET services could also be provided for several Member States.
		Unbundling would create opportunities for **cross-industry** cooperation. For instance, CNS could be provided by non-ATM providers; air traffic controller training could be organised together with pilot training or in conjunction with universities. Service provision could be more focused on the needs of the market instead of the needs of the individual service provider, which may be more influenced by 'short-term' management decisions.
		Market players would also have an incentive to capture the market through the introduction of new **technologies**, as seen in telecoms. For CNS, MET and AIS services in particular, there is considerable scope for using existing and new technologies.
		The acid test for unbundling is the assessment of the associated **business** risk in this network industry, where the least hiccup is highly costly to all actors involved. This requires an assessment of the critical character of each type of service.
2. Social impact	-	Competition could lead to the abrupt consolidation of services and would require **change** management. In general, restructuring would take place in a sector serving a **growing** aviation industry. Social dialogue structures in air traffic management should provide for socially acceptable solutions and appropriate outplacement possibilities, if so required. New jobs may require geographical **mobility** in order to service installations in different Member States from a central location.

		For CNS, this could entail the outplacement of technically **skilled** employees who may be in high demand on the labour market. The impact on meteorological services may be more limited, as it would depend on finding alternative funding. Staffing in training institutes is rather limited, with the smaller academies in particular using temporary staff from universities or service providers. The measures may meet social resistance.
3 Environmental impact	+	Competition could introduce an incentive to capture markets through innovative technologies allowing for more precision surveillance and navigation, hence increasing the **environmental performance** of air traffic management. However, SESAR should bring about these changes and possibilities.

4.4. Fourth pillar: Functional airspace blocks (FABs) in the performance regulatoion framework:

Functional airspace blocks (FABs) are a major driver for change, introduced in the first SES package. This tool will now be used within an overall performance regulation framework with regulation, reinforced network management functions and unbundling.

In any event, FABs should **continue to play their full role** as a means to achieve the performance targets. In the consultations, most Member States wanted target implementation dates to be put in place for FABs. Three main options can be envisaged for FAB development:

4.4.1. *Option 1: No changes — keep the status quo*

Member States already have a legal obligation to establish FABs and meet the criteria set out in the Airspace Regulation. The Commission **continues to support** ongoing initiatives[47] through studies and some funding options. It reserves the right to adopt **common general principles** for the establishment and modification of FABs in the form of Implementing Rules, as provided for in SES I.

A **forum** on inter-FAB coordination is proposed in the shape of a sub-committee of the Single Sky Committee, where Member States will be able to exchange information and best practice on their initiatives.

Option 1 'No changes — keep the status quo'

Benefits achieved/ problem addressed	Impact:	Explanation of rating and aspects of the policy option most relevant for the benefits
1. Economic impact	-	This option would have the least economic impact. The introduction of FABs is considered to be one of the most effective ways of achieving a performance-based ATM system in Europe with subsequent cost reductions stemming from greater economies of scale. The overall added value of such initiatives will include economic benefits for airspace users in the form of cost reductions, increased capacity and

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Benefits achieved/ problem addressed	Impact:	Explanation of rating and aspects of the policy option most relevant for the benefits
		hence reduced delays due to air traffic management. The cost is difficult to estimate because of the variety of different initiatives, but the obligation to establish FABs is conditional upon a positive cost-benefit analysis. In this situation, there could be a role for the Community to play by providing financing through the TEN-T programme to alleviate the costs of transition. Providing more capacity at a lower price will induce air carriers to offer even more choice to end-users for business and leisure travel, thus achieving the Lisbon agenda objectives in terms of reducing the internal and external cost of mobility across Europe.
2. Social impact	-	The social impact is borne by airlines, which are adversely affected by constraints on growth and excessive costs, and by the EU at large because of delays incurred by passengers, poor job creation in the air transport sector and low induced job creation in the economy at large. Moreover, if the European ATM situation does not improve, this will have a negative impact on the internal market, mobility and therefore the economy.
3. Environmental impact	+	Not relevant

4.4.2. *Option 2: Clarify the current concept with a combination of statutory and non-regulatory measures*

Clarify the definition and concept of FABs so as to better reflect their relationship to service provision and airspace design. This option still leaves the decision to the Member States to establish FABs but makes integration a more useful and flexible means to reach the performance framework objectives.

Set a firm deadline for Member States to establish FABs by the end of 2012 and start a performance review of regional target settings for FABs by 2012.

Extend the scope of FABs to lower airspace by removing the limitation to upper airspace only. A forum for inter-FAB coordination is also proposed.

The requirements of military users will be taken into account not only with respect to airspace design (part of network management and FUA management) but also with respect to service provision.

Option 2 'Clarify the current concept with a combination of statutory and non-regulatory measures'

Benefits achieved/ problem addressed	Impact:	Explanation of rating and aspects of the policy option most relevant for the benefits
1. Economic impact	+	This option recognises the work already done by Member States while redirecting the focus from airspace management to the integration of service provision. Basically, it would embrace already ongoing initiatives

Benefits achieved/ problem addressed	Impact:	Explanation of rating and aspects of the policy option most relevant for the benefits
		to extend FABs to lower airspace as well. The transaction costs of service provision integration cannot be estimated at present, but may offset the benefits in the short term. In this situation, there could be a role for the Community to play by providing financing through the TEN-T programme to alleviate the costs of transition. Furthermore, the integration costs and possible gains will greatly depend on the level of integration of existing service provision. The feasibility studies for ongoing FAB initiatives have shown that higher levels of integration will provide more benefits in terms of reducing costs.
2. Social impact	+	The establishment of FABs has direct social implications, as even the lowest level of integration will inevitably require the restructuring of operations. Such restructuring, however, will affect the different functions within the ANSPs in different ways. Support functions (administrative, IT, technical, training, etc.) will see the highest mobility. On the other hand, there should be an increase in the number of operational personnel due to the forecast increase in traffic and the need for greater capacity within an FAB. However, personnel may be needed at different locations and/or for different tasks than was previously the case. This mobility will be aided by the EU licensing scheme for air traffic controllers. Leaving the initiative to create FABs to Member States means they are in a better position to handle the social dimensions of proposed initiatives at local level compared to specific solutions for FABs decided at European level. The feasibility studies for ongoing FAB initiatives have shown that higher levels of integration will provide more benefits in terms of reducing costs[48]. However, the social and socio-economic implications of integration should not be underestimated, as social tensions in the ANSPs have a direct impact on the safety and capacity of air navigation services. Efforts by the ANSPs in the social domain will be more than offset by the increased potential for job creation among airspace users and the induced effect on the economy at large.
3. Environmental impact	+	In general, FABs can be expected to improve the quality of ANS provision, promote mobility of the workforce, generate more capacity and encourage innovation, without any negative impact on the environment. In addition, increased flight efficiency will bring about significant fuel savings, yielding a positive environmental impact. Eurocontrol's PRU report for 2007 estimates that horizontal flight inefficiencies result in a 3.7% additional fuel burn. If TMA airborne delays and taxiing delays are included as well, this represents a further 3-7% fuel burn.

4.4.3. Option 3: The structural division of service provision into FABs is decided at Community level

The Commission overturns the current way of deciding on FABs ('bottom-up' approach) and organises a top-down process to establish them. This process would be based on actual traffic flows and would take into consideration the changes to the route

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[48] For example, a cost-benefit analysis of NUAC, the FAB in the Nordic region, indicates a minimum 10% annual cost savings for the merger scenario.

structures established through the proposed network management function. The Commission takes a decision on the basis of expert advice from the different network functions (design, flow management, review, etc.).

The scope of FABs is extended to lower airspace as well.

Option 3 'The structural division of service provision is decided at Community level'

Benefits achieved/ problem addressed	Impact:	Explanation of rating and aspects of the policy option most relevant for the benefits
1. Economic impact	+/-	This option would yield the optimum economic benefits for a specific FAB. However, an imposed solution for FABs would force ANSPs to work together, with may not lead to the most efficient organisation of service provision. This may offset the theoretically positive impact.
2. Social impact	--	The establishment of FABs has direct social implications, as even the lowest level of integration will inevitably require the restructuring of operations. Such restructuring, however, will affect the different functions within the ANSPs in different ways. Support functions (administrative, IT, technical, training, etc.) will see the highest mobility. On the other hand, there should be an increase in the number of operational personnel due to the forecast increase in traffic and the need for greater capacity within an FAB. However, personnel may be needed at different locations and/or for different tasks than was previously the case. This mobility will be aided by the EU licensing scheme for air traffic controllers. Efforts by the ANSPs in the social domain may be offset by the increased potential for job creation among airspace users and the induced effect on the economy at large.
3. Environmental impact	+	In general, FABs can be expected to improve the quality of ANS provision, promote mobility of the workforce, generate more capacity and encourage innovation, without any negative impact on environment. In addition, increased flight efficiency will bring about significant fuel savings, yielding a positive environmental impact. Eurocontrol's PRU report for 2007 estimates that horizontal flight inefficiencies result in a 3.7% additional fuel burn. If TMA airborne delays and taxiing delays are included as well, this represents a further 3-7% fuel burn.

4.5.   Role of Eurocontrol in the performance regulation framework:

Over the course of SES I, the Commission has cooperated with Eurocontrol in particular on the development of **technical implementing rules** under a system of mandates. There has also been some cooperation in support of mutual policies on international fora and in the collection of data and studies.

SES II would require a **number of operational network** functions that cannot be performed by the Commission. These functions require an independent network view, separate from national interests. In many cases, the nucleus of such arrangements already exists in Eurocontrol, but the organisation would need to be empowered and

focused[49] to deliver the full benefits if it is chosen to perform some or all of the network functions discussed here.

Since it contributes **only indirectly** to the attainment of objectives, a more complete discussion of the possibilities of enhancing Eurocontrol coordination to carry out network and performance functions is to be found in **Annex 6**.

5. COMPARING THE ALTERNATIVE OPTIONS

5.1. First pillar: Performance regulation

OPTIONS:	1. Do nothing / status quo	2. Local Target Setting	3.a. European Target Setting	3.b. European Regulator
Economic Impact				
Competitiveness of European airlines	- - Excessive charges result in higher prices and weaken the competitiveness of European airlines	+ Improvement. Users will be consulted on targets but decisions will remain at national level, which will perpetuate the big performance gaps between Member States	+++ A coherent and substantial improvement in operational and economic efficiency can be enforced, bringing savings on route charges, flight time and fuel burn for airspace users.	++ Same as for ETS, but in a more radical manner, as there will be no negotiations with ANSPs. The most radical approach, bringing results immediately after implementation.
Performance of ANSPs	- The differences in performance continue. There is no tool for ensuring convergence. Bad performers offset the improvements of good performers + Notional targets are agreed under Eurocontrol arrangements, without any enforceability	+ ANSPs will follow national targets, but there will be no system-wide approach and gaps in performance will remain. No strong incentive for bad performers to change behaviour.	+++ Improved service provision and economic efficiency will permit the sustainable growth of air traffic. The increased economic pressure on ANSPs, coordinated at European level, will ensure convergence of cost efficiency, capacity and	+++ Same as for ETS with probably more radical results, but offset by the time needed to set up an operational SES Performance Agency.

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[49]   Recommendation 6 of the High Level Group on Aviation Regulation (page iii of the report), July 2007.

			flight efficiency. Coordination of investment and enforcement of coherent and coordinated performance targets.	
Governance of the ATM system	- - Decisions are shared between Member States and ANSPs. Fragmentation is not reduced. The Community method is not used. NSAs have no independence from state authorities and cannot perform their performance oversight role.	= Decision-making remains at national level - - No effective use of the Community method.	+++ Initiatives are local, ensuring that local constraints and specificities are duly taken into account. The final decision is taken at European level, thus ensuring that performance is driven in a consistent way following a 'total system approach'. +++ Efficient use of the Community method for target setting through the comitology procedure. +++ The implementation of local targets is left to local level with flexibility to accommodate local specificities.	+ - Target setting and enforcement are entirely at European level. The Agency consults stakeholders but the final decision taken by the Commission. The substantial costs of such an agency will considerably exceed the costs of Option 3a.
Administrative costs	= No new costs incurred in the status quo option	- Some additional costs due to the need to create strong NSAs with separate budgets and resources. - — Additional costs for airlines,	- Need to create or designate an independent performance review body and structure. Need to upgrade NSAs to allow them to carry out performance	- — - High administrative costs: by far the most costly policy option in terms of administrative budget. The agency will require a staff of

		which will have to negotiate individually with each NSA.	oversight. Slight increase in reporting requirements for ANSPs.	at least 50 persons (€5 million per year).
End consumers	- - More costly travel because of excessive and unjustified costs. Capacity crunch may create problems for travellers and freight.	+ Slow and variable improvements may be expected, provided that ANSPs cooperate together on a voluntary basis.	+++ More capacity will be delivered. More flights at better prices will be offered to passengers by more competitive European airlines.	+++ More capacity will be delivered. More flights at better prices will be offered to passengers by more competitive European airlines.

Social impact

Employment	- No change for ANSPs. -- For airlines and the European economy.	= Limited social impact for ANSPs as they will remain masters of their cost containment efforts. = Limited improvement in the social domain. Airspace users and the EU at large will continue to bear all the social costs of the shortcomings of the system.	+++ Improved service provision and economic efficiency will contribute to the quantity and quality of jobs offered at all levels (ANSPs, airlines, industry, EU). Efforts by ANSPs in the social domain will be more than offset by the increased potential for job creation among airspace users and the induced effect on the economy at large.	+++ The improved competitiveness of airlines will generate new jobs in their sector. Improved mobility will generate more jobs in the economy at large. --- The social impact and the loss of local initiative for ANSPs will trigger resistance in particular from controllers.

Environmental impact

Air quality	-- The 'Do nothing' scenario does not address the	+ The issue will be tackled only at national level. -	+++ The ETS option brings positive and substantial improvements in	+++ The most effective scenario in terms of environmental
Climate	environmental issue. The non-optimal route network	No European action. - Airlines fly	flight efficiency and therefore for the environment. Clear	efficiency as no room for manoeuvre will be left to

	has a high negative environmental impact (several million tonnes of additional CO_2 emissions per year).	longer routes to avoid costly airspaces.	responsibility for target setting, network management and airspace regulation.	Member States. (The weak point of this scenario is that it does not in itself take into account the military / sovereignty aspects of route design.)

Conclusion:

The ETS option is the preferred one. It is expected to bring **coherent and substantial** improvements in operational, environmental and economic efficiency in a cost-efficient (low implementation costs) and socially acceptable manner. The option is acceptable for controllers and would bring wealth and jobs to the airlines and the European economy. This option better respects the principles of **better regulation** (no additional structure or process required), **proportionality** and **subsidiarity** (local initiative, use of national expertise to propose sound targets taking account of local constraints and specificities, and Community decision-making ensuring that the system-wide targets are met and enforced).

5.2. Second pillar – Network approach for a European-level network and management of scarce resources

The summary table below presents a comparison of the three options (the - sign indicating a negative impact and the + sign a positive impact).

	Economic	Social	Environmental	General feasibility
Option 1	--	-	--	+
Option 2	++	+	++	++
Option 3	++	+	++	+/-
Best:	Option 2/3	Option 2	Option 2/3	Option 2

Option 2 compromises on some of the theoretical gains to ensure political acceptability. Much depends on the quality of the consultation mechanism. If it succeeds in taking proper account of local and regional needs without negatively affecting the network view, it could achieve the same or even better results than option 3. Even if it leads to a slight reduction in the gains, its realism is still an argument in its favour. Option 3 is theoretically efficient, but suffers from low feasibility. The feasibility of option 1 also diminishes if the sub-optimal route network increasingly affects air operations and thus causes discontent.

On basis of this analysis, option 2 is the preferred solution. Network design and management should be seen as a part of the wider target setting and attainment process,

where network efficiency is just one of many factors contributing to good output. Target setting should be done at European level, with a mechanism for translating this into actions specified and overseen by the NSAs at Member State or FAB level.

The best results are normally ensured through transparent and public planning and review of the results as close to the regulated parties as possible, but for some areas like network design the main responsibility for planning actions must be at network (European) level. This is due to the fact that optimising route networks at national level resolves only part of the inefficiencies and may even worsen the situation in cases where there is considerable interaction with neighbouring countries or FABs. Only cooperation at both state/FAB and European levels, with the prime consideration being overall network efficiency, can ensure that all inefficiencies are addressed.

Therefore, only option 3 can bring about the necessary benefits by ensuring proper planning and implementation in the interest of the whole network. The process envisaged for network design is presented in more detail in **Annex 7**.

5.3. Third Pillar: Comparison of the options for the introduction of market measures for unbundled services

The impact analysis demonstrates that unbundling is not straightforward and that such decisions must be taken on a service-by-service basis. While competition in general would boost **performance**, the possible gains should be assessed against the cost in terms of the business risk. Indeed, the critical factor is the **increased risk** for safety and continuity of service.

Options/Dimensions	Decision at national level	Market opening at Community level
Economic	-/+ Performance depends on regulation. Consolidation within the framework of FABs. Control of internally provided services.	+ Competition will boost performance. Impact on FABs not clear: facilitator or obstacle. Risk of disruption may increase.
Environment	-/+ Impact if slow take-up of innovation	+ New technologies allow for greener flights.
Social	-/+ Social management of change under control. Safety of the flying public depends on introduction of new technologies.	- Consolidation may require a restructuring effort — social resentment. ATM is financed by a growing aviation industry. Safety benefits from the swift introduction of new technologies.

Conclusions: preferred option:

In order to benefit from improved performance, unbundling should be pursued after an appropriate assessment of the associated business risks. Decisions on **unbundling should be taken at Community level through comitology, after specific impact assessments.** This way of proceeding would allow consultation of stakeholders to obtain their views on the balancing of possible gains against costs. This approach is in line with previous studies, which argued for leaving decisions to unbundle at national level with a view to safeguarding continuity of service. This would also take due account of the progress achieved through FAB initiatives and performance regulation.

5.4.   Fourth pillar: FABs within the performance framework

The summary table below presents a comparison of the three options.

	Economic	Social	Environment	General feasibility
Option 1	-	-	+	+
Option 2	+	+	+	++
Option 3	+/-	--	+	-

Option 1 risks adding a need for further guidance as to the content of the current obligation to establish FABs. This is especially the case if the route network management function is at European level, leaving it to Member States to evaluate the resulting route network/traffic flow patterns in order to decide whether to establish FABs. There is no consensus on the FAB concept, resulting in a diverse set of interpretations and different degrees of cooperation and integration in ongoing FAB initiatives.

Option 2 brings clarity regarding FAB objectives, accelerating existing integration efforts and yielding efficiency and economic gains at a general level, not only in tackling flight inefficiencies. It takes proper account of the proposal to pursue route network management at European level. Much responsibility is still left to Member States since most of the aspects (operational, technical, legal, social, etc.) remain well within their competence.

Option 3 could be challenged on the basis that there is no Community competence, as it touches upon Member States' sovereignty and the defence issues relating to military requirements in Member States' own airspace. For this reason, it is probably the most political difficult option to realise. In any case, option 3 could be envisaged as a long-term step, should option 2 not deliver the desired performance improvements to service provision.

The option chosen:

On basis of the above analysis, option 2 is the option with the most positive and favourable prospects for meeting our policy objectives.

6. POLICY MONITORING AND EVALUATION

The need for a constant monitoring and evaluation process is heightened in ATM, since the nature of the system does not allow for normal market mechanisms to be used in all cases. These monitoring and evaluation processes have to ensure a reliable and full flow of information to provide legislators and policy makers with feedback on the success — or otherwise — of their actions.

SES I actions

Since the need for this kind of process was seen very early, the European ATM system is in a fortunate situation in that the core of the evaluation and monitoring system already exists. SES I built on the existing Eurocontrol tradition, with Articles 11 and 12 of the Framework Regulation setting out a set of performance review and reporting requirements to feed the process. The performance review is *de facto* based on the work of the Eurocontrol Performance Review Commission, which produces yearly performance reports on the ATM system. These reports call for European-wide performance targets, but lack legal or binding status.

Improvements in SES II — Performance Framework

In SES II, this process needs to be strengthened by creating a closed-loop structure to feed into the performance framework described in Chapter 5. Performance regulation requires a permanent flow of information to feed the review, target setting and enforcement process. SES II will therefore introduce **a continuous loop of monitoring and evaluation** for performance regulation of natural monopolies and other policy areas. In this particular case, therefore, the efficiency of legislation will be monitored by following the progress of **performance indicators** covering safety, capacity, cost-efficiency and the environment. In addition, a **political assessment** will decide on the balance between the different areas of performance according to societal needs.

Improvements in SES II — Institutional Framework

Beyond monitoring through performance regulation, the institutional set-up of the Single Sky provides for a permanent flow of information and assessments from different **stakeholders**. The Commission receives input from Member States through the Single Sky Committee, from national supervisory authorities and most importantly from the Performance Review Body. In addition, input is provided by industry through the Industry Consultation Body and by representatives of staff and employers through the social dialogue structures.

All in all, the **aviation industry**, which finances air traffic management, is given a guarantee that it will receive value for money and that the standards for air navigation provision will genuinely improve. As the aviation industry is an indispensable partner in the institutional set-up, the reporting line to the Commission on efficiency and evaluation is quite direct and also independent of the performance review framework described above.

7. TECHNICAL UPDATES OF THE FIRST SES PACKAGE

From the technical evaluation it has become apparent that the current regulations need to be modified in a number of areas to take account of the lessons learned from SES I and **technical developments** and to enable the transition from regulatory action based on Eurocontrol drafts to action based on EASA, Eurocontrol, ICAO and any other bodies that may be considered appropriate for the task at hand. In particular, the harmonised application of ICAO rules requires particular attention in the regulations.

Last but not least, there are three articles in the SES I legislation which apply only to upper airspace. It is proposed to extend the scope of these articles to lower airspace. In addition, consideration should also be given to whether the articles now referring to specific IRs need to be modified to provide for necessary updates to them, etc. A more detailed presentation of these technical updates is given in **Annex 8**.

List of Annexes

Annex 1: List of abbreviations used

Annex 2: High Level Group recommendations

Annex 3: Conclusions on the Conference of 20.01.2008 on consulting aviation stakeholders

Annex 4: List of consultations

Annex 5: Unit costs

Annex 6: Options for institutional arrangements with Eurocontrol

Annex7: Network design process

Annex 8: Technical update of SES II

ANNEX 1

List of Abbreviations

AFIS	Aerodrome Flight Information Service
AIM	Aeronautical Information Management
AIS	Aeronautical Information Services
AMC	Acceptable Means of Compliance
ANS	Air Navigation Services
ANSP	Air Navigation Service Provider
ATCO	Air Traffic Controller
ATM	Air Traffic Management
BISP	Blocks of Integrated Service Provision
Central FAB	Initiative by DE, FR, CH, BE, NL and LU for a common FAB
CFMU	Central Flow Management Unit (Eurocontrol)
CRCO	Central Route Charges Collection Office (Eurocontrol)
DAP	Directorate of ATM Programmes (Eurocontrol)
DAS	Directorate of ATM Strategies (Eurocontrol)
EAD	European Aeronautical Database (Eurocontrol)
EASA	European Aviation Safety Agency (Community)
ECAA	European Common Aviation Area
ECAC	European Civil Aviation Conference
Eurocontrol	European Organisation for the Safety of Air Navigation (www.eurocontrol.int)
FAA	Federal Aviation Administration (US)
FAB	Functional Airspace Block
FUA	Flexible Use of Airspace (between civil and military)
GA	General Aviation
ICAO	International Civil Aviation Organisation (UN)
ICB	Industry Consultation Body
INSTILUX	Institute of Air Navigation Services (training, Eurocontrol)

IR	Implementing Rule
MET	Meteorological services
Mil	Military
MS	Member States (EU)
MUAC	Maastricht Upper Area Control Centre (Eurocontrol)
NAA	National Aviation Administrations
NSA	National Supervisory Authorities
NSACB	NSA Coordination Body
PC	Provisional Council (Eurocontrol)
PRB	Performance Review Body (proposed)
PRC	Performance Review Commission (Eurocontrol)
PRU	Performance Review Unit (Eurocontrol)
QMV	Qualified Majority Voting
RVSM	Reduced Vertical Separation Minima
SAIP	Single Aeronautical Information Publication
SESAR JU	SESAR Joint Undertaking
SES	Single European Sky
SES1	First SES Package (2004)
SES2	Second SES Package (2008-09?)
SESAR	SES ATM Research Programme
SID	Standard Instrument Departure
STAR	Standard (instrument) Approach Route
SWIM	System-Wide Information Management
TEN-T	Trans-European Networks – Transport
TMA	(Airport) Terminal Area
US	United States

ANNEX 2

High Level Group Report and Recommendations

To facilitate cross-referencing between the Commission recommendations in section 4 (Accelerating the Implementation Strategy) and the High Level Group recommendations, the corresponding HLG Recommendations (HLG 1, 2, etc) are identified in the Communication:

HLG Recommendation	Subject
HLG 1	EU as a driving force in aviation regulation in Europe
HLG 2	Greater responsibilities for industry
HLG 3	Better regulation
HLG 4	Drive improved performance
HLG 5	Deliver the Single European Sky
HLG 6	Empower and focus Eurocontrol
HLG 7	Address airport capacity
HLG 8	Deliver continuously improving safety
HLG 9	Deliver environmental benefits
HLG 10	Commit Member States to deliver

The Executive Summary (below) of the High Level Group Report gives more information.

Executive Summary

Vice-President Barrot appointed the High Level Group for the Future European Aviation Regulatory Framework in November 2006 in response to strong demand from industry, EU Member States and other stakeholders to simplify and increase the effectiveness of the regulatory framework for aviation in Europe. Vice-President Barrot asked the High Level Group to present a vision for the development of the aviation regulatory framework — with a particular focus on air traffic management — and to provide a roadmap with practical next steps.

The High Level Group underlines the need for, and indeed urgency of, change in the regulatory framework for aviation in Europe. This is necessary to ensure alignment across the aviation system towards achieving shared objectives.

The High Level Group has faced a set of complex and occasionally conflicting aims when considering the performance improvement objectives:

- Aviation has a key role to play in achieving the objectives of the Lisbon agenda, in terms of reducing the internal and external cost of mobility within Europe and between Europe and the rest of the world. Like other transport modes, aviation is an important enabler of economic growth. The aviation sector itself is also a significant source of employment and technological innovation.

- At the same time capacity in the air and on the ground is increasingly scarce, the environmental impact a growing source of concern at local and international levels, while improving safety becomes ever more challenging with increasing traffic levels.

- Additionally, aviation in Europe faces growing competition from other parts of the world for the market in Europe and the global aviation market. This emphasises the importance of finding cost-effective solutions.

To determine the priorities for change, the High Level Group has reviewed ongoing initiatives to improve the European aviation system such as the Single European Sky (SES) initiative, the inclusion of aviation in the emissions trading scheme, and the Clean Sky programme. It has concluded that **the challenge for Europe is not to embark on new system changes but to focus on accelerating the effective delivery of the existing initiatives and to strengthen the capabilities of the key players to deliver them**. The High Level Group has focused on the **SES initiative in particular**. Improved ATM can play a vital role in increasing capacity and reducing the environmental impact of aviation.

The High Level Group has therefore concentrated on two main themes: **performance** and **governance**. This leads to proposals for clear roles for the European Commission, the Member States and the Eurocontrol and EASA organisations, and proposals for concrete actions to address the current and expected bottlenecks in performance. It also leads to proposals to rebalance the governance of the aviation system in Europe to enable industry (airlines, air navigation services providers (ANSPs), airports and manufacturers) to play an appropriate role in influencing decisions that affect them. This focus has been validated by a process of stakeholder (industry, the military, professional staff associations and non-EU states) consultation.

The High Level Group has followed the European Commission in taking 2020 as the target date for completing the major changes already initiated within Europe, in particular the Single European Sky. However, the High Level Group has targeted 2014 as the date by which its proposals must be implemented to ensure that the European aviation system remains safe, competitive and environmentally responsible. 2013 is the date when the SESAR deployment phase is due to start.

To facilitate the next steps, the High Level Group has outlined a roadmap for change. The roadmap provides for actions that can be started immediately and for putting in place a process of continuous change to respond to market developments. Because 2013 is a critical date, the High Level Group proposes a timely evaluation of its recommendations in 2011 to ensure that the necessary additional actions are taken.

The High Level Group recognises that its proposals represent a major change process challenge. This challenge can only be met if it fully involves the people working in the organisations involved in the change process. The High Level Group therefore urges the

European Commission to continue the process of extensive consultation with stakeholders during the decision-making process following on from the High Level Group's work. In particular, the High Level Group points to the valuable contribution that can be made by representatives from professional staff organisations and the need for inclusive social dialogue.

The proposals of the High Level Group can be summarised in the following 10 recommendations:

HLG 1 **EU as a driving force in aviation regulation in Europe:** Fragmentation is a major bottleneck in improving the performance of the European aviation system. As this can only be addressed at European level: strengthen the role of the European Community and the Community method as the sole vehicle to set the regulation agenda for European aviation by eliminating overlaps between EU and other regulatory processes, ensuring independent structures for regulation and service provision, and ensuring that safety regulatory activities are conducted independently from other forms of regulation. Drive change forward at the strategic level through regular meetings of the European Directors-General of Civil Aviation working together with the European Commission, coordinating across the governing bodies of Eurocontrol, EASA and ECAC and creating a more structured dialogue between the EU and non-EU states. Appoint a senior figure as an 'Aviation System Coordinator' to drive forward the necessary actions.

HLG 2 **Greater responsibilities for industry:** Give more responsibility to industry in line with the liberalisation of the internal market. Involve industry more systematically in the rule-making process for the aviation system. Realign the governance of service provision functions to give industry greater responsibilities within a harmonised regulatory framework. Make possible competition for contestable activities which can be executed by industry.

HLG 3 **Better regulation:** Apply the principles of better regulation, avoiding over-regulation, and undertaking full impact assessments and consultation. Apply consistent definitions and rationalise existing legislation.

HLG 4 **Drive improved performance:** Every regulatory intervention should target improving performance within overriding safety objectives. As general principles, set performance improvement objectives, maximise the use of performance incentives and require independent performance reporting. For ATM, adapt the regulatory framework and governance structures to stimulate management to deliver improved performance. Where possible, facilitate the application of market principles by the unbundling and liberalisation of ANSP services. Introduce economic regulation to drive performance improvement in the monopoly elements of ANSP activities.

HLG 5 **Deliver the Single European Sky:** Accelerate the delivery of the Single European Sky (SES) and SESAR through proactive management and annual progress monitoring and reporting by the European Commission. Translate the SES ambitions into an implementation strategy and plan. Introduce economic regulation for ATM services to ensure that ANSPs are incentivised to achieve

converging objectives in Europe and to regulate the monopoly elements of ANSP activities. Address the hurdles to implementing FABs and task the Aviation System Coordinator to facilitate their progress. Strengthen the orientation of the SESAR programme towards results, including quick wins, and develop proposals for the pan-European ATM governance structure post the SESAR JU in 2013. Increase the political support for SES and SESAR, including the military stakeholders in European ATM.

HLG 6 **Empower and focus Eurocontrol:** Empower Eurocontrol to play a key role in delivering the Single European Sky and SESAR objectives within the strategic and regulatory framework set by the EU. Focus its activities on excellent pan-European functions and ATM network design, and support for regulation as requested by the European Commission and Member States. Transfer the responsibility for safety regulatory activities to EASA. Invite the Eurocontrol governing bodies to give industry an appropriate role in the governance of the pan-European functions and facilitate the unbundling of activities through corporate structures or undertakings where appropriate to allow the Eurocontrol organisation to evolve in line with industry developments while ensuring that the interests of employees are considered. Prepare for the appropriate pan-European ATM governance and operational structures for the post-2013 SESAR deployment phase.

HLG 7 **Address airport capacity:** Address the forthcoming airport capacity crunch by asking the European Commission to raise the profile of this emerging bottleneck in the European aviation system and point the way forward in terms of reconciling growth and environment goals. Request Member States to provide strategies for addressing the airport capacity issue while demanding that airports themselves take greater responsibility for securing the local 'licence to grow'. Enable the European Commission to facilitate progress through the 'Aviation System Coordinator'. Integrate airports more systematically into the total system approach.

HLG 8 **Deliver continuously improving safety:** Require states to apply safety management principles consistently and, in particular, facilitate the uniform application of 'just culture' principles. Empower EASA as the single EU instrument for aviation safety regulation including airports and ATM, and ensure that EASA is funded and resourced accordingly. Prepare for the SESAR challenge through timely certification processes. Ensure that states' safety oversight is harmonised and that cooperation between national authorities is stimulated to achieve overall higher levels of performance.

HLG 9 **Deliver environmental benefits:** Building on the three pillars of improved gate-to-gate ATM, cleaner and quieter aircraft, and market-oriented solutions, ask the European Commission to develop an integrated environment strategy. Incorporate ambitions from the transport and environment perspectives, enabling Europe to play a leading role in balancing economic, environmental, safety and social impacts.

HLG 10 **Commit Member States to deliver:** Require more systematic implementation of existing commitments by EU Member States, in particular the

defragmentation targeted by the Single European Sky initiative. States should address inconsistent guidelines for ANSPs, performance shortfalls in oversight, bottlenecks in airport capacity and safety management, and the new challenges of mitigating and adapting to climate change. Encourage regulatory authorities to exchange best practices and develop common approaches.

The High Level Group thanks Vice-President Barrot for the opportunity to develop these recommendations and hopes that they will be acted upon without delay.

The High Level Group commends its report to the Vice-President, to the European Parliament, to Eurocontrol's Provisional Council and to the Member States.

ANNEX 3

Conference

'Towards a more performing European Aviation System'

Conclusions

22 January 2008

- The European air transport sector faces significant challenges from known areas such as capacity, safety, security and efficiency but also from new dimensions such as economics and the environment;

- The High Level Group's conclusions and their focus on enhanced governance and performance are supported by a vast majority of stakeholders;

- Aviation is an important enabler of economic growth and technological innovation, and a significant source of employment and jobs as it reduces the internal and external costs of mobility within Europe and between Europe and the rest of the world;

- Urgent need to address the cost of fragmentation of the ATM system (€3bn per year due to the inefficiencies and external environmental costs of the current system);

- The Community method confirmed as the most effective tool — better regulation and close dialogue and cooperation between all relevant stakeholders (Community, Member States, the military community, industry, the social partners and non-EU states), building on the unique expertise of Eurocontrol in ATM matters;

- The Commission to drive the change process — regulatory structures, performance framework and timely introduction are addressed and handled at Community level;

- Performance-driven approach to achieve the required improvements in safety, efficiency, capacity and cost-effectiveness, together with appropriate incentives and disincentives;

- Environmental dimension to be incorporated in the aviation system as a whole to achieve a balance between economic, environmental, safety and social impacts;

- The environment needs a comprehensive approach embracing technologies (Clean Sky, SEAR), SES and market measures (ETS);

- Pan-European approach for a European Common Aviation Area — the Single European Sky to be open to non-EU countries;

- The social dimension is essential and must be linked with the objectives of the Lisbon Agenda;

- Functional airspace blocks (FABs) are key to tackling defragmentation and efficiency;

- Member States should politically commit to the creation of FABS by 2010, with implementation by 2012;

- 'Capacity crunch' to be addressed through technological innovation from the SESAR programme together with measures to improve airport capacity;

- The implementation of SESAR is a necessity to ensure that the European aviation system will be safe, competitive and environmentally responsible;

- The Commission should be encouraged to act quickly and draw up the SES II package, including performance targets at European level, the creation of a European network manager, accelerating the introduction of FABs, and establishing a genuine performance review mechanism (in consensus with the Member States and all relevant stakeholders) by streamlining and simplifying governance elements;

- Reform of Eurocontrol; EASA as the European safety entity; partnership with the network of National Supervisory Authorities (NSAs)

- Europe to maintain its competitive position in the global aviation market in the most safe, efficient and sustainable manner.

List of consultations held for the development of SES2

A large number of consultations have been held to ensure that the second package of SES regulations truly covers all stakeholder concerns. The consultations started under the auspices of the High Level Group (HLG) on Aviation Regulation (January to June 2007) and continued as a series of bilateral and group consultations during the development of SES2 (July 2007 to February 2008). The list below contains the main consultation meetings, but there have also been many other meetings where the main subject was different but SES2 was also discussed. Unless marked 'HLG' (for High Level Group), the meetings were organised by the Commission in connection with the development of the second SES package.

1. Airspace users (end users)

Mr Martin Robinson, IAOPA	20 Mar 2007	HLG
Association of European Airlines board meeting	April 2007	HLG
Airspace Users Associations	April 2007	HLG
Airlines	19 Nov 2007	
	29 Nov 2007	
	12 Dec 2007	
	8 Jan 2008	
	15 Jan 2008	
	14 Feb 2008	
	28 Feb 2008	
Bilateral meeting with General Aviation in the context of the conference on aviation regulation	22 Jan 2008	

2. Service providers

Civil Air Navigation Services Organisation EC3 meeting	April 2007	HLG
Airport Council International	April 2007	HLG

board meeting

Bilateral meetings with Canso	6 Dec 2007	
	12 Feb 2008	
Bilateral meeting with NATS	10 Jan 2008	
Bilateral meeting with ENAV	30 Jan 2008	

3. Manufacturers

Mr Olaf Dlugi, Chair SESAR consortium executive committee	26 Jan 2007	HLG
Mr Bertrand de l'Epinois, Air Traffic Alliance	20 Mar 2007	HLG

4. National administrations & regulators

Single Sky Committee	Jan & Apr 2007	HLG
European Civil Aviation Conference	May 2007	HLG
NSA Conference	18 Oct 2007	
Single Sky Committee	9 Jan 2008	
SES2 presentation and consultation with NSAs	19 Feb 2008	

5. Military

EURAMID:	General Major Antonio Pilotto	23 Feb 2007	HLG
	Colonel Ian Logan		
	General Major Peter Vorderman		
	Lieutenant-Colonel Olivier Mrovicki		
Bilateral meeting with Mil representatives		30 Jan 2008	

6. Third countries & International organisations

Mr Patrick Goudou, Executive Director EASA Mr Ron Elder, Chair, Eurocontrol Safety Regulatory Commission Mr Keith Williams, Eurocontrol Performance Review Commission Mr Bo Redeborn, Director DAS, Eurocontrol	26 Jan 2007	HLG
Turkey, delegation headed by Mr Ali Ariduru Ukraine, delegation headed by Mr Anatoliy Kolisnik, Norway, delegation headed by Mr Heine Richardsen	25 May 2007	HLG
Eurocontrol Provisional Council	May 2007	HLG
EASA Management Board	June 2007	HLG
Eurocontrol PRU	6 July 2007	
	18 Sept 2007	
	24 Oct 2007	
	12 Nov 2007	
	28 Nov 2007	
	10 Dec 2007	
	20 Dec 2007	

7. Staff

Mr Marc Baumgartner, IFATCA Mr Danny Van Der Biest, IFATSEA Mr Joe Magee, ETF Mr François Burgues, ATCEUC Captain Heinz Frühwirth, ECA	20 Mar 2007	HLG
ETF	21 Nov 2007	
IFATCA/IFALPA/ECA	13 Feb 2008	
ATCEUC	29 Feb 2008	

8. Others

High-Level Conference on Aviation Regulation	22 Jan 2008
Industry Consultation Body (including sub-groups)	4 Dec 2007

13 Dec 2007

11 Jan 2008

21 Jan 2008

26 Feb 20

ANNEX 5

		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	1997-2008	2000-2003	2003-08
1	Slovenia	76,05	65,00	63,52	63,00	62,63	61,25	73,18	76,60	63,88	61,98	60,77	60,84	-20,00%	13,91%	-20,43%
2	United Kingdom**	74,73	79,27	76,65	81,53	83,52	84,81	83,83	82,58	82,58	81,15	81,38	78,08	4,48%	2,75%	-3,01%
3	Germany	72,61	66,56	62,56	60,50	67,82	75,02	92,26	89,31	71,31	65,06	67,37	64,93	-10,58%	34,42%	-36,94%
4	Slovak Republic	68,39	67,81	59,61	54,74	58,75	58,97	58,89	54,89	39,34	37,44	37,86	48,33	-29,33%	7,04%	-55,54%
5	Belgium - Lux.	68,11	82,04	74,63	59,61	66,70	85,12	94,98	90,63	83,65	77,78	70,95	69,52	2,06%	37,24%	-33,88%
6	Italy	64,93	64,99	64,50	63,33	56,26	57,94	67,99	68,30	69,39	72,25	67,66	67,07	3,30%	6,85%	-0,48%
7	France	61,61	61,36	59,36	54,39	52,21	58,11	61,94	61,34	60,40	61,03	60,97	58,63	-4,84%	12,19%	-1,59%
8	Austria	59,44	50,04	54,12	63,33	65,36	69,56	72,24	71,48	66,29	60,67	58,05	60,47	1,74%	12,33%	-24,45%
9	Netherlands	55,48	45,45	46,71	47,39	52,88	58,10	65,74	61,22	53,51	49,19	47,67	59,64	7,50%	27,91%	-37,91%
10	Denmark	54,38	51,83	51,67	52,08	51,90	53,58	63,48	64,27	56,78	56,78	55,11	59,39	9,22%	17,96%	-15,19%
11	Spain Continental	51,37	47,80	44,11	44,44	48,99	59,19	71,34	71,34	71,77	72,45	76,64	79,61	54,96%	37,71%	6,91%
12	Czech Republic	48,81	45,03	45,76	36,35	34,51	35,78	36,32	28,05	26,45	31,94	40,91	41,43	-15,13%	-0,07%	11,21%
13	Spain Canarias	48,22	45,90	43,11	43,85	50,01	59,33	66,76	66,76	65,87	66,49	67,75	67,23	39,41%	34,32%	1,47%
14	Sweden	46,52	49,20	47,99	44,43	54,65	55,23	59,11	62,33	50,61	46,23	46,28	52,20	12,21%	24,84%	-27,73%
15	Malta	43,38	34,31	34,85	33,49	44,04	40,16	36,35	28,73	31,85	34,24	34,81	26,97	-37,82%	7,86%	-4,42%
16	Portugal Lisboa	35,91	39,57	40,84	37,86	40,25	53,29	52,04	50,80	48,84	51,87	48,22	46,75	30,19%	27,25%	-7,92%
17	Greece	34,87	25,60	18,95	30,57	37,13	38,23	44,05	38,03	36,66	38,69	44,18	44,82	28,54%	30,60%	0,29%
18	Hungary	23,73	24,59	22,99	26,71	28,64	34,49	39,09	37,70	34,62	30,80	28,09	33,64	41,74%	31,66%	-39,15%
19	Cyprus	22,62	25,14	24,15	23,25	19,42	24,76	31,23	33,46	34,56	32,50	35,61	34,02	50,40%	25,57%	12,30%
20	Ireland	20,92	21,87	22,04	20,63	19,46	21,42	28,35	31,88	30,91	31,31	24,95	28,14	34,51%	27,22%	-13,63%
21	Portugal S. Maria	12,44	14,50	19,68	16,15	12,57	20,81	20,82	17,69	14,80	14,74	13,29	15,04	20,87%	22,47%	-56,68%
22	Finland							38,91	39,02	38,07	38,07	38,09	38,23	40,44			-2,07%
		49,74	47,99	46,56	45,60	47,99	52,00	57,23	55,70	51,46	50,58	50,31	51,69	3,92%	20,32%	-13,76%

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Options for cooperation with Eurocontrol

1. Specificities of the problem

For the creation and further development of SES, the European Commission has been tasked with developing implementing rules, Community specifications and various support actions in increasingly technical areas. Traditionally, the Commission has not possessed the technical expertise to do this and even recent plans for the extension of EASA to aerodromes and ATM/ANS cover only the safety-related aspects. For SES1, therefore, the Commission has made use of the technical competence of Eurocontrol and the European standardisation bodies for its legislative work.

In the SES2 context, the role of centralised functions to manage the network and scarce resources is becoming increasingly important. The successful implementation of SESAR also requires all actors to be mobilised in coordinated support of ATM modernisation. The current institutional structures have not been designed for this purpose, so the current organisational set-up needs to be enhanced. This need was also foreseen by the High Level Group on Aviation Regulation, which recommended that Eurocontrol should be empowered and focused

> 'to play a key role in delivering the Single European Sky and SESAR objectives within the strategic and regulatory framework set by the EU. *[It should]* focus its activities on excellent pan-European functions and ATM network design, and support for regulation as requested by the European Commission and Member States.'[50]

As noted by the Group, however, this role cannot be performed by the organisation in its current shape. The Eurocontrol organisation has grown steadily over recent decades both in the number of staff and variety of tasks. While it has undeniably performed quality work in various areas, the organisation has grown more in response to diverse initiatives for new work than in response to a clear and systematic customer-needs approach. In doing so, the organisation has transformed from the original idea of a single ANSP for upper airspace into an organisation that still has service provision elements, but is also involved in pan-European functions, research, development, regulation and training and at the same time lacks clear direction or focus. This spread of tasks has led to problems in three main areas:

(1) *Potential:* The pan-European functions (PRC, CFMU, EAD, etc.) show good potential and some very high quality work, but are not given the appropriate priority in the current organisation. By their nature, they are areas that benefit from centralisation (coordination and planning tasks requiring a network-centric view, straightforward collection tasks that benefit directly from economies of scale, and data distribution, which for technical reasons needs to be planned centrally to ensure the provision of consistent and high-quality datasets) and

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[50] Recommendation 6 of the High Level Group on Aviation Regulation (page iii of the report), July 2007.

contribute significantly to the running of the European-level network. Unless these functions can be run efficiently, it is not meaningful to implement the enhanced network functions of SES2, as they would suffer from the same limitations as the current system.

(2)   *Problem of focus in the current organisation:* The current organisation has spread in all directions in search of a *raison d'être,* which leads to a need to prioritise tasks in order to ensure the best added value for the organisation's members. While still a good platform for regulatory drafting and pan-European mandates, its work would benefit from clearer prioritisation.

(3)   *Budgetary problems and delivery rates:* airspace users in particular and some Member States have voiced concerns over the non-optimal use of resources and the need to improve productivity:

   (a)   Many units and programmes overlap with one other (4 safety units, 2 frequency units etc.)

   (b)   Few programmes have been fully implemented (with the notable exception of the Reduced Vertical Separation Minima (RVSM) programme)

   (c)   Over 40% of the annual agency budget (over €700m) is taken up by the programmes[51], but these activities are increasingly covered by SESAR. They thus need to be strictly aligned with the SESAR programme, which for both the Commission and Eurocontrol is the primary driver of technological development.

2. Options

In order to meet the SES2 objectives, three main options could be considered (NB this part of the assessment does not consider the costs and benefits of actually having such centralised functions as network design and management or allocation of scarce resources. Those parts of the impact assessment dealing with performance targets and the network functions present the anticipated costs and environmental gains. Eurocontrol is a tool for realising these tasks and hence its gains are related to those of network functions as a whole. As noted elsewhere, these aim to cut route lengths by an average of 48 km and save approximately half a million tonnes of CO_2 emissions per year).

The current situation is not assessed as an option, as it appears that its possibilities have been exhausted over the course of SES1. The Community has attempted to use tools such as Community coordination to drive Community policies, but as decision-making is based on unanimity, this has not had sufficient effect. Furthermore, most important

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[51]   Based on the presentation of the 'Functional Budget' to the Standing Committee on Finance on 4 October 2007. Note that all budgetary and staff figures are only approximations due to the transparency problems with the organisation's budget, as often pointed out by both states and airspace users on the Eurocontrol Provisional Council.

policy decisions are taken at level lower than the Eurocontrol Provisional Council, so the problem is more one of governance than Community action.

Option 1 — Transformation into a Community Agency

The first option is to transform the current Eurocontrol organisation into a Community agency. This would require an international agreement between the European Community and those Eurocontrol states that are not EU states. The agency would concentrate on rule preparation and support for policy-making for the Community and on the semi-operational pan-European functions, such as flow management, network design, route charges collection, and allocation of scarce resources. The agency could also have a more limited and focused role in supporting SESAR in validation, maintenance and updating activities.

Option 2 — Maintaining Eurocontrol for third state needs, but creating a separate Community agency for SES2

A second option could be for the Community to take the initiative independently and create a Community agency for the above tasks. This would be done through the normal EU decision-making process and the current Eurocontrol organisation would continue to exist for the needs of third states. The new agency would concentrate on rule preparation and support for policy making for the Community and on the semi-operational pan-European functions, such as flow management, network design, route charges collection, and allocation of scarce resources. The agency could also have a more limited and focused role in supporting SESAR in validation, maintenance and updating activities.

Option 3 — Refocusing of Eurocontrol on its core tasks

A third option would be to maintain Eurocontrol as an international organisation, but refocus it on its core tasks. This could be done through a similar system of Community mandates as is used today for rule preparation and would allow the third states to continue as fully fledged members of the organisation. The core functions of Eurocontrol would be based on its current strengths and concentrate on the semi-operational pan-European functions, such as flow management, network design, route charges collection, and allocation of scarce resources as well as on rule preparation and support for policy-making for EU and third countries. If the programme activities (currently spread over three directorates) can be reformed to avoid overlaps and internal discontinuities and to improve strategic focus, the organisation could also have a central role in supporting SESAR in validation, maintenance and updating activities. Retaining the programme activities would also increase the synergies gained from having the data sources for the pan-European functions in the same organisation as the programmes, which can make use of them and vice versa.

3. Comparing the options

Option 1 — Transformation into a Community agency

Many legal and institutional difficulties exist, since there is no precedent for turning an intergovernmental organisation into a Community agency.

Economic impact

Assuming that the Community agency could continue to be funded through the route charges system, its financial basis would be secure. However, it is uncertain as to what extent this can be done, as at least the regulatory support tasks should probably be funded preferably through the Community budget as is the case for EASA. Looking at the issue from the Community perspective, the new agency would be a departure from the traditional format of Community agencies, both in terms of size and tasks. It would be far larger than any other Community agency in terms of staff, and would be performing tasks that are more geared towards actual operational needs than those of the current agencies or the Commission.

The agency would have a disproportionate share of expenditure among the Community agencies, and introducing new efficiencies would probably be somewhat difficult in an agency transferred together with its personnel and internal culture from a different environment. On the other hand the *de-facto* dismantling of the current organisation would cause much uncertainty and disruption of work, and it is uncertain whether the final goal of a fully functioning agency can be achieved. Third parties could be encouraged by the transformation process to influence it in ways diverging from Community objectives. It would be especially harmful if there were any disruption to the pan-European network services, as these are central to the realisation of SES2.

This option threatens to sidetrack the Community machinery, which is more regulatory than operational. It would create a large Community agency, without actually tackling the underlying problems of the organisation and fragmentation of European ATM. It could thus be seen only as a first step towards reforming the organisation.

Social impact

The social impact concerns mainly Eurocontrol's staff[52], who would become regular Community contract agents. As many of them have permanent international civil servant contracts with somewhat better benefits and grades than is usual in the Community (NB Eurocontrol uses a modified Community personnel statute), there would be both fears of reduced work-related benefits in the agency and concerns about different treatment compared with other Community institutions. Equally, the numerous contract agents in Eurocontrol would face changes in their employment conditions.

Environmental impact

No difference in environmental impact between the different options can be found.

Conclusion

This option is certainly possible and would be achievable with a relatively limited social impact. However, it would be only the first step towards the ideal solution and the new body would risk becoming a misfit within the internal system of Community agencies. In the long run, however, the option would bring the required benefits.

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[52]   The Eurocontrol organisation currently has over 2900 staff, divided between permanent officials, temporary staff and an increasing number of contractors.

Option 2 — Maintaining Eurocontrol for third state needs, but creating a separate Community agency for SES

Economic impact

Since the first option is likely to be difficult to achieve, due to the need to include third countries in the work of a Community agency (and to get their unanimous agreement for its transformation from an international organisation), a second option could be for the Community to take the initiative independently and create a Community agency for the tasks in question. Compared to the first option, this yields a clear economic benefit, but is naturally not without cost either. The creation of a new Community agency from scratch would have an impact on the Community budget and an elaborate economic arrangement would have to found in order to avoid a situation where all the cost is borne by the EC budget (continuing to cover most of the cost through route charges is the most likely alternative). The agency would still have a large share of staff and expenditure compared with the other Community agencies and its tasks would differ from traditional agency tasks, but at least the budgetary impact would be limited.

While setting up the agency would be relatively straightforward, it would however create a situation where the Community would have to renounce its membership of Eurocontrol and withdraw from the organisation. The current Eurocontrol agency would continue to exist for the remaining non-EU members but its usefulness would be greatly reduced, e.g. retaining network management or coordination tasks in what would then be a geographically splintered area would be nonsensical. It is therefore likely that after a while the third countries would elect to bring the remnants of the organisation within the Community system.

Social impact

The social impact of this option would be much greater than in the first option. It would make the majority of current Eurocontrol staff redundant and put the whole organisation in a precarious situation. This would be guaranteed to cause social unrest and have a most negative impact on the lives of the employees, even if they would most likely move to the new agency. The only positive social effect would be avoiding disparity in terms of employment between Commission staff (and possibly also saving money due to lower employment costs in Commission agencies).

Environmental impact

No difference in environmental impact between the different options can be found.

Conclusion

This option is easier to achieve for the Commission than the first option, but would create much more social problems in the residual Eurocontrol agency. In all likelihood, the operational and social problems would be such that eventually third states would agree to merge the two entities into one, thereby creating option one, but through a more circuitous way. Furthermore, as EASA has already been created as the Community agency for aviation safety, the creation of a second EC agency for aviation might generate concerns about overlap and poorly coordinated regulatory initiatives. For the Community, the second option would bring benefits faster than the first option, but with

an obvious cost to the wider European ATM system and with a need to reconsider the role of EASA.

Option 3 — Refocusing and empowering Eurocontrol in its core tasks

Economic impact

Compared to the previous two options this option would have negligible economic impact on the Community budget, as none of the operations would be covered by it. It would also avoid many transition costs as staff would continue to be employed by their current employer on current terms. For the wider ATM system, the option is either cost-neutral or, if other parts of the organisation are also reformed (see below), could yield significant financial gains. The option also offers the advantage that it would not need a transition period to a new scheme and thereby would allow work to commence without delay on the various functions assigned to Eurocontrol in SES2. The fact that staff are already working on the same issues that need to be tackled for the SES2 network and performance review functions gives them a flying start and enables the SES2 benefits to be achieved much earlier. While it is true that in the long run the same benefits can also be attained by setting up a Community agency, using a focused Eurocontrol as a tool to this end would save several years of work and avoid the uncertainties inevitably associated with such a major undertaking as creating a new agency.

Social impact

Socially, this option would initially have a positive impact since the Eurocontrol organisation would be given a new or at least a much stronger mission. It would reassure the staff of their future — a question that has essentially remained unanswered due to the constant reorientations in the past. In the longer run, the possible additional reform of Eurocontrol could cause problems, unless it is planned well in advance and carried out using 'soft' methods, such as not filling the posts of retired personnel.

Environmental impact

No difference in environmental impact between the different options can be found.

Conclusion

It appears that while all three options are possible and would over time bring the desired benefits, it is the third option that would achieve them with the least cost and social unrest. Politically, it is the most feasible option, since it is mostly a question of tweaking an existing organisation to empower and focus it. Options 1 and 2 would also make the position of third states more difficult, hence giving rise to concerns and possible resistance to change, while option 3 enables them to continue to participate as full members in the same organisation and reap similar benefits as EU Member States. Considering that option 3 would also be able to utilise the existing expertise in Eurocontrol to the full without having to go through lengthy periods of hiring and training personnel, it should be retained as the primary strategy. Early contacts with Eurocontrol have indicated great understanding for Community objectives and, most importantly for the feasibility of option 3, a sincere commitment to reform.

4. Option chosen: Refocusing and empowering Eurocontrol in its core tasks

After consideration of the various options it is evident that the Eurocontrol organisation should be realigned with SES implementation so as to build on its main strengths and avoid overlap with areas where either the Member States, Air Navigation Service Providers or the Community (SES/SESAR/EASA) are primarily active (option 3). Although the choice between the different options does not have a long-term impact on the objectives for flight efficiency, the environment or performance, it is the limited side-effects and the promise of speedy implementation that tip the scales in favour of this option.

However, it has to be kept in mind that if option 3 becomes impossible to implement, option 2 is also feasible as a back-up since its budgetary impact is limited (due to financing through route charges after the build-up period) and it would eventually bring the same benefits as the other options.

The next chapter develops the proposal to reorient Eurocontrol towards those areas that are not core tasks for the Community but which nevertheless benefit from coordinated action on a European scale. It will not go into detail on how the Community structures (especially EASA, when it develops to its full potential) cover regulatory functions, SESAR coordinates R&D actions, and pure service provision is returned to the ANSPs. These aspects are considered in more detail in their respective sections.

The new format chosen for the organisation should also enable a reinforced Performance Review Body to conduct fully independent reviews of the organisation and its mission. These reviews should then lead to recommendations for improvements and Community performance targets and aid the efficient oversight of the organisation.

In conclusion, we believe that the best option is to empower and focus Eurocontrol to perform certain key functions on behalf of the Community in order to successfully achieve the Single European Sky. The revised Eurocontrol Convention (which has been pending for a decade) should be ratified only after the internal reform on governance, transparency and focus has taken place.

5. Core functions of a refocused and empowered Eurocontrol

The core functions of a transformed Eurocontrol organisation should be built around the successful pan-European functions. No stakeholder seems to dispute that these functions should be run from a centralised location and that the Eurocontrol agency has done a good job in the actual operational running of these systems.

The main current pan-European services are the Central Flow Management Unit (CFMU), the Central Route Charges Office (CRCO), the European Aeronautical Database[53], the Central Office for Delay Analysis (CODA), and the Height Monitoring Service in support of RVSM applications.

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[53] EAD, which will probably form the seed for the Community Single Aeronautical Information Service.

These services are all located in Eurocontrol, because by their nature they would be less efficient to run if performed in a distributed manner at national or regional level. Many of these services also provide an impartial network link between the actual ANSPs. It is therefore unlikely that any efficiencies would be gained by having these activities performed directly by states or their service providers. With increased responsibilities following the revision of the Single Sky legislation, the independence of these functions from the individual interests of various stakeholder groups would also need to be guaranteed even more than today in order to ensure a true network approach.

In the increasingly technologically interdependent European ATM system, the number of functions that need to be performed on a pan-European level is likely to increase. Good examples of such new functions are the network design function and the coordinated procurement function planned in SESAR. Further likely candidates for tasks to ensure the efficient use of scarce resources are the coordination of frequency allocation and the coordination of transponder codes. As with the CFMU or CRCO, these tasks are most efficiently done from a single location and need to be kept separate from actual ANSPs to ensure impartiality. It should also be considered whether the performance review function should be located with the pan-European services, or whether it should report directly to the Commission. The SES2 legislation needs to enable such tasks to be performed as they arise, if need be through implementing rules.

The 'New Eurocontrol' organisation would continue to operate as an international organisation, thus easily allowing non-EU states to participate. The current problems of non-enforceability and voluntarity are much less problematic in an organisation that is focused on operational tasks, and the remaining problems in this regard can be solved for the EU Member States by using the regulatory powers of the Commission. While the organisation would not be part of the Community structure, it would however be entrusted with the performance of functions for the EU through Commission mandates, given after consultation of the Single Sky Committee and the Industry Consultation Body.

Some well-focused development capability has to be retained in this new organisation, but this capability should target the areas that it serves. SESAR JU should clearly be the main client for this part of the organisation and a close — perhaps even institutionalised — coordination mechanism has to be created between the two entities to ensure that there is no deviation from the SESAR Joint Undertaking objectives as set out in the Council Regulation. The organisation would similarly participate as an ATM network expert in rule-making within groups of experts managed by EASA, or lead the work under mandates from the Commission or third states.

ANNEX 7

Network Design and Management Process

1. Process

Key to success of this function is that the process by which it reaches decisions is transparent and considered fair.

- The decisions must be based on open consultation of all airspace users, the military and ANSPs

- The decisions must be based on the combination of routes that best achieves the stated objectives (the order of importance for these also needs to be transparently stated)

    - Flight efficiency

    - Environmental friendliness

    - Acknowledgement of the fact that routes with more demand get priority

    - In conflict cases, the good of the whole network has to be taken into account. Where other modes of transport are available (especially environmentally friendly forms such as rail), the routes in question have to give way to those that have no such alternatives

    - Other needs that arise over time

- The final form of the network is decided by the network design function and approved in the Network Sub-Group of the Single Sky Committee, using qualified majority voting.

- It constitutes an input from the Network Manager

The flow of the network design and management process could be based on a two-level input, with states ensuring input at national/FAB level and the network function at European/global level. A possible process could be as follows:

(1)   The Member States arrange consultation with all three groups of airspace users (Mil, GA, airlines) and the ANSPs at national level to discuss the needs for improving the route network. The Member States will then consolidate this input and present the national proposals at European level, also indicating the differing opinions of airlines, the military, GA or ANSPs and why they have not been taken on board. If a Member State is involved in an FAB, this part of the process is performed through cooperation between the FAB-NSAs at FAB level.

(2)   Once the network design function has received the Member States' input, it performs its own planning process, feeding into it both the Member States' input and its own expert view of what is needed to optimise the overall network. At

this stage, it is obvious that compromises have to be made between national interests and the efficiency of the network as a whole.

(3)   The network design function publishes an 'initial network plan' for consultation with the representatives of all three groups of airspace users and ANSPs at European/global level.

(4)   Once the network plan is finalised, it is submitted to the Network Sub-Group of the Single European Sky Committee for final approval using qualified majority voting.

(5)   The approved 'Community Network Plan' is published through the Single European AIS service. It is also communicated to the appropriate ICAO bodies, and constitutes the infrastructure requirements (navigation, communication, information, etc.) for the Network Manager

(6)   The appeal process provides for appeal first to the Commission, which bases its assessment on the independent advice of the Performance Review Body and a hearing of all relevant parties. However, this appeal process should not delay the implementation of the plan.

(7)   In its annual reports, the Performance Review Body will also assess the functioning of the network design process and the network design function and propose improvements.

2. Enforcement

The decisions reached have deadlines for implementation and are legally binding on states (important since ANSP structures change). If states do not implement the routes an infringement procedure can be started if 'name & shame' through the performance review is not enough.

ANNEX 8

Technical Updates of SES I

1. Adapting to technical progress since SES I

The Airspace Regulation provides for the creation of a Single Aeronautical Information Publication (SAIP) for upper airspace. Meanwhile, development work has started on updating traditional paper-based AIS (of which AIP is the main publication) to modern electronic Aeronautical Information Management (AIM), with its improved products and tools. We also need to ensure that the new SAIP, which is a 'safety-of-life' service, is at the forefront of this development and provides a comprehensive integrated briefing facility ('Common Integrated Briefing Portal'?). In addition to the need to support the global modernisation work performed by ICAO, Eurocontrol and many states, one of the major motivations for the update of SAIP to provide a safety-of-life public service is that the 2007-2008 Eurocontrol study on airspace infringements has identified the lack of readily available comprehensive and high-quality briefing facilities as a major cause of airspace infringements and related safety hazards. The Community should take the lead here and provide for a 'standard' solution that may be augmented by value-added service providers.

Rules on the Flexible Use of Airspace (FUA) by military and civilian airspace users have been put in place in SES I, but need to be strengthened to reap the full benefits in terms of capacity and efficiency.

The Community instruments for extending our regulatory philosophy beyond direct EU membership have developed greatly during the years SES I has been in place. We should take this into consideration in the articles providing for work with third states.

Since the goals of SES II are broader than those of SES I, we also need to change the focus of the regulations from just capacity to efficiency, environmental friendliness and smooth functioning of the system in accordance with airspace user needs.

The text on the harmonisation of airspace classifications needs to be updated so that it no longer refers to the now defunct Eurocontrol airspace strategy, but concerns a normal stand-alone Commission activity.

The current work on creating harmonised European Rules of the Air should be explicitly highlighted in the regulations.

We need to improve the flexibility of the basic regulations to allow us to propose and adopt rules as we go along, thereby better responding to the needs of a changing technical environment.

2. Facilitating EASA extension to ATM

The competences of the European Aviation Safety Agency (EASA) are being extended to cover ATM/ANS as well. The current SES I only provides for the development of rules with the support of Eurocontrol or the European standardisation bodies, so provision has to be made for rule development with the aid of any appropriate body.

We should also consider harmonising SES and EASA terminology, since we have several concepts that are very similar or even identical in substance, but use different terms due to the history of their development (for example, AMC vs EC Specifications or NSA vs NAA, etc).

The implementation of Eurocontrol Safety Requirements (ESARRs) has also been achieved, so we should update the article accordingly so as not to have a situation where we are bound to implement all ESARRs that Eurocontrol may develop in future — especially since EASA will be the body responsible for safety regulation.

3. Extending the remaining SES I concepts to lower airspace

SES I has four concepts (FABs, SAIP, EUIR and route & sector design) limited just to upper airspace, unless Member States specifically see the need to extend them to all airspace. It has since become evident to the Commission and stakeholders that the altitude limitation is irrelevant in normal life. Airspaces are not normally divided at 28500 feet and, for example, all FAB projects currently cover all the airspace. Maintaining the division between upper and lower airspace would only contribute to unnecessary fragmentation and thus run counter to the objectives of SES. This view was also confirmed by a major Member State at the conference of 22 January 2007.

We should therefore modify Articles 3, 5 and 6 of the Airspace Regulation to cover lower airspace and delete Article 2 on the division level as redundant. The text on route and sector design should also be modified to take into account the network design function described above and provide for airspace design, general rules and/or guidelines stating that airspace design is performed at local level taking into account traffic demands and complexity and including a proper consultation of all airspace users.