



Brussels, 7.12.2015
SWD(2015) 261 final

COMMISSION STAFF WORKING DOCUMENT
Accompanying the document

**Communication from the Commission to the European Parliament, the Council, the
European Economic and Social Committee and the Committee of Regions**

An Aviation Strategy for Europe

{COM(2015) 598 final}

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Abbreviations

ACARE	– Advisory Council for Aviation Research and Innovation in Europe
ACC3	– Air Cargo or Mail Carrier Operation into the EU from a Third Country airport
A-CDM	– Airport Collaborative Decision Making
ACI	– Airport Council International
AdP	– Aéroports de Paris
AEA	– Association of European Airlines
AENA	– Aeropuertos Españoles y Aeronavegación Aérea
AF-KLM	– Air France - KLM
AMS	– Amsterdam Schiphol Airport
ANS	– Air Navigations Services
ANSP	– Air Navigation Service Provider
AOC	– Air Operator's Certificate
ASD	– Aerospace and Defence Industries Associations of Europe
ASEAN	– Association of Southeast Asian Nations
ATAG	– Air Transport Acton Group
ATC	– Air Traffic Control
ATCO	– Air Traffic Controller
ATFM	– Air Traffic Flow Management (delay)
ATM	– Air Traffic Management
ATRP	– Air Transport Regulation Panel
AV-CERT	– Aviation Response Emergency Team
BASA	– Bilateral Air Safety Agreement
CAT	– Commercial Air Transport
CDG	– Paris Charles De Gaulle Airport
CEF	– Connecting Europe Facility
CEO	– Chief Executive Officer
CESE	– Central, Eastern and South-East Europe
CO ₂	– Carbon-Dioxide
CPC	– Consumer Protection Cooperation
CRS	– Computerised Reservation System
DG MOVE	– Directorate General of Mobility and Transport
DG DEVCO	– Directorate General for International and Development
DFS	– Deutsche Flugsicherung GmbH
EAACC	– European Aviation Crisis Coordination Cell
EASA	– European Aviation Safety Agency
EASP	– European Aviation Safety Programme
EASp	– European Aviation Safety Plan
EC	– European Commission
ECAA	– European Common Aviation Area
ECAC	– European Civil Aviation Conference
EEA	– European Economic Area
EESC	– European Economic and Social Committee
EFTA	– European Free Trade Association
EGTS	– Electric Taxiing System
ENAIRE	– A Spanish ANSP
EoSM	– Effectiveness of Safety Management
ETF	– European Transport Workers' Federation
ETS	– Emission Trading System
EU13	– Estonia, Lithuania, Latvia, Poland, Czech Republic, Slovakia, Hungary, Romania, Slovenia, Bulgaria, Croatia, Malta, Cyprus
EU15	– Ireland, United Kingdom, Sweden, Finland, Denmark, Germany, Austria, France, the Netherlands, Belgium, Spain, Portugal, Italy, Luxembourg, Greece

EUROCAE	– European Organisation for Civil Aviation Equipment
EY	– Ernst & Young
FAA	– U.S. Department of Transportations' Federal Aviation Administration
FAB	– Functional Airspace Block
FSC	– Full Service Carrier
FPI	– Service Foreign Policy Instruments of the European External Action Service
FRA	– Frankfurt Airport
FTE	– Full Time Equivalent
FTO	– Flight Training Organisation
GAMA	– General Aviation Manufacturers Association
GCC	– Gulf Cooperation Council
GDP	– Gross Domestic Product
H2020	– Horizon 2020
IAG	– International Airlines Group
IATA	– International Air Transport Association
ICAO	– International Civil Aviation Organisation
ICT	– Information and communication Technology
ILO	– International Labour Organisation
ITF	– International Transport Workers' Federation
KLM	– Koninklijke Luchtvaart Maatschappij (airline)
LCC	– Low Cost Carrier
LH	– Lufthansa
LHR	– London Heathrow Airport
MUC	– München Airport
NACE	– Statistical classification in the EU
NATO	– North Atlantic Treaty Organization
NATS	– A UK ANSP
NextGen	– Next Generation Air Transportation System (US)
NGO	– Non-Governmental Organisation
NIS	– Networks and Information Security
OAG	– Official Airline Guide
OECD	– Organization for Economic Cooperation and Development
OPS/AIR/FCL	– Operations/Air Worthiness/Flight Crew Licencing
OR	– EU outermost region
OSS	– One-Stop-Security
PSO	– Public Service Obligation
PwC	– PriceWaterhouseCoopers
RAT	– Risk Analysis Tool methodology
RP2	– 2nd Reference Period
RPAS	– Remotely Piloted Aircraft System
RPK	– Revenue Passenger Kilometre
SAFA	– Safety Assessment of Foreign Aircraft
SES	– Single European Sky
SESAR	– Single European Sky ATM Research
SJU	– SESAR Joint Undertaking
SME	– Small and Medium Enterprise
SRIA	– Strategic Research and Innovation Agenda
SWIM	– System Wide Information Management
TAW	– Temporary Agency Workers
TCO	– Third Country Operator
TEN-T	– Trans-European Transport Network
TTE Council	– Transport, Telecommunication and Energy Council
UAE	– United Arab Emirates
UCPD	– Unfair Commercial Practices Directive
UCTD	– Unfair Contract Terms Directive

- USD
 - WGACS
 - WCO
- US dollar
 - Working Group on Air Cargo Security (of ICAO)
 - World Customs Organisation

CHAPTER I

'THE SUCCESS STORY OF EU AVIATION'

1. A history of EU Aviation Policy

Europe has been striving to advance aviation with an entrepreneurial spirit since its early days. From the invention of the *Montgolfière*, throughout the era of airships towards first fixed wing aeroplanes, from the establishment of the oldest airline in the world still operating under its original name¹, and the opening of the world's first airport duty free shop to the great pan-European project of Airbus which is manufacturing the largest commercial airliner of our days: European pioneers have a history of shaping global aviation and European regulators have aimed to match the pioneering spirit of those entrepreneurs and engineers by creating EU aviation policy – a regulatory framework to enable European aviation to safely advance and contribute to jobs and growth in the sector and the wider economy and ultimately to prosperity of EU citizens.

Air transport – a traditionally highly regulated sector: International air transport has traditionally been governed by bilateral agreements between individual countries, restricting the number of airlines on the routes concerned, the number of flights and the possible destinations. States considered aviation a strategic sector and aimed for equal sharing of the market between the designated air carriers of the respective parties, typically the government-owned flag carrier. Bilateral air transport agreements often provided only restricted market access, and regulated the level of competition (number of frequencies, routes, pricing).

Creation of the single aviation market: Over the last 20 years there has been a revolution in the economic and regulatory landscape of air transport in Europe. Before 1987, air transport services between EU Members States were also governed in the fragmented and protected legal framework outlined above. Since then, the EU has gradually moved to a single aviation market through a series of packages of legislation: The "First Package", (14 December 1987) started to relax the established rules. For intra-EU traffic, it limited the right of governments to object to the introduction of new fares. It gave some flexibility to airlines concerning seat capacity-sharing. The "Second Package" (27 July 1990) continued liberalisation efforts in the same areas, allowing greater flexibility over the setting of fares and capacity-sharing. It also gave all EU carriers the right to carry an unlimited number of passengers or cargo between their home country and another EU country (direct cross border market for air services, the right to fly from one country to another and back or "3rd and 4th freedom traffic rights")². The "Third Package" (23 July 1992) fully liberalised tariff setting, capacity, market access, introduced the possibility of Member States to tender public services obligations (PSO) and harmonised requirements for an operating licence for EU airlines. After a transitional period until 1997, EU carriers also gained the right to operate a route within another Member State (so called "Cabotage") which was an unprecedented step in international air transport.

Development of the EU's External Aviation Policy: In 2002, the European Court of Justice ruled that bilateral aviation agreements of Member States with third countries were in breach of fundamental provisions of the EU Treaty ('freedom of establishment') as they did not allow airlines from other Member States to benefit from the provisions of those agreements. For example, a German airline established in France could not benefit from the traffic rights accorded in the agreement between France and Australia. These rights were only available to French airlines. Consequently, the EU additionally developed its external aviation policy to restore legal certainty by negotiating Horizontal Agreements. By 2015, 50 Horizontal Agreements had been concluded which

¹ KLM (Koninklijke Luchtvaart Maatschappij) was founded in 1919.

² See Freedoms of the Air (Annex 1).

modified in total more than 1000 bilateral air services agreements of Member States with third countries.³ The 2012 Communication on the EU's External Aviation Policy which has been endorsed by the Council⁴ and the European Parliament⁵ and stresses the importance of aviation for the EU's economy, growth and jobs and recovery after the financial crisis and serves as guidance for policy-making, action and external aviation relations both at EU and Member State level: Its main aims are to liberalise market access to third countries while ensuring regulatory convergence and a level playing field for open and fair competition in international aviation.⁶

Towards EU-level agreements: Airlines still have less commercial freedom when flying to many countries outside the EU and passengers have less choice. Beyond merely restoring legal certainty, the EU's external aviation policy therefore additionally aims to overcome continued fragmentation and restricted market access for the benefit of EU industry and citizens. EU Member States can still negotiate individual bilateral air services agreements, until the Council grants to the European Commission a negotiating authorisation for negotiating a Comprehensive EU Agreement. Comprehensive EU Agreements supersede the bilateral agreements of EU Member States with the respective third country and in their scope go beyond liberalising traffic rights. They also include comprehensive – hence the name – provisions to address and synchronise the regulatory conditions for open and fair competition and for a sustainable aviation industry including essential aspects such as safety, security, environment and economic regulation. The Council grants the Commission the authorisation to negotiate such agreements on a case-by-case basis. There are two main sub-groups of Comprehensive EU Agreements: Firstly, Neighbourhood Agreements⁷, which aim at including a third country into a wider "Common Aviation Area" of the EU and its neighbouring countries – with all rights (full market access) and obligations (acceptance of the entire EU aviation acquis). Secondly, comprehensive agreements with key partners⁸ – strategically important third countries – which are based on the pillars of market access liberalisation and regulatory convergence.

An analysis of statistical trends following the conclusions of EU-level air transport agreements (Chart 1 below) shows growth regard the development of passenger numbers, generally more direct city pairs and more carriers competing in the market. In particular, passenger numbers between the EU and the Western Balkans almost tripled, between the EU and Morocco more than doubled and increased by 52% with Moldova, by 27% with Georgia and by 15% with Israel since the conclusions of the respective agreements. Direct city pairs almost doubled between the EU and Morocco (+87%) and the Western Balkans (+100%) and increased by 54% with Israel and by 30% with Georgia. The number of operating carriers increased by 48% between the EU and Morocco, by 30% between the EU and Georgia, by 59% between the EU and the Western Balkans and by 17% between the EU and Israel.

³ Horizontal Agreements negotiated by the EU have the sole objective to bring the bilateral agreements of all EU Member States with one specific third country into line with EU law (for example the Horizontal Agreement between the EU and Malaysia brings the bilateral agreements between Malaysia and 22 EU Member States into line with EU law.). To this end, "national designation" clauses of the bilateral agreements are replaced by "EU designation" clauses. EU designation means that any EU airline established in a particular EU Member State is allowed to fly under the bilateral agreement of that EU Member State with a given third country. It is important to highlight that Horizontal Agreements do not affect the volume of air traffic rights or any other provision of the respective bilateral agreements of EU Member States with a third country.

⁴ Council conclusions on The EU's External Aviation Policy of the 3213th TTE Council meeting, 20 December 2012.

⁵ Report of the European Parliament on the EU's External Aviation Policy, A7-0172/2013 of 14 May 2013.

⁶ "The EU's External Aviation Policy - Addressing Future Challenges", COM(2012) 556 final.

⁷ Since 1999, such agreements have been concluded with Switzerland, the Western Balkan countries ("ECAA Agreement"), Morocco, Georgia, Jordan, Moldova and Israel.

⁸ Comprehensive agreements with other key partners have already been concluded with the US and Canada.

Comparative analysis of passenger traffic, direct citypairs and operating carriers since the signature of EU-level comprehensive aviation agreements

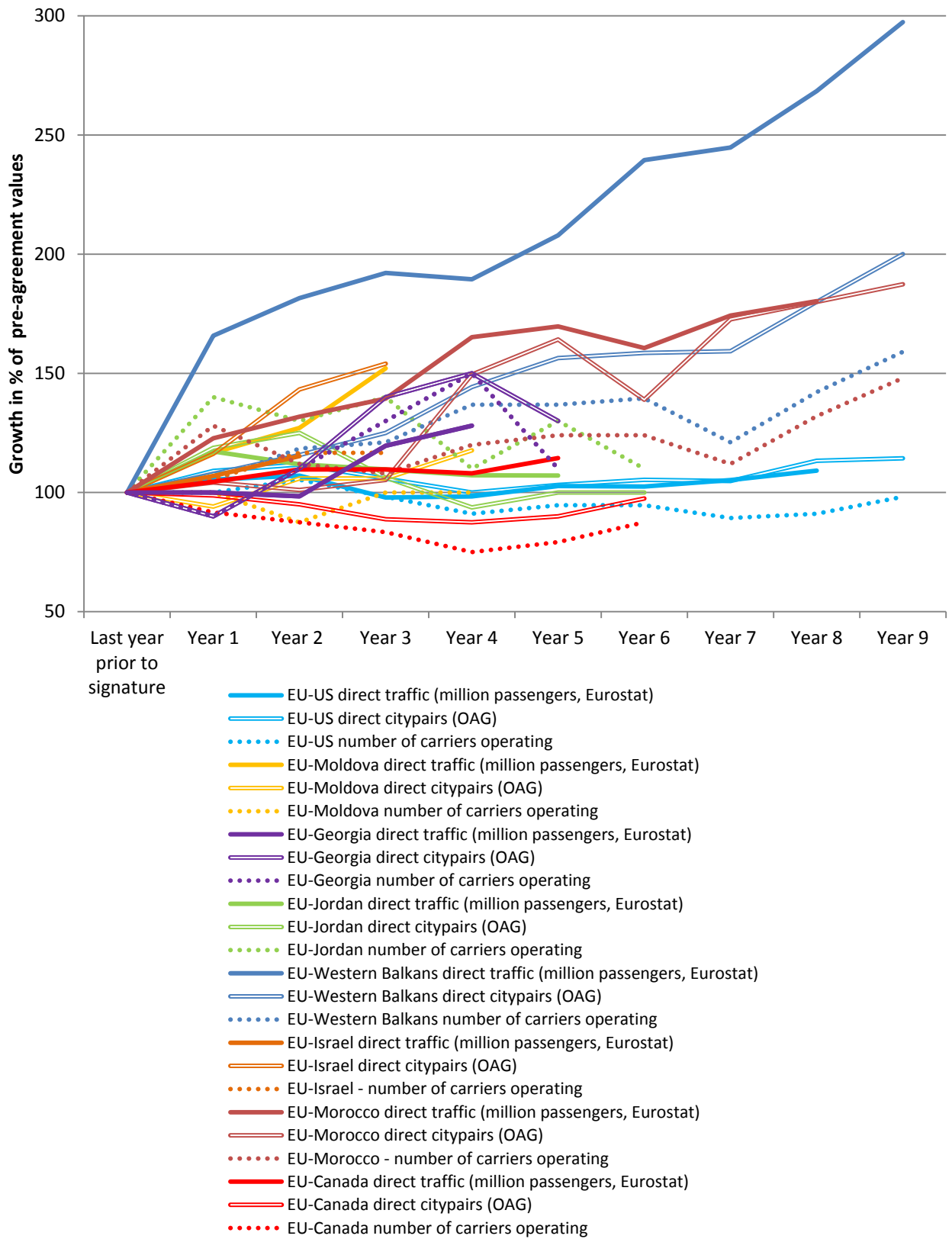


Chart 1 Trends after conclusion of EU level air transport agreements

Case study: The EU-US Aviation Agreement

The EU-US Air Transport Agreement was negotiated and signed in two stages in 2007 and 2010 and governs the world's largest intercontinental traffic flows and represents an important step towards the normalisation of the international aviation industry. The ultimate objective of the European Union is to create a transatlantic Open Aviation Area: a single air transport market between the EU and the US with free flows of investment and no restrictions on air services, including access to the domestic markets of both parties.

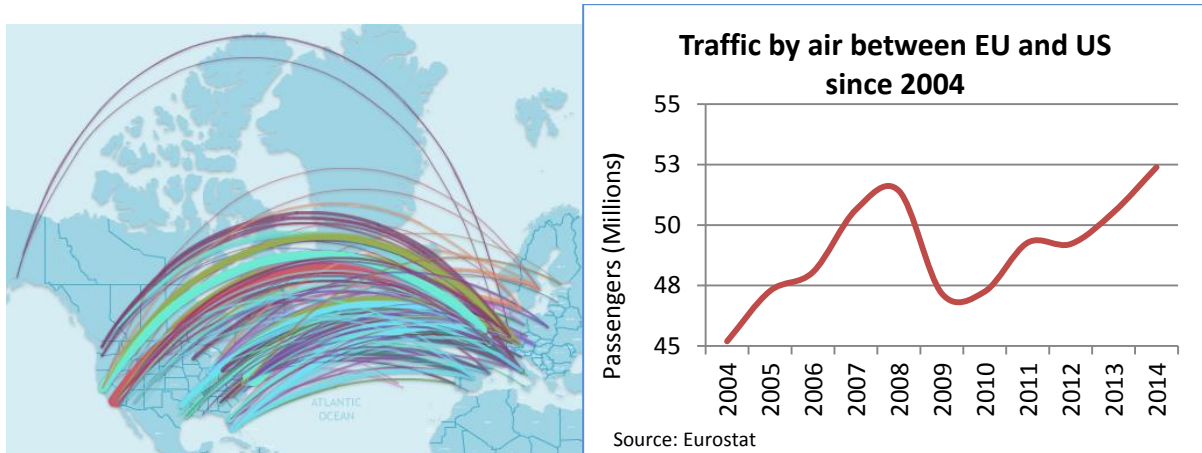


Chart 2 Traffic by air between EU and US

While the agreement does not go that far, it allows – for the first time – airlines to fly without restrictions from any point in the EU to any point in the US. The Agreement triggered a dramatic increase in services particularly in those parts of the transatlantic market that were previously subject to significant restrictions on operations arising from the pre-existing bilateral agreements: The number of individual city pairs increased by 30% and despite the reduced demand for air traffic in the aftermath of 9/11 and the financial crisis, the number of passengers increased to more than 52 million scheduled passengers in 2014 (+18% since 2004). A comparison with other key extra-EU markets shows that the US is by far the most important extra-EU market. For example, in July 2015, there were 4 million scheduled seats offered on EU-US flights, which is the combined number of seats offered to Switzerland and Turkey which are currently the second and third most important extra-EU markets.

The conclusion of Neighbourhood Agreements resulted in price decreases on flights to Morocco and Western Balkans of 40% in the first five years after signature and a combined economic benefit of 6 billion €.⁹

Case study: The EU-Morocco Aviation Agreement

In 2006, the EU and Morocco signed an aviation agreement which provides for the abolition of all restrictions on nationality, capacity, frequency or routes by European or Moroccan airlines between the two regions. It also provides for far reaching regulatory convergence in areas such as air traffic management, safety, security, environment, competition and consumer protection. The aviation market between Morocco and Europe was previously governed by restrictive bilateral air transport agreements, constraining the potential for growth. Average annual growth of passenger traffic during the period 1994-2005 was 2.3%. Between 2006 and 2014, the traffic went from 5.6 to almost 12 million annual passengers achieving a compound annual growth rate of more than 11% across the period.

⁹ Booz & Company: "Development of the EU's Future External Aviation Policy", Final Report, April 2012.

An independent study carried out for the European Commission¹⁰ has estimated the reduction in fares of around 40% between 2006 and 2011 which represents a consumer surplus gain of around €3,5bn. The EU-Morocco aviation agreement contributed to the creation of jobs, notably in the Moroccan tourism sector which in 2013 contributed to 1.8m jobs (direct, indirect and induced) and contributed with 19% (direct, indirect and induced) to the Moroccan GDP.¹¹ Morocco welcomed more than 10 million tourists in 2013 – most of which are from the EU.¹² This number grew by almost 60% since 2006 – also due to the development of air traffic since the conclusion of the Agreement in 2006.

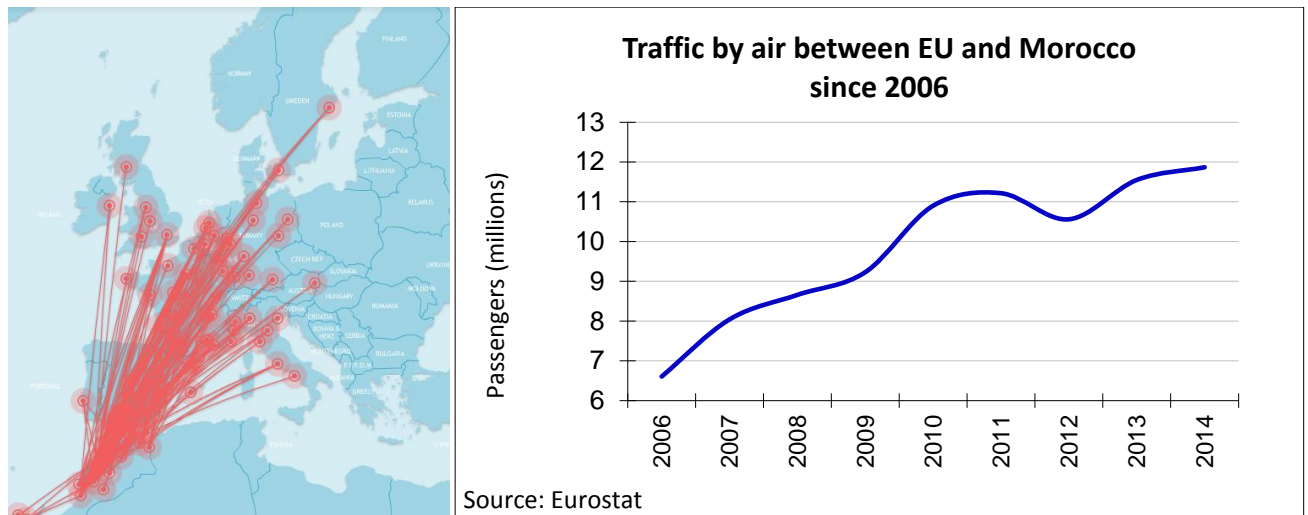


Chart 3 Evolution of number of passengers between EU-Morocco 2006-2014

Regulation 1008/2008: Regulation 1008/2008, the legal successor of the three legislative packages which established the EU single aviation market, is the basic regulation that organises the internal market. Regulation 1008/2008 establishes who can benefit from the internal market (EU licensed airlines), who delivers the airline licence and how, the articulation of the licence with the safety oversight of the airline, the EU ownership and control requirements of an airline in order to receive a licence, the exception to the freedom to operate (public service obligations, environmental and emergency measures, and traffic distribution within airport systems) or the commercial freedom of airlines to set price provided the respect price transparency provisions. It also contains provisions on code-sharing, as well as on wet and dry leasing.

Regulation 785/2004: Following the terrorist attacks in the United States on 11 September 2001, the European Commission has taken an interest in insurance requirements in the aviation industry. In the framework of the common transport policy, and in order to foster consumer protection and avoid distortion of competition between air carriers, Regulation (EC) No 785/2004 of the European Parliament and of the Council of 21 April 2004 on insurance requirements for air carriers and aircraft operators ensures a proper minimum level of insurance to cover liability of air carriers in respect of passengers, baggage, cargo and third parties. The Regulation applies to all air carriers and to all aircraft operators flying within, into, out of, or over the territory of a Member State. It requires both commercial air carriers and general aviation aircraft operators to be insured, in particular in respect of passengers, baggage, cargo and third parties, to cover the risks associated with aviation-specific liability

¹⁰ Booz & Company: "Development of the EU's Future External Aviation Policy", Final Report, April 2012.

¹¹ Oxford Economics for the World Travel & Tourism Council, <http://www.wttc.org/-/media/files/reports/economic%20impact%20research/country%20reports/morocco2014.pdf>.

¹² <http://www.wttc.org/-/media/files/reports/economic%20impact%20research/country%20reports/morocco2014.pdf>

Regulation 80/2009: It sets out a code of conduct for Computerised Reservation Systems (CRS) with the objective of offering consumers an unbiased choice of air fares under fair conditions. In evaluating whether the Regulation is achieving this objective during the Fitness Check carried out in 2013 the structure of the market in which CRS providers operate, a structure which is rapidly evolving and inherently complex was considered. The Fitness Check identified a number of areas where the Code could be marginally improved, albeit not necessarily in the immediate future. As providers other than the CRSs continue to develop products, which provide some, but not necessarily all the functionalities of a CRS, it is important to consider the correct scope of Regulation 80/2009 and whether its objective should be limited to ensuring an undistorted market for air travel distribution in market segments where only CRS providers might be considered to have a strong market presence, in particular business travel. In addition, future market developments may require ensuring an unbiased choice to the consumer across all available platforms, which may provide information on the available air travel services to customers. However, the relevant marketing and technological evolutions are still in progress, which renders adaptations to the legislative framework difficult at present.

Development of EU Aviation Safety Policy: Safety is at the centre of the EU's Aviation Policy. Statistically, flying is one of the safest means of transport and Europe has a strong safety record. However, aviation traffic in Europe is predicted to reach 14.4 million flights in 2035 (50% more than in 2012),¹³ which must be taken into account when measures are taken with a view to continuously maintain the safety of flying. Aviation safety policy not only gives confidence to EU citizens but contributes to the competitiveness of the EU aviation sector. A strong internal market, underpinned by an effective and efficient regulatory framework also opens up opportunities for businesses to expand successfully on the global market. The EU aviation safety policy is based on a comprehensive set of rules, now covering, after two extensions, all aspects of aviation safety such as manufacturing of aircraft, training of pilots or aircraft operations. Before that a European inter-governmental mechanism was in place that allowed for coordination between national authorities, but the rules resulting from this cooperation were neither uniform nor obligatory. In addition, the European Aviation Safety Agency (EASA) was established in 2002 as a specialised EU body for aviation safety. Since its creation, EASA's role has been to ensure a high uniform level of safety protection for EU citizens within the EU and worldwide, to ensure the high uniform level of environmental protection with respect to aeronautical products and to avoid duplication in the regulatory and certification processes among Member States. EASA also assists the Commission in the development of common aviation safety rules and monitoring the application of EU legislation in all Member States. Other main activity of this agency, of crucial importance to the EU aeronautical industry, is the type certification of aeronautical products – an activity which is funded not by taxpayer's money but entirely through the charges and fees paid by industry (the designers and manufacturers). A successful EU aviation safety policy is an important asset of the EU in international relations. Many of the countries around the world voluntarily apply EU requirements, which are perceived as representing state-of-the-art. This enhances global safety levels – also contributing to the safety of EU citizens travelling outside the EU – and has a catalytic impact on the competitiveness of the EU aeronautic manufacturing industry. The EU aviation safety policy, including through the conclusion of bilateral air safety agreements (BASAs), multilateral efforts in the context of ICAO, EASA certification activities, and technical cooperation projects facilitates the export of EU aeronautical products and services.

Development of EU Aviation Security Policy: Prior to 2001, aviation security was traditionally addressed at national level. Following the terrorist attacks in the United States on 11 September 2001 when commercial aircraft were used as weapons, causing numerous fatalities, the Commission made a legislative proposal to bring aviation security under the EU's regulatory umbrella. This initiative led to the adoption of a first framework

¹³ Eurocontrol, Challenges of Growth 2013, Task 4: European Air Traffic in 2035. This is the most likely out of four scenarios proposed by Eurocontrol that range from 11.2 to 17.3 million flights (19–83% growth compared to 2013).

regulation that provided the basis for allowing harmonisation of aviation security rules across the European Union with binding effect. That regulatory framework was subsequently overhauled by a new framework, in full effect from 29 April 2010, as laid down by Regulation (EC) No 300/2008 of the European Parliament and of the Council of 11 March 2008 on common rules in the field of civil aviation security and repealing Regulation (EC) No 2320/2002. On the basis of the security standards laid down by the ICAO, the EU has established a framework for common rules in aviation security that serves the economy and society by ensuring that air transport used by citizens and businesses is protected from acts of unlawful interference, such as terrorist acts or sabotage of aircraft. The EU framework has also set up a comprehensive oversight system for ensuring the implementation of EU rules. This requires the Commission to perform inspections to verify the implementation of EU rules, including through Member States' individual national aviation security programmes and national quality control programmes. Primary responsibility for oversight lies with the Member States which must also undertake audits and inspections.

A Single Sky for the Single Aviation Market: Air Traffic Management (ATM) provides the infrastructure for a safe and efficient flow of air traffic. Historically, ATM has always been developed at national level, but such fragmentation has led to inefficiencies which materialised with an exceptional level of congestion in the 1990s. As part of the EU's aviation policy, the Single European Sky (SES) legislation – an ambitious initiative to reform the architecture of European airspace to meet future safety, capacity, efficiency and environmental needs – entered into force in 2004. The Single European Sky aims at reorganising European airspace according to air traffic patterns, setting common technical and procedural rules and fostering the development of a harmonised European ATM system. Today, an EU performance scheme applies to Member States, with binding targets set in the areas of safety, environment, airspace capacity and cost efficiency. The scheme is now in its second reference period. The new organisation of airspace has started to reduce delays, costs and emissions and improve safety. The airspace has been organised in Functional Airspace Blocks (FAB); nine FABs, involving from two to six States, are expected to deliver more results gradually. The Network Manager for the ATM network functions has been designated in 2011, with major coordination responsibilities for the operational network performance in the areas of capacity and flight efficiency. Since 2011, the Network Manager has gone from being a concept on paper to a successful reality recognised by all stakeholders, bringing tangible benefits to the EU aviation network and adjacent States. Finally, arguably the most significant research programme on ATM, SESAR, has already started to show progress; its deployment phase, supported by the availability of €2.5 billion as EU co-financing for ATM-related projects for the period 2014-2020, should be the major driver in the development of the single European sky in the next decades.

The EU airport policy: Being the starting and ending point of any flight, airports are a vital part of aviation system. They are a key component of the Single European Sky and of the SESAR programme. They are also increasingly important to the European economy and cohesion. In 2015, Airport Council International Europe (ACI Europe) estimated the total economic impact of airports as 4.1% of the EU economy, when catalytic, induced, indirect and direct economic impacts are considered together¹⁴. The EU airport policy is made of three pieces of legislation governing respectively airport slots – defined as a permission given by a coordinator to use the full range of airport infrastructure necessary to operate an air service at a coordinated airport on a specific date and time for the purpose of landing or take-off; ground handling services – meaning a variety of services delivered at airports in support of the operation of air services; airport charges – paid by airlines for the use of the airport terminal and runway infrastructure necessary to operate a flight to or from an airport. Regarding slots, the continuous growth in air transport over the decades has increased pressure on the capacity available for aircraft movements at congested airports. There was thus a need for a regulation on airport slots. In 1993, the European Community adopted Council Regulation (EEC) 95/93 on common rules for the allocation of slots at

¹⁴ Intervistas: Economic Impact of European Airports. A critical catalyst to economic growth. Prepared for ACI Europe, 2015.

Community airports, based on the principles governing the system of slot allocation at global level (IATA Worldwide Scheduling Guidelines), in order to ensure the access of air carriers to congested airports of the Community on the basis of principles of neutrality, transparency and non-discrimination. The "use it or lose it" rule (an air carrier having operated its slots for at least 80% during the summer/winter scheduling period is entitled to the same slots in the equivalent scheduling period of the following year (so-called grandfather rights), otherwise the slots are lost) has been temporarily suspended following the events of 11 September 2001, on the occasion of the Iraq war and the SARS epidemic in 2003 and again in 2009 due to the intensity of the economic crisis and its impact on air carriers. In 2004, technical amendments to Regulation 95/93 were adopted, and in 2007 and 2008, the Commission adopted Communications on the application of the Slot Regulation. Further analysis carried out in 2010-2011 showed that the allocation system in place prevents optimal use of the scarce capacity at busy airports.¹⁵ Therefore, in 2011, the Commission proposed changes to the current Regulation mainly to allow for the introduction of market-based mechanisms across the EU provided that safeguards to ensure transparency or undistorted competition are established, including greater independence for slot coordinators. Regarding ground handling services, the market is covered by Directive 96/67/EC dating from October 1996 which gradually opened up the services to competition. This was necessary since the checking-in of passengers, baggage handling, the provision of catering services, etc. used to be a monopoly at many EU airports, and many airlines complained about the relatively high prices for the services provided and sub-optimal efficiency and service quality. According to various evaluations of the Directive by the Commission, the Directive has achieved its main objective of opening access to the ground handling market. But challenges remain, related to deficiencies in the current legal framework which prevent the ground handling market from providing consistently competitive services at all of the airports concerned.¹⁶ Finally, regarding airport charges, Directive 2009/12/EC lays down certain requirements on how airport charges are consulted upon by airports ("Airport Charges Directive"). It also outlaws discrimination in their application and obliges Member States to designate an independent authority to arbitrate in disputes between airports and airlines. These provisions can be regarded as minimum requirements; they do not say how airport charges are calculated, which is subject to different practices in the Member States. Charges for airport security are not addressed directly by EU legislation. The Directive applies at all airports handling more than 5 million passengers per year and at least to the largest airport in each Member State. This currently means around 70 airports in the EU, ranging in size from Ljubljana and Bratislava, each handling some 1.3 million passengers in 2014, to London Heathrow, with 73.4 million passengers in 2014.

Development of EU Air Passenger Rights Policy: The EU has adopted several regulations on air passenger rights designed at encouraging fair and consumer friendly commercial practices and to create a level-playing field for all airlines in the EU. One of the key measures is Regulation (EC) 261/2004 on air passengers' rights in case of denied boarding, long delays and cancellations which became applicable on 17 February 2005. The Regulation, as interpreted by ample jurisprudence by the Court of Justice of the European Union, sets a minimum level of quality standards for passenger protection, adding an important citizen's dimension to the liberalisation of the aviation market. Further, by virtue of Regulation (EC) 1107/2006 persons with disabilities or reduced mobility enjoy specific rights and protection at the airport and during air travel throughout the EU. Finally, by means of Regulation (EC) No 889/2002 amending Council Regulation (EC) 2027/97 on air carrier

¹⁵ Communication from the Commission Communication on the application of Regulation (EC) 793/2004 on common rules for the allocation of slots at Community airports, COM(2007) 0704 final; Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the application of Regulation (EEC) No 95/93 on common rules for the allocation of slots at Community airports, as amended, COM(2008) 0227 final.

¹⁶ Impact assessment accompanying the Proposal for a Regulation of the European Parliament and of the Council on groundhandling services at Union airports and repealing Council Directive 96/67/EC, SEC(2011) 1439 final, page 10, point 16: http://eur-lex.europa.eu/resource.html?uri=cellar:6c4173b0-0728-4df9-a463-c84f975df568.0001.02/DOC_1&format=PDF.

liability in the event of accidents, the EU aligned its legislation with regard to the liability of a Community air carrier in respect of passengers and their baggage with the provisions of the Montreal Convention to which it is one of the ratifying parties and extended the rules of the Montreal Convention to air services within one Member State. On 13 March 2013, the Commission proposed a revision of Regulation (EC) 261/2004 to ensure that air passengers have new and better rights to information, care and re-routing when they are stranded at an airport. At the same time there would be better complaint handling procedures and enforcement measures for passengers to obtain the rights to which they are entitled. The proposed amendment will ensure a fair balance between passenger and air carrier interests as well as compliance with general principles of EU law as interpreted by the Court of Justice of the European Union.

2. The impact of EU Aviation Policy

Expansion of the airline industry and development of the low cost sector: Global passenger traffic (annual passengers transported) increased from around one billion passengers in 1990 to more than three billion passengers today.¹⁷ Since 1970, global air traffic has doubled every 15 years, a trend which is expected to continue.¹⁸ Passenger numbers carried by EU airlines have seen constant growth rates since 1970 albeit not as steep compared with overall global numbers.

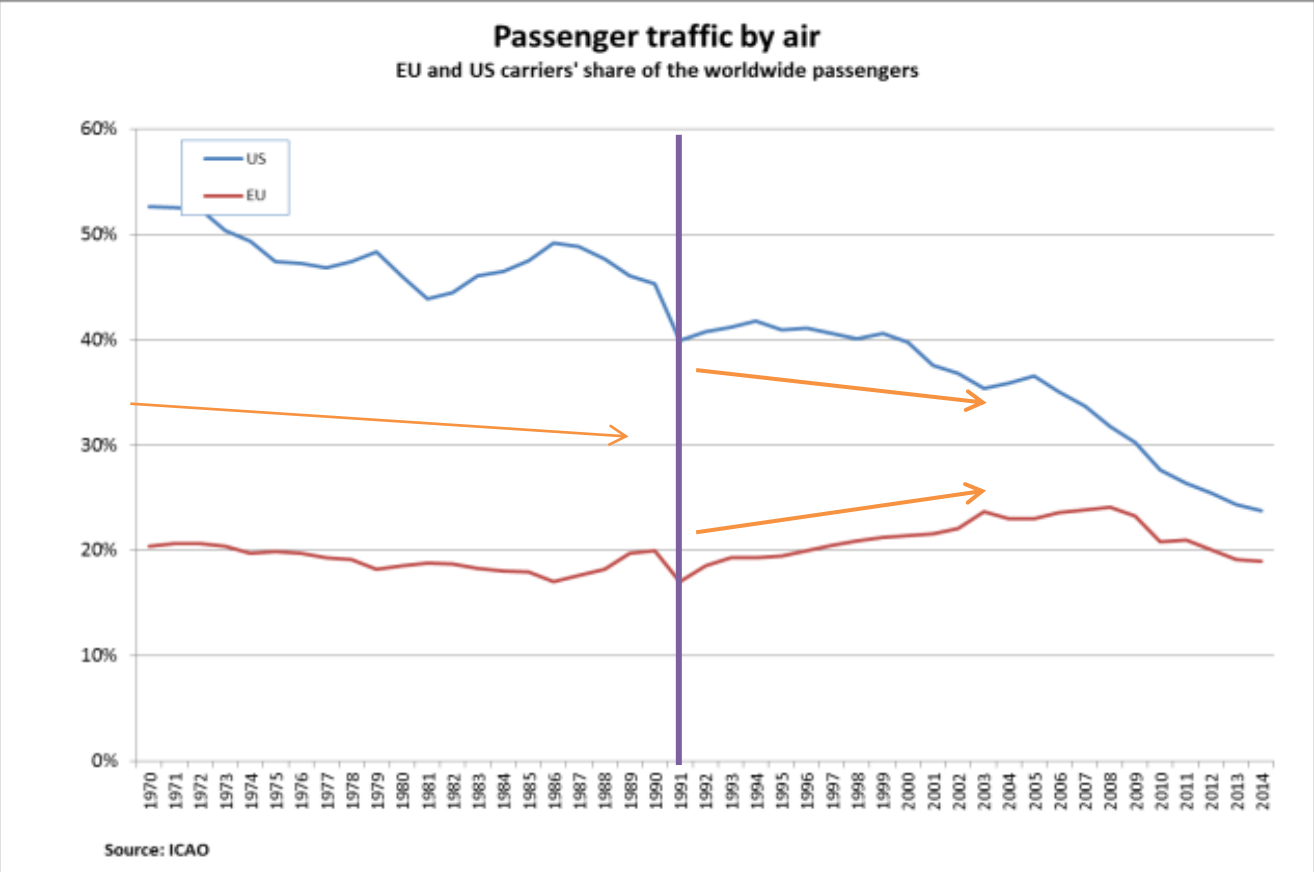


Chart 4 Passenger traffic by air, EU-US market share vs worldwide 1970-2014

A comparison with the US market, a comparatively mature market, however shows that the share of global passengers transported by US and EU airlines respectively has developed in parallel until 1990 (indicated by the purple line in Chart 4). From the beginning of the liberalisation of the EU Aviation Market, EU airlines could

¹⁷ ICAO.
¹⁸ ICAO; Airbus Global Market Forecast 2015-2034, p.8.

first expand and then maintain their market share and thereby close the gap with US carriers.¹⁹ This development can be explained with the creation of the EU single aviation market which liberalised intra-EU market access for EU airlines. As such it normalised air transport in the sense that it provided opportunities to EU industry which were comparable to US industry with the existing domestic US aviation market. This alleviation of commercial restrictions on EU feeder traffic, as a consequence, allowed EU network airlines to expand and intensify their "hub-and-spoke networks", which led to more passengers for EU airlines and a larger share for EU industry compared to the US.²⁰

The number of scheduled weekly seats available within the EU has increased from 5.5 million in 1992 to 13.9 million in 2015 (+152%). Growth rates for the different types of airlines (network carriers, charter and low cost carriers) were similar from 1992-2001. Virtually non-existent until 1995, and with a share of below 10% of weekly scheduled seats prior to 2002, the low cost sector outperformed and by 2012 left behind the network carriers' sector. In 2015, LCC accounted for 48% of seat capacity while network carriers provided less weekly seats than in 1998.²¹

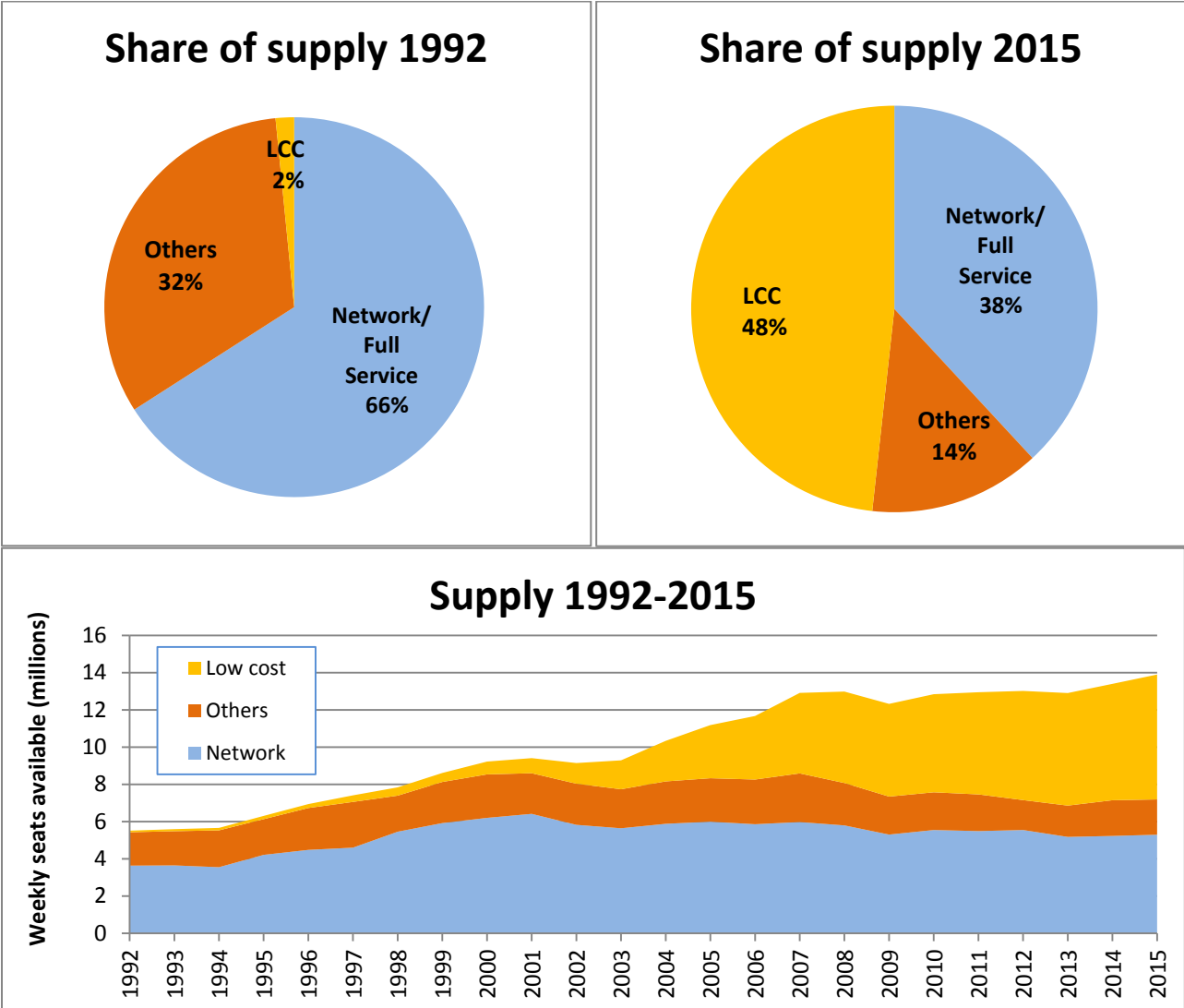


Chart 5 Evolution of supply of scheduled seats 1992-2015

¹⁹ ICAO, DG MOVE Analysis.
²⁰ G. Burghouwt, *et. al.* – Discussion Paper 2015-04 – OECD/ITF 2015, p. 12-13.
²¹ OAG summer schedules.

More routes: Liberalisation has sparked the number of intra-EU routes between EU Member States which increased from 874 in 1992 to 3,522 in 2015(+303%, 6.2% average growth p.a.). The number of extra-EU routes increased from 988 in 1992 to 2,621 in 2015 (+165%, 4.3% average growth p.a.). Growth rates for intra-EU routes and extra-EU routes have been similar from 1992-2001, whereas growth of extra-EU routes was stronger from 2001 to 2014. Growth of domestic routes of EU Member States was comparatively flat (from 818 in 1992 to 939 in 2015), plateauing at 1,037 routes in 2010. While the number of intra-EU routes, extra-EU routes and domestic routes all increased in absolute terms, during the process of fully liberalising the market for air transport services, the share of intra-EU routes increased strongly, the share of extra-EU routes remained stable while the share of domestic traffic declined.²²

Studies show that low-cost carriers made more use of the liberalisation of 5th/7th freedom and "Cabotage" rights within the EU²³, which are indicated in turquoise and green in the chart below. The route network of network airlines on the other hand is still dominated by 3rd/4th freedom traffic (direct, cross-Member State intra-EU traffic) and domestic traffic provided by an airline licensed in the respective Member State. The low-cost business model focusing on point-point routes, mostly short-haul, is less complex than the hub-and-spoke networks of network airlines, which operate one or more hubs and combine feeder traffic with long-haul routes.²⁴ This tendency can further be explained by the historical development of air transport services being operated by "flag carriers", traditionally rooted in a home market which is often reflected in an airline's name ("Swiss", "Air China", "Saudia", "Air Canada", "British Airways" etc.). Despite consolidation of the EU air transport market, for instance mergers between Air France and KLM or British Airways and Iberia, airlines continue to operate under their historical brands and with a separate licence, also because of external traffic rights linked to it. In the absence of full acceptance of EU designation by third countries, the regulatory obstacles for pan-European operations are therefore higher for those of the network airlines that operate intercontinental services dependant on bilateral traffic rights or on the acceptance of EU designation. Low cost carriers on the other hand currently focus on intra-EU services or on countries which are covered by EU-level comprehensive aviation agreements that facilitate pan-European operations (e.g. already operated trans-Atlantic services of Norwegian Air Shuttle).

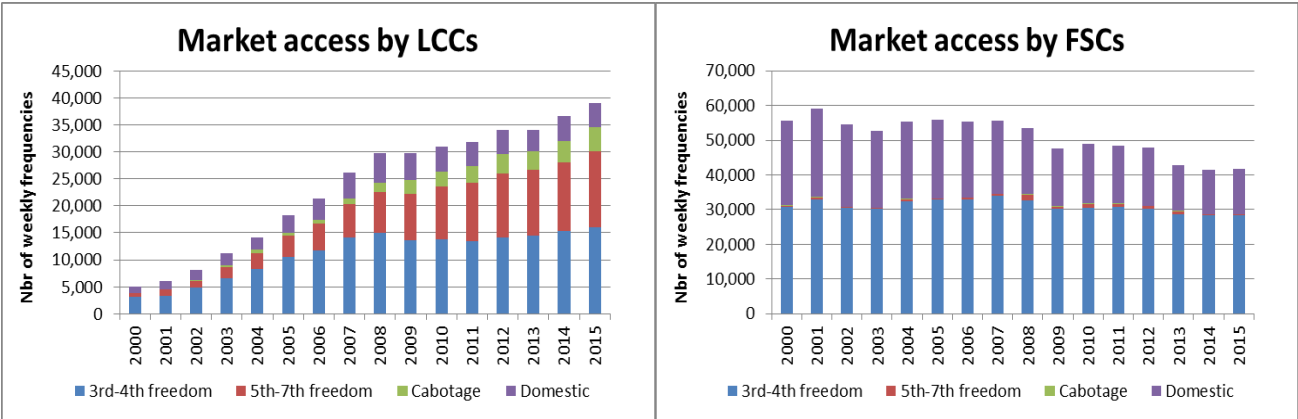


Chart 6 Segmentation of flights by type of business model

²² OAG summer schedules.

²³ Example for 5th freedom service: a service of an airline licenced in Portugal from Lisbon via Madrid to Paris; example for a 7th freedom service: a service from the same airline from Lisbon via Madrid to Barcelona; example for cabotage service: a service from the same airline from Madrid to Barcelona **without** connection back to Portugal (domestic service); see Annex 1.

²⁴ G. Burghouwt, *et. al.* – Discussion Paper 2015-04 – OECD/ITF 2015, p. 18.

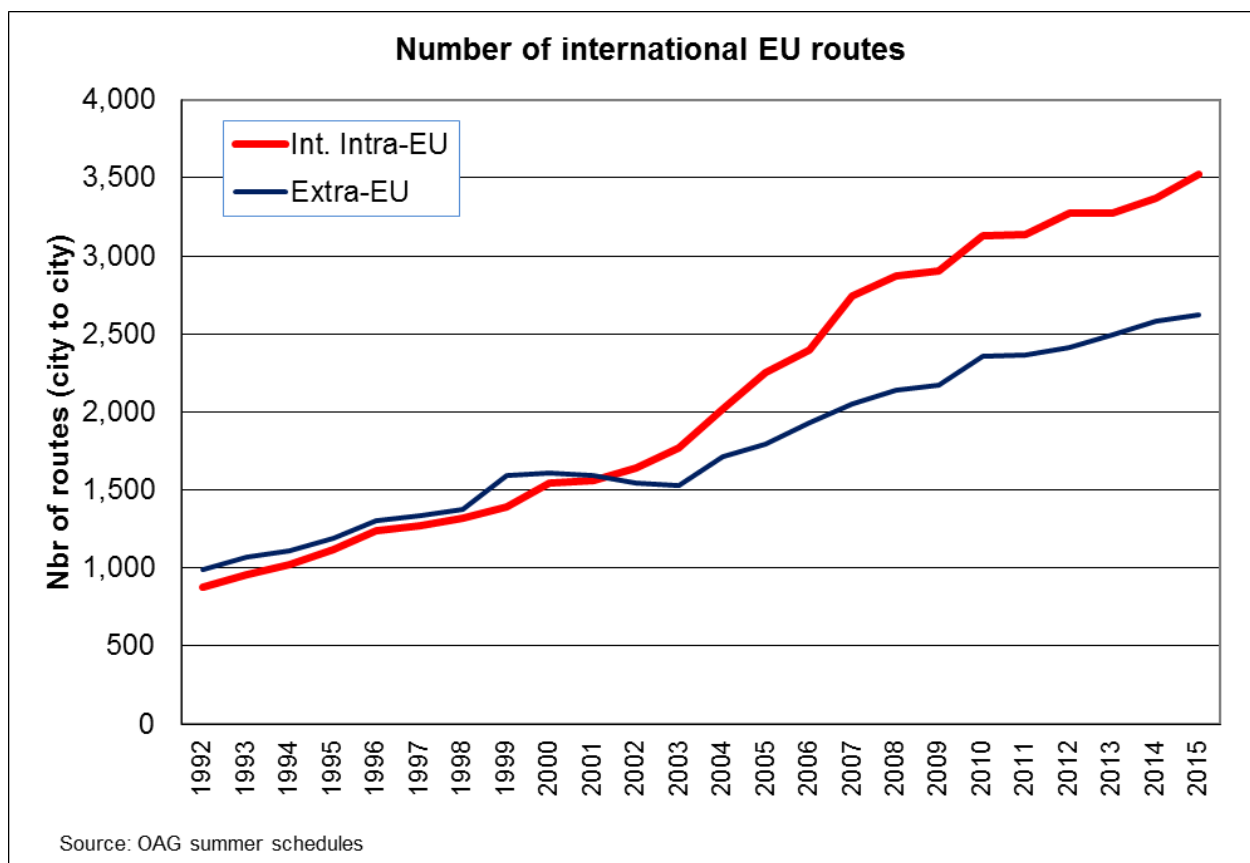


Chart 7 Number of intra-EU vs. extra-EU routes

More competition between airlines: The increase of intra-EU routes was accompanied by a strong shift towards more competition on these routes: The number of intra-EU routes served by more than two carriers increased from 93 in 1992 to 599 in 2015 (up by more than 540%) and the number of extra-EU routes with more than two carriers increased from 77 in 1992 to 308 in 2015 (up by 300%).²⁵

Overall contribution to jobs and growth: The EU aviation sector directly employs between 1.4²⁶ and 2²⁷ million people.²⁸ Aviation has considerable multiplier effects which increase the overall contribution to jobs and growth: In total, the sector supports 4.7²⁹ to 5.5³⁰ million jobs (including indirect and induced impacts) and if we include catalytic impacts – for instance tourism or the contribution the attractiveness of the EU as a business location – the overall contribution could rise to 9.3 million jobs according to ATAG. The direct contribution to the EU's GDP is €110bn which increases to €300bn taking into account indirect and induced impacts.³¹ The multiplier effects of aviation have been estimated through various econometric models: A 10% increase of connectivity/seat capacity stimulates the GDP (per capita) by an additional 0.5%, the GDP growth rate by 1%

²⁵ OAG summer schedules.

²⁶ Steer Davies Gleave 2015 – Study on employment and working conditions in air transport and airports, commissioned by the European Commission.

²⁷ ATAG, Aviation benefits beyond borders 2014

²⁸ Steer Davies Gleave 2015 – Study on employment and working conditions in air transport and airports, commissioned by the European Commission. A second set of figures exist from ATAG (Around 2 million direct jobs, 5.5 million direct or indirect jobs, including induced and catalytic jobs [for instance tourism] as high at 9.3 million jobs; ATAG, Aviation benefits beyond borders 2014).

²⁹ Steer Davies Gleave 2015.

³⁰ ATAG.

³¹ Steer Davies Gleave 2015 – Study on employment and working conditions in air transport and airports; a second set of figures exist from ATAG (direct contribution to GDP of €121bn and total impact as large as €512 bn, ATAG, Aviation benefits beyond borders 2014).

and leads to an overall increase of labour productivity.³² The availability of direct intercontinental flights is effectively a major determinant in the location choices of large firms' headquarters: A 10% increase in the supply of intercontinental flights involves around a 4% increase in the number of headquarters of large firms.³³ A 10% increase of departing passengers in a metropolitan region increases the employment in the services sector of that metropolitan region by 1%.³⁴ A recent study found that one Euro value added in the air transport industry creates a value of almost three Euro value added for the overall economy. One job in the air transport industry added creates more than three jobs in other sectors. The sectors which are benefitting most from those indirect and induced impacts are other transport services/warehousing, rental and leasing activities, retail, construction, wholesale, provision of personnel, accommodation and gastronomy, financial services³⁵. A survey among German companies, from SMEs to multinationals, confirms that air transport is very important or important for 56% of the total companies and for 74% of industry – in particular for mechanical engineering, the automotive and chemical industries.³⁶

Since the creation of the single aviation market, employment figures in the air transport sector have remained stable with a strong growth in labour productivity.³⁷

Compared to other sectors the aviation sector is characterised by being composed by a smaller number of large enterprises and by a geographic concentration of the economic activity (Germany, France, UK for both air transport services and aerospace manufacturing). The apparent labour productivity of the sector is higher than the EU non-financial business economy average of €44.800 per capita (€75.300 for air transport services and €80.400 for aerospace manufacturing).³⁸

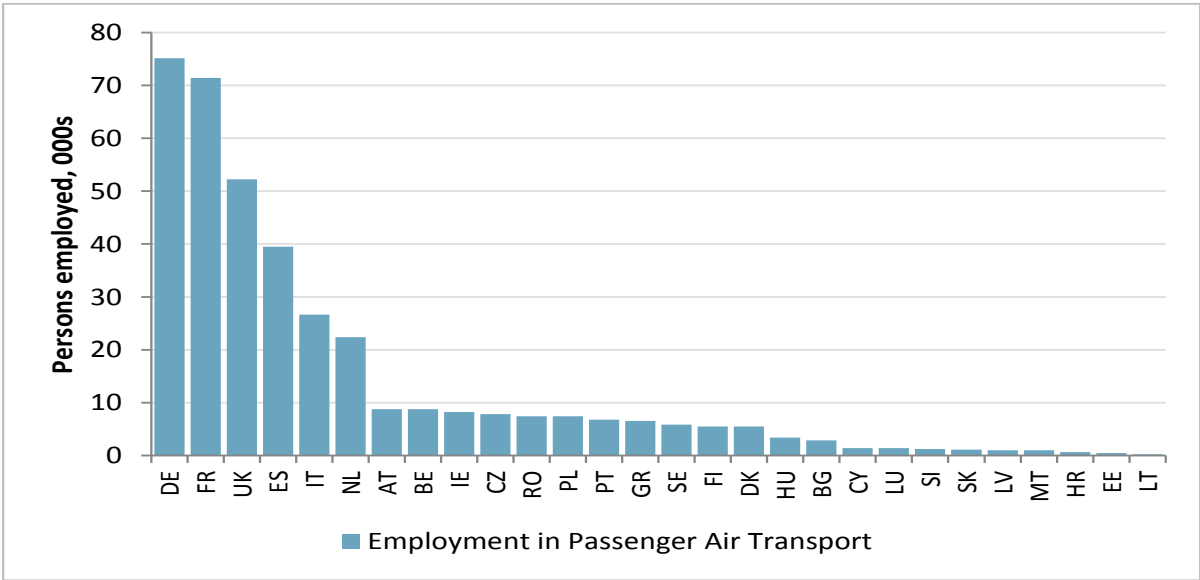


Chart 8 Direct passenger air transport employment (persons employed, NACE 51.1) by Member State, 2013

³² InterVISTAS, 2015, Economic Impact of European Airports – A Critical Catalyst to Economic Growth; PwC, 2013, Econometric analysis to develop evidence on the links between aviation and the economy; IATA, 2007, Aviation Economic Benefits - Measuring the economic rate of return on investment in the aviation industry.

³³ Getting there fast: globalization, intercontinental flights and location of headquarters - Journal of Economic Geography 8 (2008) pp. 471–495.

³⁴ Brueckner, 2002, Airline Traffic and Urban Economic Development.

³⁵ IWI, Die volkswirtschaftliche Bedeutung der österreichischen Luftverkehrswirtschaft, 2015

³⁶ BDL, Report 2013 – Luftfahrt und Wirtschaft.

³⁷ Steer Davies Gleave 2015 – Study on employment and working conditions in air transport and airports: If calculated on the basis of EU airline passengers per person employed, there was a 43% increase of productivity between 2000 and 2013, or 4.3% per year, if calculated on the basis of persons employed per flight-kilometre, there was a 15% increase of productivity, or if productivity growth was measured in terms of airline and ground-handling employees per flight-kilometre, it would be approximately 12%.

³⁸ Eurostat, NACE (2010), http://ec.europa.eu/eurostat/statistics-explained/index.php/Air_transport_services_statistics_-_NACE_Rev._2#Further_Eurostat_information, http://ec.europa.eu/eurostat/statistics-explained/index.php/Manufacture_of_other_transport_equipment_statistics_-_NACE_Rev._2.

3. The competitiveness of the different parts of the aviation value network

With just 7% of the world's population, the EU's trade with the rest of the world accounts for around 20% of global trade and 25% of global air traffic (2013 RPKs³⁹).⁴⁰

Profitability gap between different parts of the aviation value network: All parts of the aviation value network which is to be understood in a holistic way comprising all parts of the aviation sector (airlines, airports, manufacturing, auxiliary industry, ANSPs just to name a few), are interdependent and interlinked. This symbiotic nature becomes most evident when parts of the value network fail. For instance, industrial action at different elements of the aviation value network (air traffic controllers, pilots, cabin crews) impacts all airspace users across Europe⁴¹. Cost related to ground handling account for 15%, to route charges of Air Navigation Service Providers (ANSP) for 6% and to airport charges for 4% of the operating cost of AEA airlines.⁴² Yet, the profitability of airlines, airports, manufacturing industry, ANSPs and other parts of the aviation value network is starkly differing. For instance, there is a profitability gap of 19 percentage points between globally leading airport groups and airline groups: In 2013, operating margins of top 100 airport groups were on average 23% compared to 4% for top 150 airlines. Differences regarding the regulatory environments do exist between the different parts of the aviation value network – with airlines being the most constrained in terms of market access, access to investment and in general the possibility to consolidate on a global level.

3.1 Competitiveness of EU airlines in the global context

IATA forecasts that 1% of global GDP expenditure will be spent on air transport in 2015. The global number of passenger departures (+6.5%), revenue passenger kilometres (+6.7%) and freight tonnes (+5.3%) are all expected to grow compared to 2014 and continue in line with the overall trend. As such the growth rates of air transport are higher than the growth rates of the world GDP (+2.6% in 2014, +2.9% forecast for 2015) and world trade (+3.0% in 2014, +3.7% forecast for 2015). The average net profit margin of the global airline industry increased from 1.5% in 2013 to 2.2% in 2014 and is forecasted to be 4.0% in 2015.⁴³

An analysis of the current fleet size, composition and orders of major global airlines shows that the big North American airlines have the largest overall fleets in service.

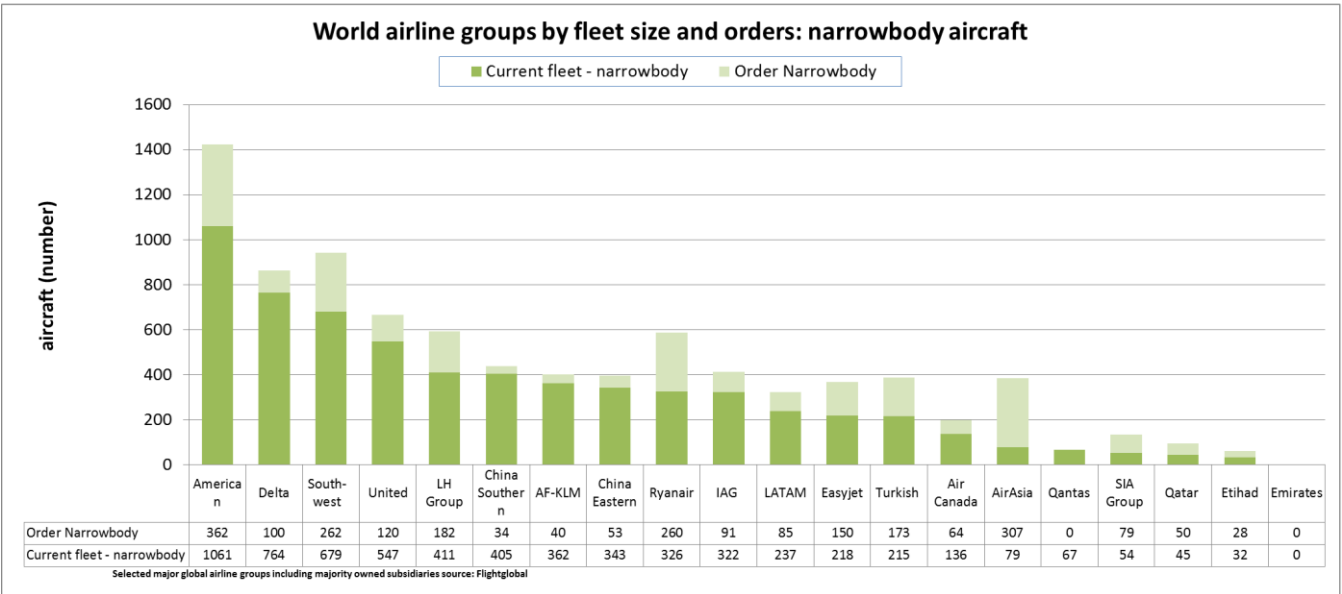
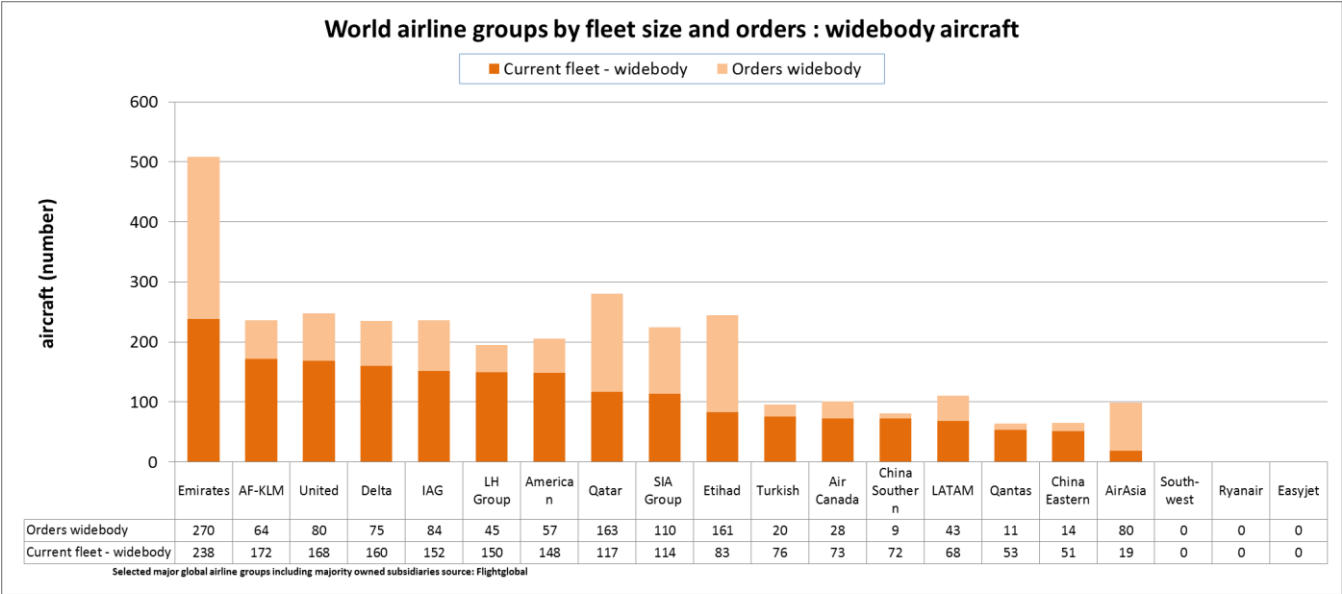
³⁹ A RPK is flown when a revenue passenger (a passenger who pays for transportation) is carried one kilometre.

⁴⁰ Eurostat, Airbus Global Market Forecast, p. 35.

⁴¹ As an example, industrial action in January, March, May, June, September, October and December 2014 caused more than 730,000 minutes of delay and thousands of cancelled flights with the linked impact on the European and global air transport networks and traffic flows. Eurocontrol, PPR 2014 - Performance Review Report, p. 1

⁴² Eurocontrol, PPR 2014 - Performance Review Report, p. 17 referring to the AEA 2013 breakdown of operating expenses: 24% fuel, 15% station and ground, 10% maintenance and overhaul, 9% ticketing, sales and promotion, 8% flight deck crew, 7% rentals, 6% navigation charges, 5% cabin attendants, 4% each airport charges, passenger service, general & administration and depreciation. Depending on the airline business model, the final share of each cost factor can vary.

⁴³ IATA, Airline Industry Economic Performance - Mid-year June 2015.



Charts 9 World airlines by fleet size and orders

Segmented according to widebody and narrowbody aircraft, it shows that the currently largest existing widebody fleets are with Emirates, AF-KLM and United with the largest orders of widebody aircraft placed for Emirates, Qatar Airways, Etihad and Singapore Airlines.

The largest narrow-body fleets are with large US airlines and the largest orders have been placed by American Airlines, AirAsia, Southwest Airlines and Ryanair.

Total orders exceeding airlines' current fleet size can be observed in the cases of Emirates, Singapore Airlines, Qatar Airways, Etihad and AirAsia.

Globally, North American airlines are leading with net profit margins of 3.5% in 2013 and 5.2% in 2014 with no other region exceeding a net profit margin of 2% in 2014. The European airline industry, including also companies based in Russia, Turkey, Switzerland or Norway, reported an average net profit margin of 0.5% in 2013 and 1.6% in 2014, falling short of the global average margins in both years. European airlines' also reported a high breakeven load factor of 64.7% (2014), higher than North America (58.1%), Middle East

(59.1%), Latin America (60.1%) or Africa (56.0%) and second only to Asia-Pacific (65.2%). For 2015, IATA forecasts the highest breakeven load factor for European airlines, which means that European airlines need to fill more of the plane in order to breakeven.⁴⁴

Indeed when ranked by RPK as a measure of sales volume of passenger traffic, one can observe the rapid rise of emerging competitors to EU airlines. In terms of RPKs, a comparison of 2007 and 2014 data shows that leading EU airlines have been, or are increasingly left behind fast-growing competitors such as Emirates, Southwest and China Southern while China Eastern Airlines, Air China and Turkish Airlines are growing considerably faster. Ryanair and Easyjet are the leading EU companies which show the strongest growth rates.⁴⁵ In comparison with the three large US legacy airlines, the largest EU airlines had a similar or even better performance in terms of RPKs over the period.

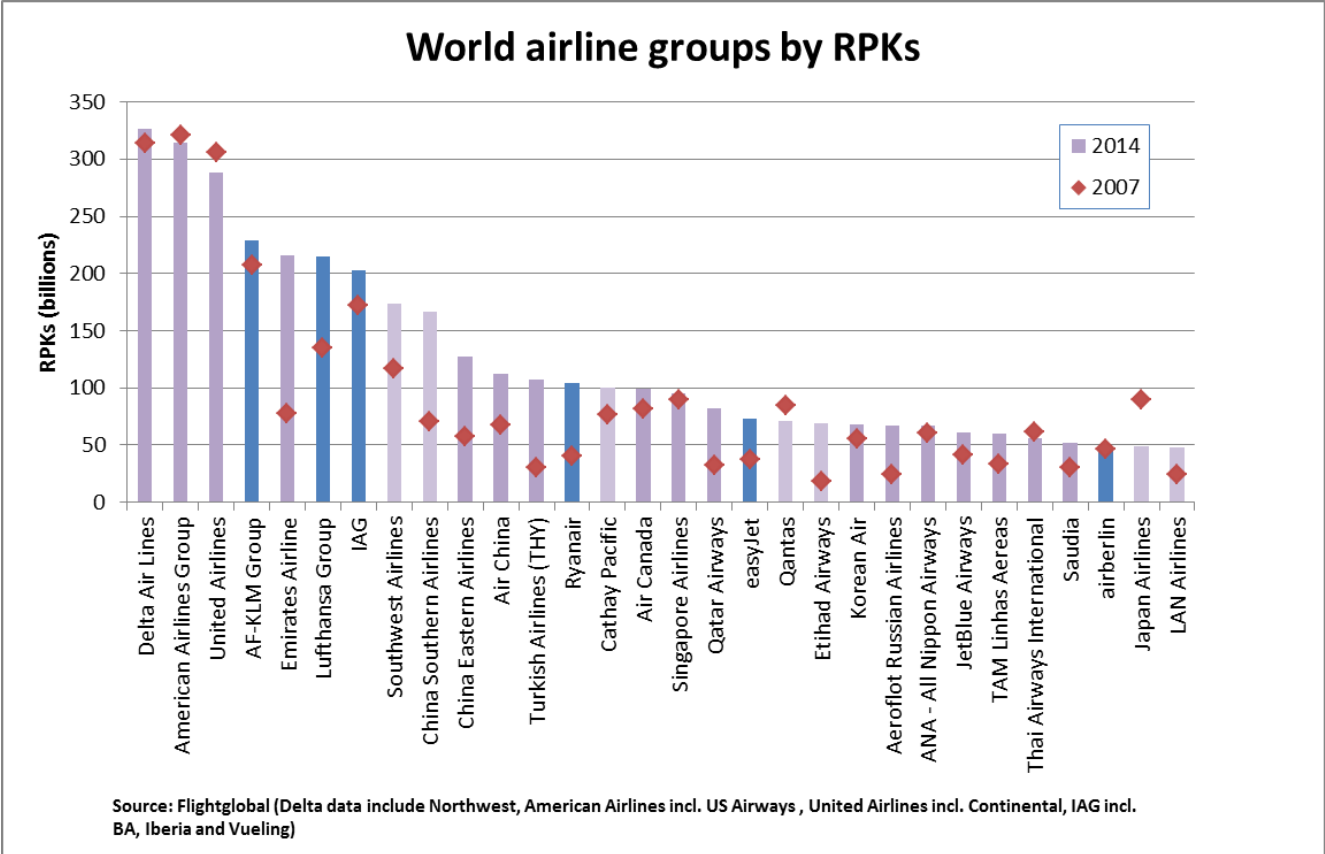


Chart 10 World airlines by RPKs

In total, in 2014 there were 32 EU airlines among the leading 150 airline groups by revenue (comprising passenger, leisure and cargo airlines), 30% less than in 2001 and 20% less than 2008. During that period of time, EU airlines fell behind their global competitors in terms of net profit and post an average net loss while the non-EU top 150 airlines are on average profitable. The EU Member State with most airline groups ranked (2014) is the UK (8), followed by Germany and France (3 each), Italy, Ireland, Luxembourg, Spain and Sweden (2 each), and Portugal, Denmark, Finland, Belgium, Greece, Hungary, Czech Republic and Poland (1 each).

⁴⁴ IATA, Airline Industry Economic Performance - Mid-year June 2015.

⁴⁵ MOVE analysis of Flightglobal data.

Table 1 Overview of the global performance of leading EU airlines since 2001⁴⁶

Year	Number of EU airlines among top 150	Number of EU airlines among top 50	Number of EU airlines among top 25	Number of EU airlines among top 10	Number of EU airlines among top 5	Average net profit margin of EU airlines among top 150	Average net profit margin of non-EU airlines among top 150
2001	46	30	7	3	1	-3.1%	-4.6%
2008	41	24	5	3	2	-2%	-7.2%
2013	32	23	4	3	2	-0.4%	2.7%

In 2001, 2008 and 2014, there were three EU airline groups among the 10 largest airlines ranked by revenues: In 2014, the Lufthansa Group ranked 3rd, Air France-KLM Group 5th and International Airlines Group (IAG) 7th. IAG is the only EU network airline which ranks among the top 10 highest group net profits, whereas Ryanair and Easyjet – both low cost airlines – came 5th and 6th.⁴⁷ Current net profit margins of these leading EU airline groups are between -0.8% (Air France) and 15.3% (Ryanair), with Lufthansa reporting a margin of 0.2%, IAG reporting a margin of 5.0% and Easyjet of 9.9%.⁴⁸

Table 2 Overview of financial performance of key EU airline groups in 2014 (in EUR, y-o-y)

Airline group	Revenue	PAX revenue	Cargo revenue	Other revenue	Revenue growth	Operating margin	Net margin	Employment by the airline
LHG	30bn	21.6bn	2.8bn	5.6bn	-0.1%	3.2%	0.2%	119,000
AFKLM	24.9bn	19.6bn	2.7bn	2.7bn	-2.4%	-0.5%	-0.8%	95,000
IAG	23.6bn	20.8bn	1.2bn	1.6bn	7.7%	5.1%	5.0%	60,000
Ryanair	5.7bn	4.3bn	-	1.4bn	12.3%	18.4%	15.3%	10,000
Easyjet	6.7bn	6.6bn	-	0.1bn	13.1%	12.8%	9.9%	9,000
Small/midsize network airlines	26bn	-	-	-	-	-	-4%	65,500

As depicted in Table 2, among these leading EU airlines, the Lufthansa Group, including all activities, directly employs 119,000 staff (90,400 of which are based in the EU), the Air France-KLM Group 95,000 staff (92,000 of which are in the EU) and IAG 60,000 staff. Ryanair directly employs 10,000 and Easyjet 9,000 staff. The largest contribution in terms of direct employment in the EU air transport sector is by far made by the large international network carrier groups.⁴⁹

Small and mid-sized EU network airlines which serve smaller hubs and mainly European networks with mostly selected long-haul services, report in average a loss of 4% in 2014. The direct employment is around 65,000 and as such 4 times less compared to the big international network airlines but more than 3 times higher compared to the leading low cost airlines.

All network airlines typically carry belly hold cargo on regular flights. Additionally, some airline groups have dedicated divisions or subsidiaries operating a freighter fleet and some airlines focus solely on cargo or express delivery services. In 2013, 18 EU airlines were among the top 100 cargo airlines and three among the top 10 ranked by cargo traffic. In terms of cargo revenue, 3 EU airlines ranked among the top 10 – dwarfed by FedEx

⁴⁶ Flightglobal World Airport Ranking 2001.

⁴⁷ Flightglobal World Airline Ranking 2014, ATW World Airline Report 2014.

⁴⁸ DG MOVE Analysis of most recent Annual Financial Statements.

⁴⁹ DG MOVE Analysis of Annual Reports.

which created as much revenue as its closest 9 competitors combined.⁵⁰ Because of the diversity of the cargo business, operated by regular airlines as business divisions or by local subsidiaries of multinational companies along with a few dedicated cargo airlines and the diverging financial reporting standards, profitability in terms of net margins is difficult to compare.

In terms of RPKs of the combined top 50 airlines, those airlines focusing on holiday and charter services represent less than 7% of the overall airline business. 27 EU leisure airlines rank among the top 50 global airlines in this segment and 7 out of the top 10 companies are EU based. Because of the integration of various leisure airlines into larger overall tourism industry, such as TUI or Thomas Cook with their various airline subsidiaries and the diverging financial reporting it is difficult to compare profitability in terms of net margins.

3.2 Competitiveness of EU airports in the global context

During 2013, the global airport industry remained largely unperturbed by economic uncertainties of risks and reported overall revenue growth rates of 5.5% compared to 2012. Latest available ACI figures highlight that the global airport industry net profit margin was 16% while the global return on invested capital (ROIC) was 6.3%. However, the profitability is driven by a comparatively smaller number of airports which account for the lion share of passenger and cargo traffic – indeed 93% of all loss-making airports have fewer than a million passengers.⁵¹ Europe remained the leading region in terms of global airport income but experienced the weakest growth in overall revenues at 2.3%.⁵² In terms of Return on Invested Capital (ROIC), EU airports recorded an average of 5.7% (lower for Eurozone airports – 5%) which was below the global average of 6.8%.⁵³

In terms of passenger numbers, 9 EU airports rank among the 40 top global airports in 2014, a figure unchanged since 2000. However, due to stronger growth of airports outside of the EU, EU airports fall behind emerging competitors in the ranking of the top 10 global airports: In 2001, London Heathrow (4th), Frankfurt (7th), Paris CDG (8th), and Amsterdam (9th) made it into the top 10, while in 2008 Frankfurt fell back and Amsterdam fell out (London Heathrow came 3rd, Paris CDG 7th and Frankfurt 9th) and in 2014 only London Heathrow (4th) and Paris CDG (9th) were still ranked among the top 10 airports worldwide. Over the same period, Dubai jumped from 75th (2001) to 12th (2008) and to 7th position in 2014 (+520%⁵⁴ / +38%⁵⁵ growth respectively), Istanbul from 67th, to 30th and to 14th (+ 393% / +51% respectively) and Incheon from 68th to 33rd and to 23rd (+316% / +29% respectively).⁵⁶

In terms of international passengers, which excludes purely domestic traffic and puts stronger emphasis on international connecting and long-haul traffic this trend is even more visible. EU key hub airports (indicated by the blue columns) which have traditionally had a strong position in this ranking are increasing falling behind non-EU hubs.

⁵⁰ Flightglobal Airline Business: Special Report Cargo.

⁵¹ ACI, <http://www.aci.aero/News/Releases/Most-Recent/2015/06/03/ACI-Releases-the-19th-edition-of-the-Airport-Economics-Report--Paradox-Overall-industry-is-in-the-black-yet-most-airports-lose-money>.

⁵² ACI, ACI Annual Report 2014, p. 19: Europe 38%, Asia-Pacific 28%.

⁵³ ACI Europe Economics Report 2014, p. 32.

⁵⁴ 2001-2014

⁵⁵ 2008-2014

⁵⁶ DG MOVE Analysis, ACI, Flightglobal Airport rankings 2001, 2008, 2014.

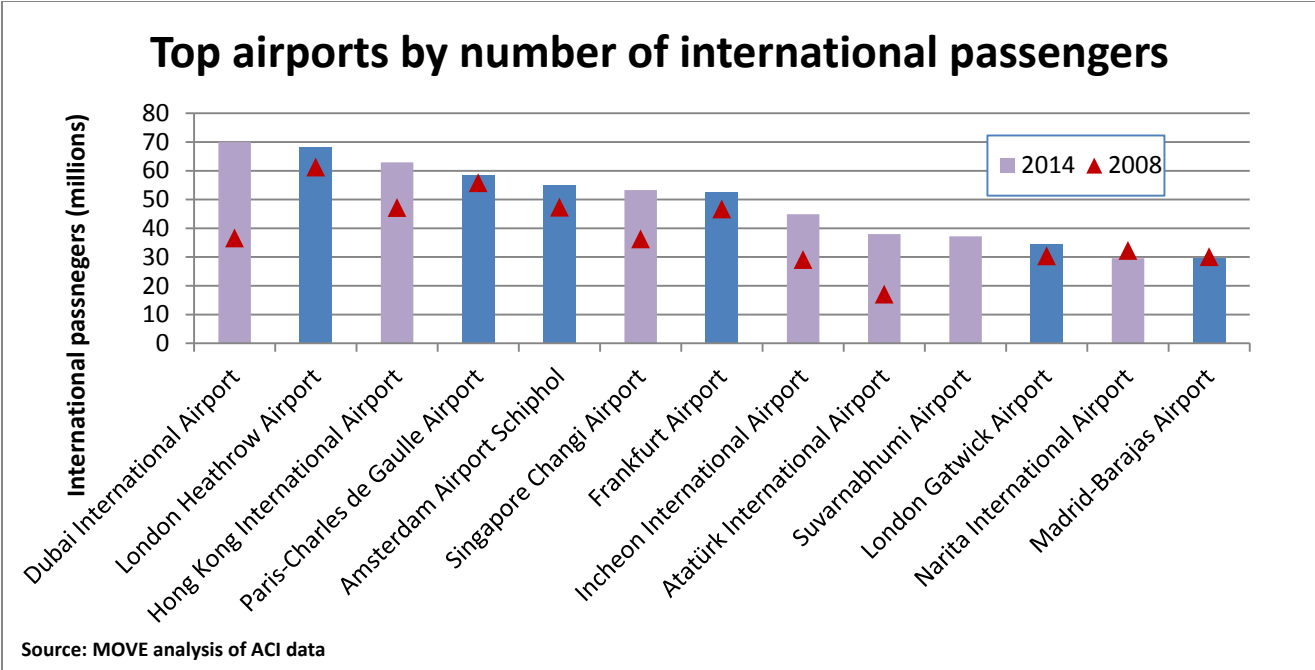


Chart 11 Top airports by number of international passengers

Airports typically generate aeronautical revenue (passenger charges, landing charges, terminal rentals, security charges etc.), which accounted globally for 65.8 billion USD in 2012, and in Europe for 26.1 billion USD) and non-aeronautical revenue (retail concessions, property income/rent, car parking, food and beverage etc.), which accounted globally for 51.2 billion USD in 2012 and in Europe for 18.2 billion USD).⁵⁷ Airport retailing in particular, the largest single component of non-aeronautical revenues, contributed around 15% of total airport revenues in Europe in 2011, growing from 11% in 2008. In absolute terms, revenues increased from €3.1 billion in 2008 to €4.1 billion in 2011.⁵⁸

The overall profitability of the global airport industry is created by 20% of airports whereas 67% of all airports, among them 80% of airports with fewer than one million passengers/year, are loss-making.⁵⁹ In the EU, 60% of all airports (2012: 62%) and 77% of airports with fewer than one million passengers/year were loss-making in 2014.⁶⁰

While in total 44% of Europe's airport reported losses, there were also 33 EU airport groups among the leading 100 airport groups by revenue in 2013 – a figure similar to 2008. Average net profit margins among those EU airports are around 10% and slightly behind the global peers. The EU Member State with most airport groups ranked is Germany (6), followed by the UK (5), France (3), Italy and Spain (2 both), and the Netherlands, Austria, Sweden, Ireland, Portugal, Denmark, Finland, Belgium, Greece, Hungary, Czech Republic and Poland (1 each).⁶¹

⁵⁷ ACI, 2013 (Distribution of Non-Aeronautical Income of European Airports by Source in 2012: retail concessions 34.2%, food and beverage 3.9%, car parking 14.4%, rental car concession 3.3%, property income or rent 22.5%, advertising 2.6%, other 19.0%).

⁵⁸ The European Travel Retail Confederation.

⁵⁹ ACI Annual Report 2014, p. 20.

⁶⁰ ACI, Key Data 2014.

⁶¹ ACI, Flightglobal Airline Business.

Table 3 Overview of financial performance of leading EU airports in 2014 (in EUR, y-o-y)⁶²

Year	Number of EU airports among top 100 (top 50 for 2001)	Number of EU airports among top 50	Number of EU airports among top 15	Number of EU airports among top 5	Average net profit margin of EU airports among top 100 (50 for 2001)	Average net profit margin of non-EU airports among top 100 (50 for 2001)
2001	17	17	8	4	8.7%	9.5%
2008	32	20	6	4	10.8%	10.8%
2013	33	17	6	4	10.9%	11.9%

In 2001, 2008 and 2013, 4 EU groups were leading the global ranking of the airports by revenue: London Heathrow (LHR), AENA, Aeroports de Paris (AdP) and Fraport. Additionally, the Schiphol Group (AMS) ranked 9th and Munich Airport (MUC) 11th in 2013.⁶³ Current net profit margins of these leading European airport groups are between 8.3% (Munich) and 20.8% (AENA). 39% of their combined revenue comes from non-aeronautical sources.⁶⁴

Table 4 Overview of financial performance of key EU hub airport groups in 2014 (in EUR, y-o-y)

Airport group	Revenue	Aeronautical revenue	Revenue growth	Operating margin	Net margin	Employment by the airport operator	Direct employment at the airport ⁶⁵
LHR (2013)	3.7bn	2.3bn	10%	38.7%	12.2%	8,000	62,000
AENA	2.9bn	2.3bn	14%	27.5%	20.8%	7,250	27,000 (MAD only)
AdP	2.8bn	1.6bn	7.5%	23.8%	14.4%	9,000	114,000
FRA	2.4bn	0.9bn	8.1%	20.6%	10.5%	20,400	78,000 (FRA only)
AMS	1.5bn	0.8bn	5.3%	23.2%	18.5%	2,000	65,000
MUC	1.2bn	-	1.3%	22.1%	8.3%	8,000	32,000

Frankfurt, Aéroports de Paris, London Heathrow, Munich, AENA and Schiphol, the leading EU airports (airport operators), provide in total around 54.600 direct jobs.⁶⁶ Employment, growth and profit in the airport sector takes place at hubs of the largest EU airlines groups, namely at Heathrow and Madrid, the hubs of British Airways and Iberia (AIG), Paris and Amsterdam, the hubs of Air France and KLM and Frankfurt and Munich the hubs of Lufthansa.⁶⁷

The total employment generated at a hub airport is significantly larger (including airlines, ground handling services, government services, catering and retail, other public passenger services, cargo services, building and maintenance contractors etc.). As an example these services account for 91% of the on-site employment at London Heathrow airport. The total economic contribution of London Heathrow is estimated to support around 190,000 full-time equivalent (FTE) jobs across the UK.⁶⁸ In 2001, prior a major airport expansion, Madrid

⁶² Flightglobal Airport ranking 2001.

⁶³ DG MOVE analysis of annual financial statements: Heathrow 12.2% (2013), Aéroports de Paris 14.4% (2014), Schiphol 18.5% (2014).

⁶⁴ DG MOVE analysis of annual financial statements.

⁶⁵ Hub airline, groundhandling, retail etc.

⁶⁶ DG MOVE analysis of annual financial statements: Fraport is the largest employer with 20.395 staff, AdP 8966, LHR 8001, Munich 8000, AENA 7247, Schiphol 2039.

⁶⁷ Airport Financials, Airline business.

⁶⁸ London Heathrow Economic Impact Study, A report by Regeneris Consulting, September 2013

<http://www.westlondon.com/wp-content/uploads/2013/09/130924-Regeneris-Final-Report-24th-Sep.pdf>

Barajas airport generated 27,000 direct, 25,700 indirect, and 102,500 induced jobs.⁶⁹ In 2013, 1,000 companies based at the three Paris airports operated by Aéroports de Paris, directly employed over 114,000 staff. In total, more than 340,000 jobs were directly or indirectly related, induced or catalytic to the activities of Aéroports de Paris which represent more than 8% of jobs in the Paris region.⁷⁰ At Amsterdam Schiphol airport 500 companies directly employ 65,000 people on site. In total, the airport directly and indirectly contributes to 290,000 jobs.⁷¹ Businesses at, around and in the value chain of Frankfurt airport generate directly and indirectly employment of 116,000 jobs (of which 78,000 are on-site, the largest local place of employment in Germany), in addition to 59,000 jobs induced by the airport.⁷² Direct employment at the around 550 companies at Munich airport is 32,000 jobs.⁷³

For all EU airports, largest contribution to the direct employment at airports is made by airlines which account for 28% of the on-site jobs.⁷⁴ A single EU network airline, accounts for more than 3,000 jobs at Berlin airports without using the airport as a main hub.⁷⁵ Every new aircraft put into service creates direct employment at airlines (cockpit crew, cabin crew, ground staff, maintenance, customer service), but beyond that contributes to jobs at the airport (handling, technical services, retail, security etc.) and in the whole aviation value chain, including the aeronautical manufacturing industry. The direct employment impact of a narrow-body aircraft (in terms of full-term equivalents at airlines) ranges from 35 to 200 jobs while the direct employment impact of a wide-body aircraft ranges from 100 to 800 jobs.⁷⁶ In other words, the direct employment impact of one additional aircraft alone is in the order of small/medium-sized enterprise or greater.⁷⁷

To compare, the total direct employment of Emirates airline, serving 30 destinations in EU, stands at 1,400 staff based in the EU.⁷⁸ Emirates offers 15.8m yearly seats with more than 400 weekly frequencies to the EU.⁷⁹ Etihad employs 657 staff in the EU and offers 4.4m yearly seats with more than 150 weekly frequencies.⁸⁰ Delta, employs 400 staff in the EU and offers over 13m yearly seats with more than 1,000 weekly frequencies.⁸¹

Considering the most conservative⁸² of the above-mentioned scenarios of direct employment created per long haul aircraft it results that the total employment of 28,800 staff related to Emirates' long haul fleet, 8,300 staff related to Etihad's long haul fleet and 16,800 related to Delta's long haul is mostly generated outside the EU. Indeed, taking into account the direct employment of those third country airlines in the EU, between 92% and 97% of direct employment is created at the respective hubs outside the EU. Given the likelihood that the total staff numbers of these airlines exceed the calculated staff numbers of this conservative scenario of employment

⁶⁹ Association for European Transport 2001, Barajas Airport – Madrid Connection Improving Accessibility, Carlos Cristobal and Jose Dionisio Gonzales, Studies and Planning Department – Madrid Regional Transport Consortium, Antonio Garcia Pastor, Technical Director CTSA.

⁷⁰ <http://aeroports-de-paris-at-a-glance-2013.webflow.io/responsibilities-and-performance>.

⁷¹ <http://www.annualreportschiphol.com/results/our-results/significance-for-the-region>.

⁷² <http://www.airliners.de/gutachten-frankfurter-flughafen-sichert-116000-arbeitsplaetze/31787>.

⁷³ http://www.munich-airport.de/media/download/general/publikationen/en/facts_and_figures.pdf.

⁷⁴ ACI, Economic Impact of European Airports, 2015, p.27.

⁷⁵ DG MOVE analysis of annual reports/publicly available CSR information.

⁷⁶ The considerable variation stems from differences regarding business models, fleet composition, aircraft age, collective aircraft configuration, utilisation, labour agreements, service concept, staffing levels and the degree of outsourcing certain services DG MOVE estimation; Flightglobal, 16 June 2014, <http://dashboard.flightglobal.com/app/#/articles/400429?context=>; IHK, Wirtschaft 04/2012, <https://www.muenchen.ihk.de/de/WirUeberUns/Publikationen/Magazin-wirtschaft-/Aktuelle-Ausgabe-und-Archiv2/Magazin-04-2012/Politik-und-Standort/Flughafen-Muenchen-Wo-das-Wachstum-landet>.

⁷⁷ Fewer than 250 persons as defined in the Commission Recommendation of 6 May 2003 (2003/361/EC) concerning the definition of micro, small and medium-sized enterprises.

⁷⁸ Presentation by the GCC delegation at the third meeting of the EU-GCC Aviation Dialogue, May 2015.

⁷⁹ OAG schedules for 2015.

⁸⁰ Presentation by the GCC delegation at the third meeting of the EU-GCC Aviation Dialogue, May 2015; OAG schedules for 2015.

⁸¹ MOVE analysis of Delta CSR Report 2014, OAG schedules for 2015.

⁸² 100 direct jobs per long haul aircraft – whereas the highest end would be 800 jobs per long haul aircraft.

per aircraft by at least 33% - it is also likely that the overall employment at the respective hubs is even higher.⁸³ For EU based airlines, the situation would be exactly the opposite – with the vast majority of employment created in the EU instead of in third countries.

An analysis of the total employment impact of the before mentioned key hub airports shows that while employment of the airport operators amounts to 54,600 jobs, direct employment by other companies based at these key hub airports, including in particular international network airlines, is at 378,000 – 8-times the airport operators' direct employment –, with a total contribution to 1,295,000 jobs.

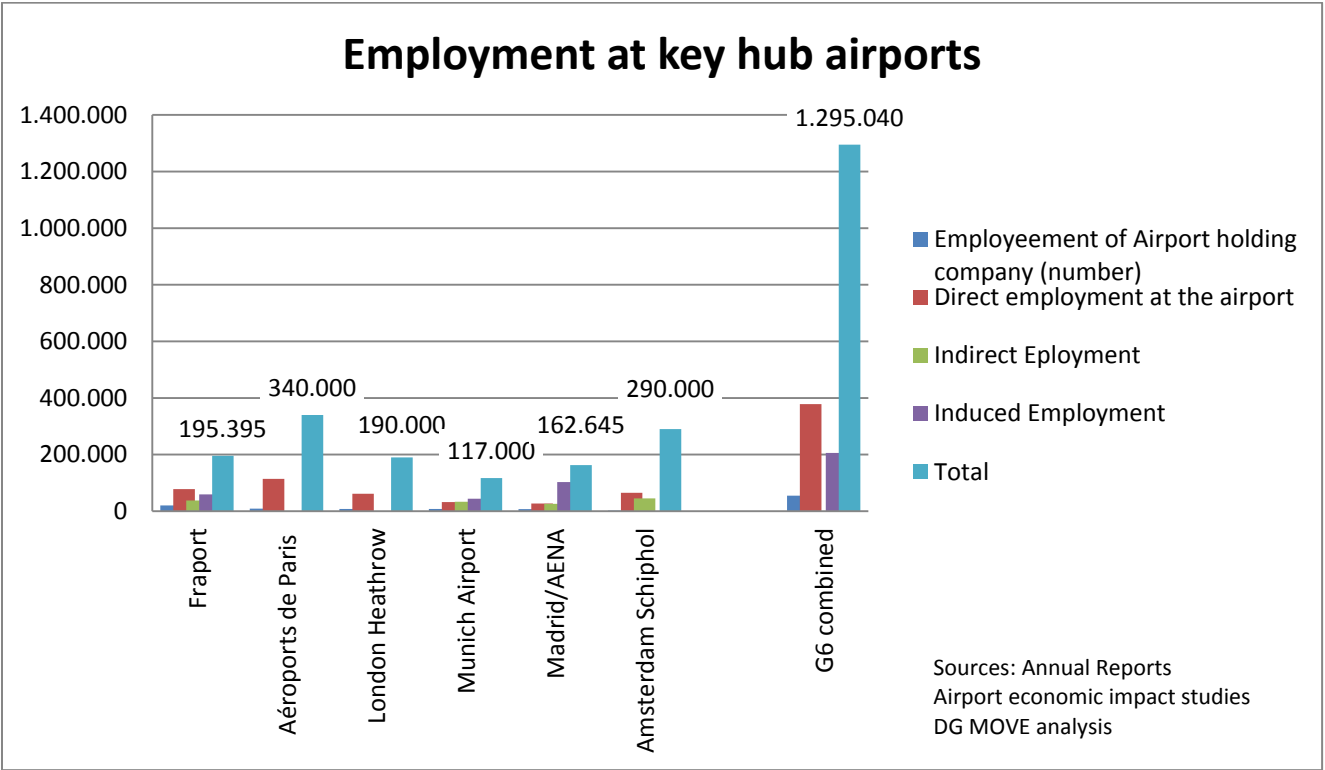


Chart 12 Employment at key hub airports

3.3 Competitiveness of Air Navigation Services Providers (ANSPs), auxiliary industry, manufacturing

The European air traffic management is currently provided by 37 ANSPs which in total employ 57,500 staff (2013).⁸⁴ In comparison, the US airspace, which covers about 10% less geographic area but 57% more controlled flights in an more complex airspace with higher density, only has a single ANSP with 35,500 staff.⁸⁵

More than 27,000 – or more than 45% of all EU air traffic controllers – work for the five largest ANSPs.⁸⁶ Comparing the profitability and revenues of ANSPs is difficult because of the different legal set-up and degree of regulation which reflect in annual reports where available. For example, the Spanish ANSP ENAIRE is a public business entity under the Spanish Ministry of Public Works that manages the air navigation in Spain but also holds 51% of AENA, one of the largest EU airport groups. In general, one can distinguish between "en-route" services financed by air navigation charges and other commercial activities or investments. While all streams of revenue are considered for the overall overview (were data is available), the "en-route" profit serves

⁸³ The Emirates Group in total employs 75,000, Etihad 25,000 and Delta 80,000 staff; MOVE analysis of airlines' annual reports.

⁸⁴ Eurocontrol, ATM Cost-Effectiveness (ACE) 2013 Benchmarking Report, p. 147.

⁸⁵ Eurocontrol, FAA, 2004, 2013: Comparison of Air Traffic Management-Related Operational Performance: U.S./Europe, p. 28.

⁸⁶ Eurocontrol, ATM Cost-Effectiveness (ACE) 2013 Benchmarking Report, p. 147.

as an indicator of the sector's profitability. In 2013 (2014 data available in September 2015), the profitability of those key ANSPs was between, indicated by the surplus for en-route activity, was between 5.4% (DFS) and 18.4% (ENAIRE). With the exception of NATS, a public-private partnership, all key ANSPs could improve their profitability compared to 2012. In 2013, many of the EU's ANSPs reported an economic surplus well beyond the planned ex-ante margins as specified in the European performance plan under the SES Performance Scheme.

Some ANSPs of other regions of the world operate with a less commercial mandate. For instance, the Canadian ANSP, is operating under the Canadian "Not-for-profit Corporations Act" while the Australian ANSP reported a net profit margin of 3.9% for 2013-2014.⁸⁷

Table 5 Overview of financial performance of key EU ANSP companies in 2014 (in EUR, y-o-y)⁸⁸

Company	Revenue	Revenue growth	Operating margin	Net margin	Surplus for the en-route activity ⁸⁹ (2012)	Surplus for the en-route activity ⁹⁰ (2013)	Employment ⁹¹
NATS (UK)	0.9bn	2%	-	17.2%	16.7%	10.2%	4,300
DFS (DE)	1.1bn	-0.2%	-	3.1%	-1.6%	5.4%	5,600
DNSA (FR)	1.4bn (2012)	-	-	-	4.6%	8.8 %	7,850
ENAV (IT)	0.84bn (2013)	1.3%	-	6%	4.9%	5.8%	5,700
ENAIRE (ES)	-	-	-	-	9.9%	18.4%	3,700

Auxiliary industries, such as ground handling and cargo handling, is an integral part of the EU's aviation value chain and in employed around 260,000 staff in 2013⁹². In 2013 the global industry's turnover was over USD 80bn – around 12% of the airline industry's turnover. Swissport, a European company, is the largest ground handling company in the world. John Menzies and Fraport are other globally leading EU ground handling services providers.

The aeronautical manufacturing industry, and its supply chains which include many SMEs, makes an important contribution of the EU's economy in terms of jobs, investment, research and innovation and foreign trade. The growth of the global aerospace industry and aerospace growth has been outpacing world GDP growth for years, in particular fuelled by strong demand in emerging economies which not least favours EU industry. 4 EU companies rank among the top 10 aeronautical manufacturing companies in terms of revenue, while the other 6 being US companies.⁹³

⁸⁷ Airservices, Annual Report 2013-14, p. 23.

⁸⁸ DG MOVE analysis of annual reports.

⁸⁹ Estimated ex-post RoE pre-tax rate; Eurocontrol, PRB Annual Monitoring Report 2013 Vol. 2.

⁹⁰ Estimated ex-post RoE pre-tax rate; Eurocontrol, PRB Annual Monitoring Report 2013 Vol. 2.

⁹¹ Eurocontrol, ATM Cost-Effectiveness (ACE) 2013 Benchmarking Report, p. 147.

⁹² SDG, Study on employment and working conditions in air transport and airports, Final Report, July 2015, p. 197.

⁹³ Flight International/PwC, Top 100 Aerospace Companies 2015.

Sales of the EU's civil aeronautical manufacturing industry increased from €81 billion in 2012 to €92 billion in 2014.⁹⁴ Direct employment in the civil aeronautical manufacturing industry is estimated to be between 287,000 and 381,000 jobs while the direct employment of the aerospace industry – military and civil – as represented by AeroSpace and Defence Industries Association (ASD) stood at 535,000 jobs in 2014.⁹⁵

EU aviation policy has a positive impact on the demand for aeronautical products. By liberalising market access which enables air traffic growth, by ensuring the regulatory framework for a healthy EU aviation sector as a customer base the products and by standardisation and certification efforts which are enablers for the export of aeronautical goods. The aircraft manufacturing industry operates on a world market with a structure and competitive functioning that differs to that of the air transport sector, with a duopoly dominating the market for large civil aircraft.⁹⁶

33% of Airbus' revenue is created in Europe. Airbus employs 138,622 staff (of which around 125,000 are employed in the EU and of which 55,000 are employed in commercial airliner manufacturing.⁹⁷ Airbus' order book is currently valued €857.5 billion, its 2014 revenues increased 5% to €60.7 billion and its net income increased 59% to €2.3 billion. 629 aircraft delivered in 2014 set a new company record.⁹⁸ The civil aeronautical manufacturing industry also includes airframe producers for the general aviation sector, such as Dassault aviation which delivered 90 civil aircrafts in 2014, providers of air traffic management systems and flight avionics solutions such as Thales (more than 17,000 direct staff) with an order book valued €8.7 billion. Agusta Westland (13,000 direct staff) and Airbus helicopters are both leading helicopter producers while Rolls Royce (24,000 direct staff in the aerospace division) produces engines for aircraft and helicopters – in total to more for than 35 types of commercial aircraft.⁹⁹ Together with their supply chains the civil aeronautical manufacturing industry made an important contribution to the EU's economy and exports. Standardisation efforts and regulatory convergence in the field of certification and common rule making by EASA contribute to the competitiveness of this part of the aviation sector. As a significant part of the revenues are generated through exports, aviation projects with key trading partners have been launched with a view to fostering EU industrial interests in key aviation markets where EU industry, such as China.

⁹⁴ ATAG, Aviation benefits beyond borders 2014; SDG, Study on employment and working conditions in air transport and airports, Final Report, July 2015, p. 50; ASD, Facts and Figures 2014.

⁹⁵ ASD, Facts and Figures 2014.

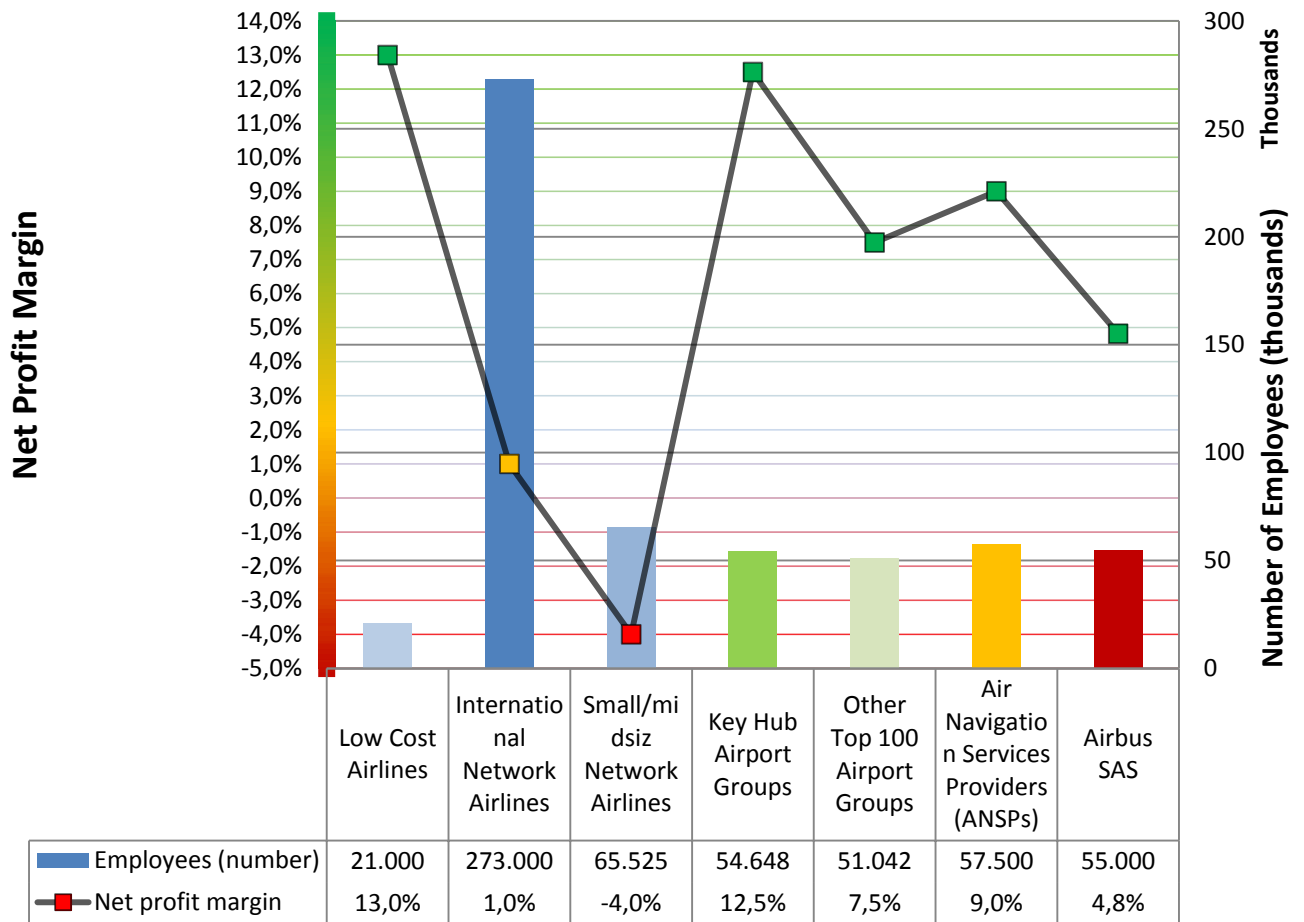
⁹⁶ Flight International/PwC, Top 100 Aerospace Companies 2015.

⁹⁷ Airbus CRS Report 2014, p.8: Europe 33%, Asia-Pacific 32%, North America 16%, Middle East 11%, Africa/Central and South America 8%.

⁹⁸ Airbus Annual Report 2014.

⁹⁹ Annual Reports Dassault Aviation, Agusta Westland, Roll Royce and Airbus.

Job-Profitability Discrepancy in the EU



Source: MOVE analysis of Annual Financial Reports; Flightglobal Airline Business; Airport Group Financials 2014; Eurocontrol, ATM Cost-Effectiveness (ACE) 2013 Benchmarking Report; Eurocontrol, PRB Annual Monitoring Report 2013 Vol. 2; Forthcoming SDG employment study; Estimation of profitability of ANSPs deducted from a selection of ANSPs; selected representation of the civil aeronautical manufacturing industry with Airbus commercial aircraft

Low Cost Airlines: Ryanair, Easyjet, Wizz Air

International Network Airline Groups: Lufthansa Group, AirFrance-KLM, International Airlines Group

Small/midsize Network Airlines: TAP, LOT, SAS Group, Finnair, CSA Czech Airlines, Aegean Airlines Group, Alitalia (2013), Airberlin, Adria Airways, Croatia Airlines, Flybe, Air Baltic, Estonian Air, Aer Lingus, Air Europa, Brussels Airlines

Key Hub Airport Groups: London Heathrow Airport Holdings, Aéroports de Paris, Fraport, AENA, Schiphol Group, Flughafen München

Other Top 100 Airport Groups: Manchester Airports Group, SEA Milano, Gatwick Airport, Aeroporti di Roma S.p.A., Flughafen Wien, Swedavia, Dublin Airport Authority, ANA - Aeroportos de Portugal, Copenhagen Airports A/S, Brussels Airport Company, Dusseldorf Airport, Finavia, Flughafen Berlin Brandenburg, Flughafen Koln-Bonn, Athens International, Flughafen Hamburg, Budapest Ferenc Liszt International*, Flughafen Stuttgart, Aeroports de la Cote d'Azur, Prague Vaclav Havel,

Polish Airports State Enterprise, Aeroports de Lyon, SAVE Group, Edinburgh Airport, Hannover Airport, Birmingham Airport Holdings

* Direct employment of airport operator estimated

Chart 13 Job-Profitability discrepancy in the EU

4. The future of the EU aviation sector in the world

In the last 50 years, continuous growth of air traffic has been observed, with only slight slowdowns in times of crisis which however did not change much the overall growth curve¹⁰⁰. Air travel has proven to be resilient to external shocks growing 73% over the last 10 years, and there is in general a strong stochastic relation between the growth of economies and the growth of traffic.

The European Union and Europe as a whole have always been a stronghold in aviation. In 2013, 842 million passengers were carried in Europe which is approximately 30% more passengers than ten years earlier or a growth of 2.9% a year on average. For the year 2014, ACI-Europe reported that passenger traffic in the EU grew by 4.9% compared to the previous year, whereas non-EU European airports were able to grow passenger traffic by 7.3%.¹⁰¹ Today, Europe's share in worldwide scheduled passenger traffic is 27%, almost a third of worldwide traffic¹⁰². However, this situation is changing as the rapid economic growth of Asia is pulling the centre of the world economy – and the air transport industry that services it – inexorably to the East. Projections for the next 20 years foresee that Asia will be the new hot spot where – thanks to a rising middle class – much economic activity will concentrate on and where it will be important for air transport to focus on too. China is expected to become the world's largest air transport market, overtaking the United States of America in 2023 in terms of number of passengers carried.¹⁰³

Case study: The EU-ASEAN air transport market

Demand for air transport between the EU and the ASEAN regions is booming – in line with the above mentioned forecasts. This demand is addressed by direct EU to ASEAN traffic as well as increasingly by indirect connections via third-country hub airports): While the direct traffic has seen growth of 7% compared to 2005 levels, the actual origin-to-destination traffic (including both direct and indirect traffic) has grown by more than 75%. Also the number of directly served EU-ASEAN city pairs grew by 10% compared to 2005 while the number of competing carriers offering direct services on EU-ASEAN routes has decreased by 15%.

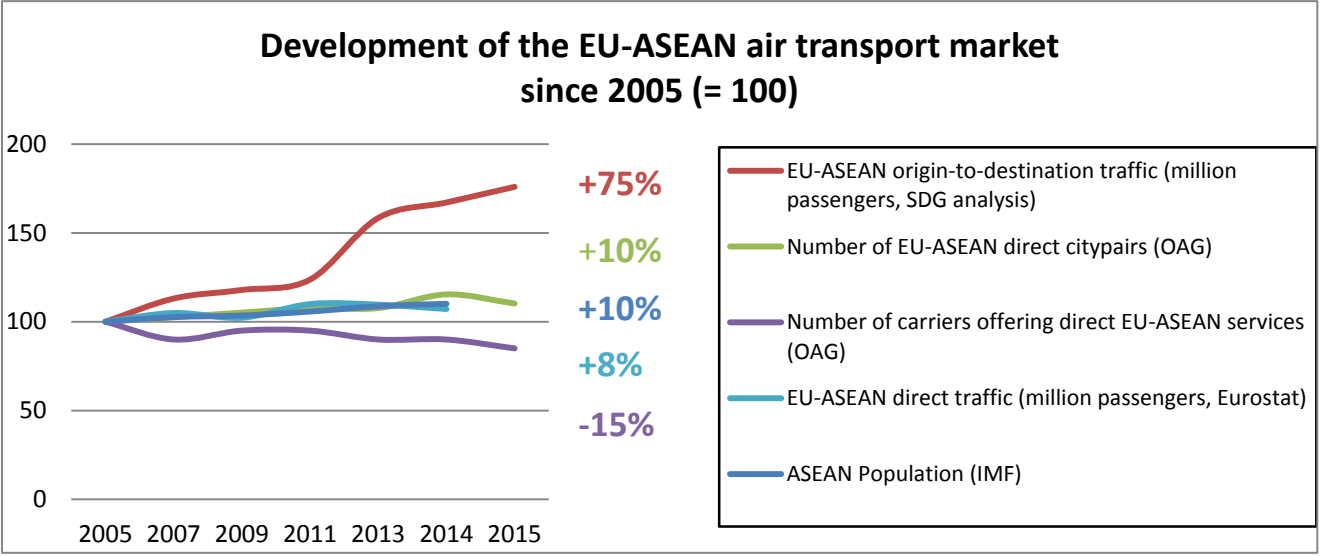


Chart 14 EU-ASEAN air transport market development 2005-2015

¹⁰⁰ See Flying by numbers 2015-2034, Global Market Forecast of Airbus, p. 71.

¹⁰¹ ACI Europe.

¹⁰² Flying by numbers 2015-2034, Global Market Forecast of Airbus, p. 10.

¹⁰³ Airbus.

Airbus predicts that the worldwide scheduled passenger traffic will develop further doubling today's results within 15 years¹⁰⁴. This means a 4.6% year-on-year boom between 2013 and 2033 worldwide¹⁰⁵. This high level of expected growth is however going to be evolving at different pace between world regions. The Asia Pacific region is expected to grow the fastest (by 5.6% year-on-year until 2034) and will account for around 40% of the world air traffic (measured in RPKs) in 20 years.¹⁰⁶

In more general terms, the growth of Asia's share of global traffic will be for the disadvantage of the European growth rates (3.9% growth y-o-y) and North American (3.4% y-o-y) of traffic, which Airbus expects to account for a combined share of 37% in 2033 (vs. 48% in 2014, over 60% at the beginning of the century). In real terms the volume of traffic in Europe will continue to grow but Europe's overall share of global traffic is expected to be lower than it was at the beginning of the century. While rising wealth is translating into demand for air transport services and manufacturing products, several factors from fluctuating oil prices to turmoil in certain regions of the world, such as the Middle East, or an increasingly volatile economic environment in Brazil or China might impact on the prospect for EU exports of aviation products and services. Also, new competitors from emerging economies enter the aeronautical manufacturing industry. A challenge – and opportunity – for the competitiveness and future growth of the EU aviation sector, in particular for the air transport and aeronautical manufacturing industries, will therefore be to tap into and seize the opportunities offered by the significant growth in emerging economies.

The rise of strong competitors in the Gulf countries and Turkey is linked to this shift of the world's economic centre of gravity to the East. The geographical position of these countries enables them to tap into the rapid economic growth of Asia. Yet, as the UK Airports Commission on airport capacity in London and the South East of England put it in its interim report, "geography is not the only factor that determines the location of international hub airports. The availability of suitable infrastructure, the nature of economic, fiscal and regulatory regimes in different countries, and historic, cultural and trading links all play a part."¹⁰⁷

On the other hand, in the European domestic market, which can be considered a mature market, a further moderate growth is expected. The network of low cost airlines is expected to grow further as there is still significant great potential in this segment. Low cost airlines' networks are also expected to focus on medium-haul traffic and even develop long-haul low cost flights in the future.

New types of aircrafts that fly longer distances and carry more passengers making travel more efficient are already there and will continue to expand. There is an expectation that the biggest orders will be realised for short and medium haul aircrafts (around 88% combined single-aisle and small twin-aisle aircrafts combined) worldwide in the next 20 years. The same share in Europe is 81%, in Asia-Pacific 86%, in North America 95% but in the Middle East only 61% showing that this latter region concentrates more on long-haul hub flights by 16% of the orders going for very large aircrafts, such as Airbus A380 or Boeing 747.

These and other industry trends will have profound effects on aviation. As the UK Davies Commission put it in its interim report, "some argue that airline alliances, and the hub and spoke networks that they operate, will remain central to the way the industry works. Others maintain that a wider range of airports will start to operate some form of hub, even where they lack a major network carrier, by enabling passengers to "self-connect" or by

¹⁰⁴ Flying by numbers 2015-2034. Global Market Forecast of Airbus p. 41.

¹⁰⁵ Boeing forecast 5% y-o-y growth, thus Airbus by its Current Market Outlook 2015-2034 is slightly more conservative in forecasting. Yet the two companies' market outlook is in parity. This evaluation is based on Airbus figures but we shall mention that Boeing figures are very similar to those of Airbus.

¹⁰⁶ Flying by numbers 2015-2034. Global Market Forecast of Airbus p. 55.

¹⁰⁷ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/271231/airports-commission-interim-report.pdf point 2.24.

hosting new partnerships between low-cost carriers and other airlines. A third view is that new aircraft with longer ranges will make more long-haul destinations viable as point-to-point routes, resulting in a decline in the importance of hubs".

Similarly, there can be several possible scenarios for European airlines and airports at mid-term:

1. Business as usual, where LCCs and legacy carriers continue to co-exist on short and medium haul flights with no significant breakthrough from LCCs on long-haul flights;
2. Hub orchestrator, where legacy airlines are positioned on long-haul only and there is a predominance of LCC on short and medium haul. This means co-existence of low-cost and "premium" terminals in airports and airport's positioning is a catalyst concerning connections between low-cost and legacy (long-haul) flights;
3. Western-oriented hubs, where Europe progressively loses transfer traffic to the hubs in the Middle-East and major European hubs are reduced to secondary hubs;
4. Low-cost secondary airports, where LCCs dominate European airports and European legacy carriers shrink and disappear and where airport terminals need to be reduced and adapt to the changes.

As the European Observatory on airport capacity & quality states in its 2015 report on "Airport capacity in the EU: a strategic perspective"¹⁰⁸, "these futures need not be alternatives – the reality may be some amalgam of them all. But this uncertainty needs to be factored into any strategy. The low-cost model itself has gone from inception to short-haul prominence within 25 years, so in planning for a future 20-25 years hence, airlines and airports need to be nimble, flexible and to allow for the evolution of current business models and the arrival of new ones".

¹⁰⁸ The report "Airport capacity in the EU: a strategic perspective" is available on DG MOVE website

CHAPTER II

'A COMPETITIVE EU AVIATION SECTOR TO IMPROVE CONNECTIVITY, GROWTH AND JOBS'

1. Introduction

The EU Single Aviation Market is one of the European Union's success stories. EU action in this field has transformed the market. Today, the EU aviation sector counts for almost one third of worldwide schedule passenger traffic. However, the situation is rapidly changing.

The Commission has examined the question of the competitiveness of the EU aviation value chain as an enabler of growth and jobs in Europe, given the ever increasing interdependence between economies on a global scale. It concluded that there is a need for further changes to the EU aviation system, in particular capacity and efficiency improvements as well as a better-performing regulatory framework. In this connection, the existence of appropriate air connectivity for all EU citizens and businesses has raised concerns over the past months and this is why the Commission has also taken a detailed look at this issue.

In this connection the Commission's services have considered the results of the public consultation¹⁰⁹ carried out between March and June 2015 on an "Aviation package for improving the competitiveness of the EU Aviation sector". The five most important areas mentioned by the respondents that identified themselves as professional stakeholders - based on responses that either indicated an area important or very important - to improve the competitiveness of the EU aviation industry were: (1) air traffic management (2) infrastructure including airports (3) regulatory harmonisation (4) market access and (5) digital innovation. Yet other domains scored high enough to focus on, too¹¹⁰.

To address the issues raised, the Commission's services have identified a mix of policy initiatives and regulatory measures that may be considered with a view to enhancing the competitiveness of the EU aviation sector. This chapter presents a first set of possible policies and measures which form a package aimed at providing an amended regulatory and economic framework, and cover a wide range of areas such as the evolution of air connectivity in Europe and the profitability along the aviation value chain. An essential pillar of this mix includes a further development of the EU External Aviation Policy through both comprehensive aviation agreements and regulatory convergence to the benefit of the entire EU aviation sector. The considerations developed focus on capacity and efficiency challenges meaning the importance of disposing of suitable infrastructure both in the sky and on the ground to accommodate future demand for travel combined with the importance of providing quality and competitive air services to EU citizens and businesses. Account has been taken of the ever increasing global direct competition, as well as the call for reduction of costs and increased efficiency.

¹⁰⁹ The number of responses by private persons was limited (i.e. 70) and came largely from Western European countries (63 responses). It would also seem that more than 20 of these respondents sent coordinated answers with replies being identical. Thus, the findings concerning the view of private persons should be handled with extra caution in view of limited level of representativeness.

¹¹⁰ <http://ec.europa.eu/transport/modes/air/consultations/doc/2015-aviation-package/synopsis-report.pdf>.

2. Enhancing the competitiveness of the EU air transport sector

2.1 A competitive assessment

By providing mobility to citizens and businesses within and among Europe's regions and beyond, and by facilitating trade, tourism and foreign investment, the air transport sector generates economic and social benefits well beyond the immediate air transport industry. Aviation is also a sector in which Europe has a recognised worldwide leadership in several areas, both in terms of products and services, based on innovation and quality.

Over the last 20 years, as a result of liberalization of the internal market and substantial growth of demand within the EU and worldwide, the EU aviation sector has developed steadily. Now there is more competition, more choice, more routes and the chance to fly from anywhere to anywhere, safely, less costly and more efficiently. Most citizens have come to expect that; many businesses have come to depend on it. However, further changes to the EU aviation system are necessary.

Change has not only taken place within the EU aviation market. As described in Chapter I, the international aviation sector outside Europe has also been witnessing some significant developments. In particular, the emergence of new, strong competitors in regions such as Turkey, the Middle East and Asia is posing a considerable challenge for European hub airports and carriers. At the same time, these developments and the air traffic growth which is forecasted worldwide open whole new opportunities for the EU aviation sector. Therefore, the question is whether the sector is well prepared to cater for the air traffic growth which is expected to occur in Europe in the next 20 years albeit at a moderate rate. Just as important is the question of whether the EU aviation sector is ready to tap fully into the opportunities offered by the extremely rapid economic growth in these regions, notably Asia which is pulling the centre of the world economy – and the air transport industry that services it – inexorably to the East.

The Commission's services consider that the EU policies may play a role in helping the sector address the challenges and opportunities it faces. Thus, the European Economic and Social Committee expressed the view that the competitiveness of EU aviation is at stake and that the EU needs an integrated aviation strategy. On this basis, the Committee identified six drivers of competitiveness i.e. safety, sustainability, innovation, social dimension, operational excellence and connectivity¹¹¹. ICAO¹¹² found that in order to optimize air connectivity, a strong supporting policy framework is required including measures enabling expanded market and capital access of both air transport and tourism sectors. In this regard, continuous opening-up of the aviation sector to competition at all levels through liberalising measures has an overall positive impact on the growth of air traffic, tourism and the economy at large. This leads to increased air transport connectivity and lower fares, which, in turn, stimulate additional traffic and bring about increased economic growth and employment.

2.2 Competitiveness in the public opinion

The public consultation¹¹³ showed that for the overwhelming majority of the respondents, EU carriers face challenges when competing with non-EU carriers. When asked to rank the challenges / obstacles EU carriers face on extra-EU markets, the issues that were mentioned most often were cost advantages of non-EU carriers, more favourable tax regimes and the issue of potential subsidies.

¹¹¹ TEN/569, An integrated EU aviation policy (exploratory opinion requested by the Commission), EESC-2015-01083-AS-TRA.

¹¹² http://www.icao.int/sustainability/Documents/Connectivity/SDG_Indicator_Connectivity.pdf.

¹¹³ <http://ec.europa.eu/transport/modes/air/consultations/doc/2015-aviation-package/synopsis-report.pdf>.

On the latter, a majority of respondents was of the opinion that state subsidies by third countries for non-EU carriers are an important competitive disadvantage for EU carriers. Some respondents, however, strongly argued against the existence of such support. The same response pattern can be identified when it comes to the question of unfair commercial practices of non-EU carriers.

More neutral opinions were expressed with regard to the question of possible discrimination of EU carriers by non-EU States or non-EU service providers. The overall response was also rather balanced when it comes to the comparison of the attractiveness of products and services of EU / non-EU carriers, the question of potential overcapacity in the markets or the potential issue of a geographic advantage of non-EU carriers over EU carriers.

When it comes to the main areas for future work to improve the global standing of the EU's aviation sector, three areas were particularly highlighted 1) fair competition 2) regulatory harmonisation 3) taxation. Most respondents expressed the view that these issues should best be addressed at international level (ICAO) or at EU-level e.g. through the negotiation of comprehensive air transport agreements.

Asked to name interesting countries/regions for possible future comprehensive air transport agreements, most respondents, across industry sectors and from diverse stakeholder groups, named the Gulf States in general or the United Arab Emirates and Qatar. China, ASEAN, Mexico and Russia were mentioned often – the latter however conditional on a resolution of the issue of Siberian overflight payments. Japan and India, and to a lesser extent African States or South Korea, were mentioned also as potential candidates. Some of the EU's neighbouring countries, such as Turkey were also mentioned as interesting and important growth markets closer to home.

3. Connectivity matters

An issue which has been discussed extensively in the recent debate over the competitiveness of the EU aviation sector is the existence of appropriate air connectivity for all EU citizens and businesses. The public consultation showed strong support for the assumption that connectivity matters for all kinds of stakeholders as 97% of the respondents acknowledged that connectivity is somewhat or completely relevant for the overall economic development.

Connectivity matters to the economy. Several studies have shown that there is a high level of correlation between connectivity and growth.¹¹⁴ With regard to the EU's outermost regions in particular, air connectivity is a key enabler of developing the full potential of outermost regions' (ORs) economic and social development. Therefore the Commission, as set out in the renewed EU strategy on the EU's outermost regions, underlined the importance of reinforcing of air connectivity for ORs, including to third neighbouring countries.¹¹⁵

The better a city, a country or a region is connected by air to other destination and parts of the world, the more growth can be created and vice versa: the richer, more developed or more generally, the more attractive the country, city or region, the better connected they are. In 2015, ACI-Europe found that taking into account catalytic, induced, indirect and direct economic impacts of airports, a 10% increase in air connectivity is associated with an increase in GDP per capita of 0.5%. Additional analysis found that this relationship is two-

¹¹⁴ CAPA Yearbook 2014 centreforaviation.com/reports/files/39/yearbook_2014_final.pdf.

Jean-François Arvis, Ben Shepherd: Policy Research Working Papers The Air Connectivity Index: Measuring Integration in the Global Air Transport Network, 2011 <http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-5722>

¹¹⁵ Communication from the Commission, "The outermost regions of the European Union: towards a partnership for smart, sustainable and inclusive growth", COM (2012) 287.

way: as an economy grows, it supports a larger air transport sector, but it is also the case that growth in air transport supports economic growth¹¹⁶

Yet, recent studies¹¹⁷ on the topic have shown that while the increase in airport connectivity has been impressive over the past ten years and EU airports still account for the bulk of Europe's connectivity, including EU and non-EU states, this cannot be taken for granted. Airport connectivity in Europe is also unevenly spread which may have a clear competitive disadvantage for less connected countries. This also applies for airports of the Western Balkans and their connections to the EU.

3.1 Definitions, sources of analysis

Connectivity is a broad concept meaning an important attributor to satisfy the demand to meet clients face-to-face, to participate in events, to win new businesses and to enable families and people in general to reach each other where physical geographic separation exists. In this way, connectivity enables people and businesses to travel efficiently and get effectively to a wide range of destinations. A stricter –definition, providing for better measurable results, is used by ACI i.e. connectivity is a measure of the number of destinations, the frequency of services and the quality of connections (in the case of hubbing or indirect services).

In this context, the quality of a connection is one of the factors which are being looked at. In particular, the quality of a connection – and as such, the efficiency to get from A to B – can be described by whether or not it provides for direct or indirect connection (a transfer is necessary to reach the final destination), whether flights are available at the right time of the day or the week from the perspective of consumers (meaning frequency is an important attribute to the quality of the connection), whether flights and connections are reliable, how easy airports are accessible, for what price the journey can be made and how connections relate to actual or potential demand. Therefore, in case of indirect services, connectivity grows if the movement of passengers, freight and mail involves transit points that make a trip as short as possible with optimal user satisfaction at the minimal price possible¹¹⁸.

As for the connectivity between Europe and other world regions, the figures and findings of the "Airport Industry Connectivity Report 2014" of ACI-Europe¹¹⁹ have been used. In this report, ACI-Europe analysed airport connectivity of Europe vis-à-vis other world regions using the SEO NetScan connectivity model which well describes the state of play of connectivity.

As for the intra-EU connectivity, an analysis of connectivity in Central, Eastern and South-East Europe (CESE)¹²⁰ commissioned by the Commission and developed by PwC was also used.

It should also be mentioned that besides scheduled air services, business aviation¹²¹ also makes a contribution to developing and strengthening connectivity. However, its focus is on flexible point-to-point operations. In addition, different to scheduled flights, business aviation is based upon carrying a low volume of passengers between a much larger number of potential destinations¹²². Even through the global crisis the business aviation

¹¹⁶ Airport Council International-Europe's Report on "Economic Impact of European Airports.

¹¹⁷ See CESE study of PwC or the ACI Europe connectivity study of 2014 cited below, http://ec.europa.eu/transport/modes/air/studies/internal_market_en.htm.

¹¹⁸ <http://www.icao.int/sustainability/Pages/Connectivity.aspx>.

¹¹⁹ <https://www.aci-europe.org/component/downloads/downloads/3953.html>.

¹²⁰ http://ec.europa.eu/transport/modes/air/studies/doc/internal_market/2014-12-overview-of-air-transport-and-current-and-potential-air-connectivity-gaps-in-the-cese-region-paper-a.pdf.

¹²¹ Business Aviation is an air transport option tailored to the specific needs of company executives. It provides efficient, productive and secure business travel to accommodate schedules and reach destinations not compatible with the limitations set by commercial airline itineraries.

¹²² 88,000 airport pairs in 2011.

network continued to widen, reaching 103,000 airport pairs by 2014¹²³. This development can play a particularly crucial and complementary role in integrating regions of Europe as well as support economic links to emerging markets.

Consequently, connectivity can be measured in a variety of ways and at various levels of granularity. One can analyse direct and indirect connectivity (whose addition results in total connectivity) where indirect connectivity is according to ACI-Europe report considered less valuable than direct connectivity, given the increased travel times. However, one should remember that indirect connectivity is growing and often much stronger than direct connectivity and also that in some cases may provide connectivity that would not be available otherwise. In this context, one may find useful to look at the level of intra-EU or extra-EU connectivity.

3.2 Connectivity within Europe

The liberalisation of the European aviation market in the 1990s has led to a very significant increase in the total number of route connections operated within the EU (both domestic and intra-EU) from approx. 1,700 routes in 1992 to more than 4,300 in 2014 (+155%) whereas the number of cross-border routes within the EU increased even more (+285%). The intra-EU total connectivity has never been as high as it is today.

ACI-Europe observes that the growth of total connectivity in last two decades, and especially during the period between 2004-2014, reflects the dynamic development of low cost airlines, which have opened numerous direct connections out of small and regional airports (+23% increase in direct connectivity), which were often not served before. Furthermore, as stipulated by ACI-Europe, this resulted in increased opportunities for these airports by the network impact – through connections via larger airports (+62% in indirect connectivity).

Between 2004 and 2014, connectivity increased between all groups of airports, with the highest growth of total connectivity out of small and regional airports (+46%), but also strong growth of total connectivity out of largest European airports (+34%). At the same time ACI-Europe shows¹²⁴ that 2015 has been very positive year for European total air connectivity, by an increase of the latter of 8.9% in comparison to 2014 levels. This trend was driven by 4.6% increase in direct connectivity and 11.1% increase in indirect connectivity.

Both the ACI-Europe's study and the CESE study refer to a clear connectivity gap between Western and Eastern Europe in the periods respectively 2004-2014 and 2004-2013. Interestingly, based on the Netscan data – used by ACI Europe –, the five Member States where the largest hubs in Europe are located (Frankfurt, Paris CDG, Amsterdam, Madrid and London LHR) have more than 43% direct connections towards European countries than the other 23 Member States together¹²⁵. However, this data, while showing absolute values, cannot be simply taken on face of its value.

The absolute levels of direct connections from five biggest Member States in the European Union being significantly higher than from other Member States can be attributed to many other factors, such as relative size of the countries (e.g. absolute number of population), relative size of the five Member States' economies (i.e. GDP), relative importance of the cities where hubs are located and from which direct connectivity is being considered (e.g. London and Frankfurt being financial centres of Europe) or actual demand for air services (e.g. in view of purchasing power).¹²⁶

¹²³ <http://www.ebaa.org/en/facts-figures/quick-facts.aspx>.

¹²⁴ 'Airport Industry Connectivity Report for 2015'.

¹²⁵ See Annex 2.

¹²⁶ See also ACI-Europe 'Airport Industry Connectivity Report for 2015', which indicates that the fate of individual airports is closely linked with national economic performance and its size (p. 7).

The CESE study developed a methodology to calculate connectivity and rank countries. Two indexes were established, one for business connectivity and another for leisure connectivity. Both indexes show that there exists a significant connectivity gap between Member States. The business connectivity on average level per country is 7.5 times higher in the EU15¹²⁷ than in the EU13¹²⁸ Member States. Similarly, the leisure connectivity shows more than nine times higher values for EU15 countries than for the EU13 Member States. On the other hand, it must be remarked that these gaps have been closing in the last 10 years, and that the best connected countries in EU13 (Poland and Slovakia¹²⁹) were at the end of the 10 year period at a similar level of connectivity as the worst connected ones in EU15 (Finland, Greece and Belgium) in terms of overall connectivity¹³⁰. At the same time, the level of business connectivity between the best (the UK) and worst (Slovenia) connected country in the EU is striking: the UK is 68 times better connected than Slovenia – based on the business connectivity index. However, one also needs to take account of the fact that Slovenian GDP per capita is half of the UK one and that its overall population represents 25% of the population of the UK capital city alone.

In case of routes offered for intra-EU destinations in a given country¹³¹ – similarly to the extra-EU dimension –, there is a significant difference in absolute numbers between the best performers (UK, Spain, Germany, Italy, France and Greece¹³²) and the rest of the Member States. The top 6 countries offer 500+ direct routes each and the remaining Member States only below 230 direct routes each; the worst performer is Slovenia with only 12 direct routes available from the country. Of course, the fact that smaller countries offer fewer direct flights in comparison to those with higher population does not necessarily mean that a country is less connected. Economic analysis, however, shows that in most cases the connections are indirect in case of smaller countries, which has a negative impact on passengers and businesses residing in smaller countries or those doing business with economies mainly indirectly connected.

One can also observe connectivity from a business model perspective. The market share of LCC in the EU as per capacity was close to 47% in 2014, which is 27 percentage points growth from 2004¹³³ (network and LCCs owned the same level of available seat capacity in 2011 when the LCCs outnumbered the legacy carriers). The Member States that are mainly dependant on low cost traffic are Spain (with low cost carriers accounting for 61% of available capacity), Hungary (60%), Lithuania (56%), Italy (53%) and Poland (52%). This means great growth and job opportunities for those markets, be direct, indirect or induced, however, also entails risks given that route stability of LCCs is less than those of legacy carriers due to their business model¹³⁴. In addition, LCC do not usually offer connecting flights which means that the value of indirect connections as such may be less high than that for legacy carriers offer indirect connections through interline and codeshare agreements and airline alliances may offer the right product for transfer passengers. However, it should also be observed that for connecting passengers, some of the Member States that are most dependent on LCCs have a significant network of legacy carriers, such as for example Spain and Italy. For the others (e.g. Hungary, Poland), most capital cities keep a link to other large hubs in the EU, which provide them with connecting flights. Yet, the quality of connection is different from that of those mentioned. It should be borne in mind, however, that the development of the market is dynamic and evolving. Low cost carriers have entered new segments in the market by, for example, increasing their presence at large hub airports and widening the distribution network for their products

¹²⁷ EU15: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, United Kingdom.

¹²⁸ EU13: Bulgaria, Cyprus, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia.

¹²⁹ Considering Vienna as main departure point for Slovakia, due to the proximity to Vienna.

¹³⁰ See Annex 3.

¹³¹ See Annex 4.

¹³² Note that Greece being a typical sun destination holds high number of routes that exist mainly in summer only.

¹³³ http://ec.europa.eu/transport/modes/air/studies/internal_market_en.htm.

¹³⁴ http://ec.europa.eu/transport/modes/air/studies/internal_market_en.htm.

for business travel. It cannot be ruled out that in the future, cooperation between 'network' carriers and LCs might increase the number of convenient connections available to passengers throughout Europe.

In a nutshell, the CESE study shows that:

- The aviation market in the EU13 region is not 'mature' relative to EU15, and the scale of operations is lower;
- Fragility and sometimes loss of regional network carriers may reduce hub traffic and lead to disappearance of a business connectivity point or a regional hubs in case of a bankruptcy of the dominant regional legacy carrier. The hub function of the lost airline may be replaced either by another legacy carrier or by a LCC. This may entail a risk that the given airport (severely shrinking or disappearing) as a consequence can no longer serve a business connectivity point;
- Such a loss of regional legacy carrier may also reduce the volumes of air cargo handled which has a negative effect on economies.

While the CESE study shows risks associated with fragility of some regional network carriers and possible impact on regional hubs, it is important to keep in mind that as long as there is demand for air transport services and/or it is possible to provide air transport services under economically acceptable conditions, existing regional hub is likely to remain and survive a loss of legacy carrier. Thus, the mere fact of an exit of a legacy carrier from the market may indicate that there is no sufficient demand for air traffic services at an existing regional hub, which may require additional reflections on the necessity and suitability of preserving such a regional hub.

Also, the CESE study has shown that the following is important:

- Connections are safeguarded to primary/secondary hubs, which is key to business/onward connectivity;
- Strong flag carriers in a region can contribute to reduce effect of economic difficulties and smoothen a recover;
- The absence of key alliances in CESE countries results in limited offer of seamless connections to the wider air network and does not ensure competitive air fares;
- For short-haul, an efficient and effective intermodal option is developed to alternate air traffic.

3.3 Connectivity vis-à-vis other world regions

The ACI-Europe Airport Industry Connectivity Report 2014 shows that across Europe, total connectivity has increased by +38% between 2004 and 2014 which is equivalent with 3.3% growth year-on-year. Growth has been strongest to the Middle East (+95%) and Asia-Pacific (+88%). However, in the case of Asia-Pacific, connectivity growth has been mainly indirect in nature (90% vs. 48% of that of direct connectivity) due to increased direct connectivity to the Middle-East and Turkey.

The report also shows that, while EU airports are still four times better connected than non-EU airports, the gap is closing. Between 2004 and 2014, the total connectivity at non-EU airports doubled. The difference in connectivity growth rates between EU and non-EU airports over the last decade may be due to economic maturity. Also, the crisis in 2008 hit EU airport connectivity harder. EU direct connectivity has particularly suffered from the 2008 crisis and has not yet recovered from the pre-2008 highs although 2015 was a very positive year as regards direct connectivity within Europe (+4.5%) and to North America (+6.3%) . For

instance, it was still -7% down in 2014 compared to 2008. In contrast, non-EU direct connectivity was +34% above pre-crisis levels.

Thus, it can be concluded that between 2004 and 2014, growth of airport connectivity in the EU is largely attributable to growth in indirect connectivity (+38% growth of indirect connectivity vs 9% growth of direct connectivity), where indirect connectivity is according to the ACI-Europe report considered less valuable than direct connectivity, given the increased travel times, especially for business travellers. However, there may be further considerations to be taken into account.

First, recent competition investigations, both in relation to trans-Atlantic joint ventures as well as merger assessments¹³⁵, showed that especially on long haul flights one-stop flights (i.e. indirect connectivity) can be considered as a competitive constraint for non-stop flights (i.e. direct connectivity), where connecting times do not prolong the overall travelling time significantly.

Second, the findings of these competition investigations are in line with the figures presented above, which show significant growth in indirect connectivity while direct connectivity declined. This could indicate that indirect connectivity, from the perspective of the consumer, may be an alternative to direct connectivity.

Figures available for 2015 seem to confirm the highlighted trend¹³⁶. In particular, although 2015 was a good year for EU airport connectivity, with direct connectivity growing by a healthy +4,3%, this was not sufficient to restore EU's pre-crisis strength with the result that 2015 direct connectivity is still a significant -3% below 2008 pre-crisis levels.

As for the onward connectivity i.e. the indirect connectivity that is channelled through hub airports and can be defined as the total indirect connectivity aggregated by intermediate hub airport, between 2004 and 2014, the share of EU hubs in onward connectivity has decreased by 10% to the benefit primarily of non-EU European hubs (+307%) and non-European hubs (+53%). Istanbul-Ataturk, Moscow-Sheremetyevo and Dubai airports have all joined the list of top 20 hubs for onward connections from Europe, with a combined market share of 10%. The higher growth rate of non-EU and non-European hubs may be due to market maturity in the EU compared to dynamic growth there but also to the available capacity at these hubs and reflects increased hub competition, in particular between EU hubs on one hand and Turkish, North American and Gulf hubs on the other hand.

In terms of hub connectivity i.e. hubs facilitating travel from one world region to another, European hubs have faced fierce competition from hubs located in other world regions, in particular the Middle East. In particular, while the top 3 European hubs (CDG, FRA and AMS) still have the highest total connectivity level, the hub connectivity of Abu Dhabi, Doha and Dubai respectively grew by +1,913%, 1,861% and 485% between 2004 and 2014. Istanbul-Ataturk, Moscow-Domodedovo and Moscow-Sheremetyevo are the only European hubs showing similar growth levels (+1,222%, +774% and +422%). The landscape is changing with the EU losing significant market share as global hub for inter-continental flight connections.

Finally, it is interesting to observe the level of national connectivity. Annex 4 shows that there is a significant gap between the top 5 EU Member States (Germany, France, the UK, Italy and Spain) and the rest of the EU in the number of routes offered for extra-EU traffic. While the top 5 EU countries offered over 220 routes extra-EU in 2014 each, the others did not reach 130 routes each; the lowest number of routes offered is in Estonia (6 routes). This way the top 5 countries together offered 63% more routes in 2014 than the other 24 countries

¹³⁵ Case AT.39595 – Continental/United/Lufthansa/Air Canada; Case COMP/39596 – British Airways/American Airlines/Iberia; Case AT.39964 – Air France-KLM/Alitalia/Delta.

¹³⁶ Airport Council International-Europe's Airport Industry Connectivity Report 2015.

together, clearly showing which countries offer hub solutions. Germany is the best connected country, followed by the UK and France. Among the countries neighbouring the EU, Turkey is the best connected one, followed by Switzerland and Russia.

3.4 Connectivity gaps

Analyses of the different components of airport connectivity (direct, indirect, onward and hub connectivity) show that there is a shift in the balance as regards the connectivity outreach between EU and non-EU/non-European airports, with the latter benefitting the most. The rise of strong competitors in the Gulf countries and Turkey is linked to the shift of the world's economic centre of gravity towards the East. The favourable geographical position of these countries as intermediaries between major markets coupled with decisions by those countries to grow their aviation sectors as a key element of their economic development policies enables them to tap into the rapid economic growth of Asia.

As pointed out by the UK Airports Commission's interim report on airport capacity in London and the South East of England, if for some segments of the transfer market, this seems to be in part inevitable, there are, however, market segments in which the EU hubs can compete more effectively¹³⁷. The report also found that "geography is not the only factor that determines the location of international hub airports. The availability of suitable infrastructure, the nature of economic, fiscal and regulatory regimes in different countries, and historic, cultural and trading links all play a part". Finally, airport connectivity is also unevenly spread across Europe which may have a clear competitive disadvantage for less connected countries and ultimately for Europe as a whole.

Considering the ways connectivity has recently developed and bearing in mind the high level of correlation between connectivity and growth, the Commission's services are of the opinion that it is important to monitor how the EU is performing in terms of connectivity including identifying any possible connectivity gaps.

3.5 Facilitating Member States' action for regional connectivity

Public service obligations constitute an exception to the principle of a free market in air transport. Regulation 1008/2008 (Articles 16 to 18) recognises that they are a legitimate tool to ensure territorial cohesion and economic and social development in remote regions or islands. Regulation 1008/2008 sets the conditions to prevent possible abuses.

There are currently 173 PSO routes in Europe, all located in eleven Member States (Cyprus, Estonia, Finland, France, Greece, Ireland, Italy, Portugal, Spain, Sweden and the UK). France has the largest number (42), with some 5.7 million passengers annually, meaning every fifth domestic passenger is travelling on a PSO route. In Ireland the share of PSOs in the domestic traffic is approximately 70%. PSO routes are mostly domestic routes with only a few European routes (5). 135 are subsidized by the public authorities and the amount of subsidies spent yearly to operate these routes is estimated at €330 million.

A Fitness check of Regulation 1008/2008¹³⁸ conducted by the Commission in 2011-2013 considered PSOs rules as fit for purpose i.e. ensure connectivity when the market does not deliver it. Recommendations were made by

¹³⁷The report is available here: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/271231/airports-commission-interim-report.pdf - point 2.24. These include routes from European cities to a wide range of long-haul destinations and between the east coast of the US and the Far East (where no direct route is available). An example: the distance from Boston to Shanghai is nearly 20% further via Dubai than via London.

¹³⁸ http://ec.europa.eu/transport/modes/air/internal_market/fitness_check_en.htm

stakeholders and Member States to enhance cooperation between national authorities and the EU, and ensure a good articulation between state aid rules and PSO rules including by issuing possible guidance.

Practical steps were taken to achieve that. The Commission created an up-to-date network of PSO contacts; organised meetings of the Market Access Committee under Regulation 1008/2008 where Commission's services made a consolidated presentation on PSOs and where MS exchanged their own practical experience; prepared a simple notification form which is now used by authorities to submit PSOs. Commission's services alert MS ex-ante when they see problems. A new database allows the services to retrieve consolidated data on PSOs across Europe.

The 2015 public consultation did not show that the existing PSO mechanism should be amended. The majority (53%) of the respondents had no opinion or were not sure whether PSO is fit for purpose. However, almost half (46%) of those who expressed their opinion on PSO acknowledged that the current mechanism is fit for purpose while 34% would like to see the PSO mechanism further expanded with only 20% of replies stating that the PSO mechanism should be further restricted.

The three most popular actions or initiatives for those willing to facilitate the introduction of PSOs under current regime were (i) facilitation of application of air carriers for PSOs (ii) wider publicity for PSOs and tenders and (iii) clarification of rules and procedures. On contrary, the three most popular ways to restrict the use of the existing PSO mechanism found in the public consultation were (i) introducing stricter conditions and control mechanisms to ensure that PSOs are established only when necessary (ii) limiting the PSOs to islands and (iii) allowing PSOs only if the market remains open (in total these three represent 44% of the replies for this question). It can be noted that 11% of replies proposing restrictions of current PSO regime were in favour of abolishing the whole PSO system.

At a meeting with national experts held in September 2015¹³⁹ on the application of the EU legislation on access for Community air carriers to intra-Community air routes, the Commission's services mentioned the possibility that Commission guidance on PSOs may be considered, taking into account past practice where applicable. Member States agreed that such guidelines could bring transparency, consistency and clarity to EU airlines, Member States and regional authorities and administrations. This position corresponded to opinions voiced during prior bilateral exchanges with national and local authorities.

3.6 Promoting international connectivity to the benefit of European consumers and businesses

The EU Single Aviation Market: lessons learned

Europe strongly favours competition. This has been a fundamental lesson from the success story of the EU single aviation market, which was built precisely on competition. The EU air transport market is not only open for competition among EU carriers. It is also widely open for foreign carriers. Also, the EU has some of the world's most liberal rules for foreign investment in EU airlines – and foreign partners take advantage of those opportunities without necessarily offering reciprocity. However, these foreign investments have to comply with the applicable EU rules.

As seen in Chart 1, open markets have proven to be the appropriate basis for developing our international aviation relations in an increasingly liberalised and globalised aviation market. The EU's own internal aviation market has successfully reconciled market liberalisation and the application of rules preserving fair competition. One conclusion is that an open market delivers its full benefits only if combined with such common rules, with which all play along.

¹³⁹ <http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetail&groupID=3118>

The EU's External Aviation Policy – a state of play

Over the past 10 years, the EU's external aviation policy has achieved significant results, enabling the EU to become an important and recognised player in global aviation with EU-level comprehensive air services agreements with key partners such as the US and Canada and aviation safety agreements with the US, Canada and Brazil. This has created tangible economic benefits for consumers and new opportunities for EU industry.

Solid progress has been made in developing a wider "Common Aviation Area" with our neighbours to the South, South-East and East of the EU based on a parallel process of market opening and regulatory convergence towards EU aviation regulations. Since 2006, the EU has signed comprehensive aviation agreements with the Western Balkan countries, Morocco, Georgia, Jordan, Moldova and Israel. An agreement is expected soon to be signed with Ukraine which is another significant achievement with an important partner with a large market potential. Negotiations are ongoing with Tunisia, have been opened with Azerbaijan and Lebanon and should also soon start with Armenia.

In September 2012, the Commission issued a Communication on the EU's external aviation policy¹⁴⁰ which took stock of progress made in the EU's external aviation policy of the past decade and the new challenges in global aviation and it proposed a much more coordinated European approach which was largely endorsed by the Council the European Parliament and the EESC.

To remain competitive, it is of course first and foremost for the EU's airlines to continue to adapt their products and business models to the prevailing market conditions. However, it is equally important that: (i) EU carriers are able to benefit from access to key growth markets and (ii) that market access is based on reciprocal fair and open competition ensured by a regulatory framework that promotes EU standards and ensures a level playing field. Experience from the above EU-level agreements has shown that these objectives can best be achieved by the EU negotiating comprehensive aviation agreements. Insofar as EU Member States enter into bilateral negotiations and agreements, the above mentioned objectives can only be reached if they are systematically being taken into account in this context, which suggest a very close cooperation between Member States and the European Commission.

The "normalisation" of international air transport through liberalisation combined with regulatory convergence safeguarding open and fair competition at bilateral and multilateral (regional and global) levels would bring further benefits. Furthermore, an effective instrument against unfair practices could safeguard fair competition in international air transport. Finally, a stronger role of the EU regarding the negotiation (as well as the possible suspension) of traffic rights can overall strengthen the EU in global aviation and can prevent divide and rule tactics by third countries.

In line with the 2012 Commission's Communication on the EU's External Aviation Policy and the respective Council conclusions, the Commission's services are of the opinion that the following ongoing actions would promote international connectivity to the benefit of European consumers and businesses:

- Completion of the process of amending bilateral air services agreements between EU Member States and third countries with a view to bring them into conformity with EU law (notably by replacing the concept of national designation with EU designation): more than 120 countries have recognised this principle by now, but in relation to a number of countries including Russia, South Africa, Nigeria and India this is yet to be ensured.

¹⁴⁰ [http://ec.europa.eu/transport/modes/air/international_aviation/external_aviation_policy/doc/comm\(2012\)556_en.pdf](http://ec.europa.eu/transport/modes/air/international_aviation/external_aviation_policy/doc/comm(2012)556_en.pdf)

- Ensuring timely ratification and full implementation of the existing comprehensive air services agreements and aviation safety agreements, including regulatory convergence/harmonisation which is an important element of ensuring a level playing field.
- Creating new momentum in negotiations with countries in the European neighbourhood and finalise/negotiate agreements with Tunisia, Azerbaijan, Armenia and Lebanon.

In line with the 2012 Communication on the EU's External Aviation Policy and the respective Council conclusions, the Commission is in the process of finalising the on-going negotiations with Brazil. The aim is also to include robust provisions safeguarding fair and open competition.

Brazil, ASEAN, China, Turkey, the GCC (Gulf Cooperation Council) States – Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates (deepening of the EU-GCC Aviation Dialogue by moving towards comprehensive agreements) are important aviation markets for the EU, many of which are fast growing and with which the EU already is engaged in aviation relations of differing degrees.

EU aviation relations with the above countries, many of which are among the EU's key strategic trading partners, are today based on a patchwork of different bilateral air services agreements between (some) individual EU Member States and the respective partner countries. Statistical analysis and various studies have demonstrated significant economic and other benefits from negotiating EU-level agreements with these countries.¹⁴¹

As the 2012 Communication on the EU's External Aviation Policy and the respective Council conclusions stated, the Commission, based on its assessment on the impact and the options considered, will present a proposal to revise or replace "Regulation 868/2004 concerning protection against subsidisation and unfair pricing practices causing injury to EU carriers in the supply of air services from non-EU countries" in order to develop a more effective instrument to safeguard fair competition and improve enforcement.

In cooperation with FPI, DEVCO and other Commission services, aviation cooperation and technical assistance projects are being implemented in China, ASEAN, South Asia or Africa. In September 2015, the first aviation project under the FPI Partnership Instrument was launched to deepen the aviation partnership with China and advance EU aviation interests.

The 2012 Communication on the EU's External Aviation Policy and the respective Council conclusions are witness of a political will within the EU to continue to actively enhance at international level the "normalisation" (development of fair and open competition, elimination of ownership and control limitations, and liberalisation) of international air transport and also the promotion of EU values, standards and solutions.

4. The profitability of the EU aviation value chain

In Europe, the profitability of the different parts of the sector is mixed. Whilst some airlines, in particular some former "flag carriers" continue to struggle with problems, other airlines are doing quite well, particularly in the low cost sector. Furthermore, whilst large airports are profitable and offer sustainable financial returns to their investors, smaller airports struggle to make money. The European airline industry currently has highest breakeven load factors among all other world regions and overall financial performance remains mixed. Among

¹⁴¹ See Chart 1; SDG, Study on the impact of opening aviation markets between the EU and a number of key partner countries, 2015; SDG, Study on the Economic Benefits of Opening Aviation Markets between the EU and Mexico, 2015; SDG, Study on the Economic Benefits of Opening Aviation Markets between the EU and ASEAN, 2014; Copenhagen Economics, Study on the Economic Benefits of a Common Aviation Area Agreement between the EU and Republic of Turkey, 2013; SDG, Study on the economic benefit of a Common Aviation Area Agreement between the EU and the Republic of Armenia, 2012; Booz&Co, Development of the EU's Future External Aviation Policy, 2012; Booz&Co, The Conditions for, possible Geographic Scope and Economic Benefits of Opening Aviation Markets between the EU and a Regional Group of Countries in Asia, 2009.

carriers there is still a significant unit cost gap between FSCs and LCCs, in spite of moves from both to replicate elements of the other's business model¹⁴². It is generally considered that the EU's three major international airline groups, IAG, AF-KLM and the LH-Group, have led to some consolidation of Europe's airline industry but consolidation of the airline industry, compared to other industries, has generally been limited by factors including *inter alia* persisting global restrictions on market access and ownership and control.¹⁴³

4.1 Promoting market access for EU airlines

Air transport is a capital and cost intensive industry. It is also a highly regulated industry with a number of very important barriers worldwide i.e. barriers to access markets, to access different sources of investments (notably foreign investment) and to merge and create large fully integrated airline groups. It is hard to explain to a passenger boarding an airplane for an intercontinental flight that there is no 'freedom of the air', and that her/his flight is the result of a highly-complex regulatory regime. The international aviation regulatory system remains built on the foundations that airlines are national. Traffic rights are administered between States through thousands of air services agreements.

In order to offer the best possible network connectivity to their customers despite regulatory impediments, airlines have built specific cooperation (code-shares, alliances, joint ventures), but hurdles remain.

The EU system is profoundly different from the international system in that it has successfully removed all these obstacles within the EU/EFTA region. It can be seen as an 'anomaly' in international aviation or as a model to follow since it is the only region in the world to have achieved that. There is no traffic rights limitation within Europe for EU airlines as long as they have an EU licence. Airlines can fly wherever they want to serve the needs of passengers in Europe. There is no limit for EU investment meaning EU investors can invest in any EU airline. EU airlines can merge among themselves, subject to applicable EU competition rules, and have done so. The EU has also sought recognition from third countries that its airlines are European, and not national and that bilateral air services agreements should be corrected accordingly. The EU has tried in a way to 'normalise' the aviation sector, to make it more similar to other European economic sectors and subject to the same economic discipline and principles. However, many limits persist including a restriction on ownership and control of EU airlines – which is a regulatory obstacle to global consolidation possible in other economic sectors and other parts of the aviation sector such as airports, manufacturing industry or auxiliary industry.

Except for Chile, all countries in the world deliver and maintain an AOC (safety certificate) and a licence only to airlines that are being held by nationals or companies of this country. The EU abolished this ownership and control requirement between its EU/EFTA members, but not for non-EU/EFTA ('foreign') investors. Thus, Regulation 1008/2008 obliges Member States to verify - when issuing a licence to an airline - whether foreign investment is limited to 49% and whether effective control remains with nationals of EU/EFTA.

Relaxation of ownership and control rules through bilateral agreement on the basis of reciprocity of chosen partners has not delivered tangible results thus far. At the same time, many airlines in Europe are in dire need to find investors, and foreign investment is taking place, flirting with the limits of what is acceptable under Regulation 1008/2008. To date, the Commission has examined or is examining around 15 cases related to ownership and control of EU airlines. At the same time, one should note that apart from a certain number of recent mergers (i.e. IAG/Aer Lingus, Lufthansa/Brussels Airlines, Lufthansa/Austrian Airlines, British Airways

¹⁴² <http://centreforaviation.com/analysis/who-has-the-right-model-for-european-aviation-pan-european-airlines-lead-but-models-vary-225831>

¹⁴³ <http://centreforaviation.com/analysis/who-has-the-right-model-for-european-aviation-pan-european-airlines-lead-but-models-vary-225831>

/Bmi, Air France/Cityjet and Ryanair/Air Lingus) there has not been a significant appetite for European network carriers or low cost carriers or other investors from economic sectors to take over smaller carriers as in the USA, where the airline ownership is much more concentrated.

The public consultation showed that 45% of the respondents were of the opinion that some kind of relaxation would be beneficial to the competitiveness of EU aviation; 9% supported the idea of a restriction of current rules including some airports, airlines and five workers' associations; the remainder were of the opinion that the current rules should be maintained or did not have an opinion on the matter. If not considering those with no opinion (30%), the large majority (65%) of the respondents would like to see some kind of relaxation of current rules, be on the basis of reciprocity (53%) or on unilateral basis (12%).

The option of a relaxation based on reciprocity was shared among several European legacy carriers and regional carriers but also by 9 Civil Aviation Authorities, 9 trade associations and a good number of large airports. The reasons for reciprocal opening of the market were mainly that liberalisation of ownership and control would allow all EU-based airlines, irrespective of the nationality of their owners, to operate under the same regulatory framework, thereby preserving jobs in the EU. In terms of intra-EU investments, there was a call in a public consultation for an evolution of EU competition policy to favour consolidation, while safeguarding traffic rights of individual airlines.

Those who wished relaxation on unilateral basis expressed that it would open competition, reduce prices, be more favourable for consumers and increase the financing possibilities of those airlines. Those who opted for tightening current rules argued for maintaining jobs in Europe (7 cockpits and workers' association).

On several occasions (e.g. the Access Market Committee meeting and Expert Group on Aviation Internal Market meeting held in December 2014 and September 2015 respectively¹⁴⁴) the wish has been expressed to receive guidelines on how the requirement of the ownership and control must be assessed. Also, the UK Civil Aviation Authority has organized two meetings (in November 2014 and July 2015) to share best practices in this regard with other Member States.

4.2 Insolvency laws in Europe

European airlines are often said to "suffer" from a competitive disadvantage compared to their US counter-parts based on the assumption that the US airlines benefit from a more advantageous bankruptcy regime (Chapter 11 of the US Code on Reorganisation available to every business in a state of insolvency) which enables them to restructure more efficiently and at less cost¹⁴⁵.

¹⁴⁴ See <http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetail&groupID=3118> and <http://ec.europa.eu/transparency/regcomitology/index.cfm?do=search.documentdetail&DJBX5t37v0FdjgdnUbVU7CNe5lnur4+YpEv9a1iFWsn/Qhs71dMAJ5dvcXCvNIj>

¹⁴⁵ In the US, a company experiencing financial difficulty - or its creditors - can file with the federal bankruptcy court under Chapter 7 or Chapter 11 of the US Bankruptcy Code. In Chapter 7, the business stops operating, and a trustee sells its assets and distributes the proceeds to creditors. In most Chapter 11 cases, the original management continues to run the business as a 'debtor in possession', but all major business decisions must be approved by the bankruptcy court. In most cases, the company will try to develop a plan to return to profitability and compromise with creditors at the same time. If a plan is not developed, the company is liquidated. The rescue plan has to be voted on by the creditors and stockholders, and confirmed by the bankruptcy court. Even if creditors or stockholders reject the plan, the court can still confirm the plan if at least one impaired class of creditors has voted to approve the plan and it concludes that the plan treats objecting creditors and stockholders in classes being "crammed down" fairly. During the rescue, suppliers may be obliged to continue to supply to the company and, under certain circumstances, lenders who provide working capital to the company to finance the process may "leap frog" existing secured creditors if the company does eventually go into liquidation - i.e. they're the first to be repaid out of the assets recovered. A successful Chapter 11 is a restructuring rather than a liquidation.

Business rescue UK vs US, Dispelling the myths of a 'UK Chapter 11'. By Association of Business Recovery Professionals Necessary?

One third of the respondents to the public consultation considered that there is a need for some kind of insolvency protection of airlines in form of continuing operations under special conditions. Another third rejected the idea while 36% had no opinion.

Those who supported insolvency protection did so on the basis of the volatility and seasonality of the aviation sector and advocated mainly some kind of bankruptcy protection to allow restructuring of insolvent airlines (European version of US Chapter 11); others, to a much smaller extent, however, recommended a special regime for social and taxation contributions.

A state of play of insolvency laws in Member States

At national level, many Member States including France¹⁴⁶, Germany¹⁴⁷, Italy¹⁴⁸ and the Netherlands¹⁴⁹ and the UK¹⁵⁰, home of major EU carriers, have some form of restructuring frameworks for companies in financial difficulties in place as part of their horizontal¹⁵¹ insolvency laws. However, national insolvency laws vary greatly. In particular, the way insolvency laws protect the different interests at stake differs and results from various considerations such as history, legal culture, industrial, social and other public policies.

While Regulation 1346/2000 on insolvency proceedings¹⁵² soon to be replaced by Regulation 2015/848 on insolvency proceedings¹⁵³, provides for uniform rules on jurisdiction and applicable law, there has not been any European harmonization of substantive bankruptcy laws. It is only in the context of the post-2008 crisis that a number of EU-level initiatives emerged in this field, which can be considered as a push for more harmonisation and improvement of bankruptcy laws environment in Europe. Bankruptcy law is one of those areas of law where the EU does not have explicit competence but can act to enable the development of the internal market, i.e. where a lack of harmonisation has cross-border impact.

On 15 November 2011, the European Parliament adopted a Resolution on insolvency proceedings¹⁵⁴ calling for a harmonisation of specific aspects of national insolvency law. In the Commission's Communication on The Single Market Act II of 3 October 2012¹⁵⁵, the Commission undertook as a key action to modernise the Union insolvency rules in order to facilitate the survival of businesses and present a second chance to entrepreneurs. In the context of the European semester, the Commission made recommendations to a number of Member States to reform their national insolvency laws as a way to facilitate economic recovery. The Commission's Communication on A new approach to business failure and insolvency of 12 December 2012¹⁵⁶ highlighted certain areas where differences between domestic insolvency laws may hamper the establishment of an efficient internal market.

¹⁴⁶ Mandat ad hoc, conciliation. Procedure de sauvegarde.

¹⁴⁷ The protective shield procedure.

¹⁴⁸ Piani di risanamento attestati. Concordato preventivo.

¹⁴⁹ The notion of a silent trustee.

¹⁵⁰ Company Voluntary Arrangements.

¹⁵¹ These insolvency legislative frameworks apply to all companies and are not specific to airlines.

¹⁵² Council regulation (EC) No 1346/2000 of 29 May 2000 on insolvency proceedings

¹⁵³ Regulation 2015/848 on insolvency proceedings, which will apply as from 26 June 2017, and which takes into account developments in the insolvency laws of the Member States that aim to keep afloat, rather than liquidating, undertakings in difficulty.

¹⁵⁴ European Parliament Resolution of 15 November 2011 with recommendations to the Commission on insolvency proceedings in the context of EU company law, P7_TA (2011) 0484. See also two studies for the EP: 'Harmonisation of insolvency law at EU level', European Parliament 2010, PE 419.633, followed by 'Harmonisation of insolvency law at EU level with respect to opening of proceedings, claims filing and verification and reorganisation plans', EP 2011, PE 432.766

¹⁵⁵ COM(2012) 573 final

¹⁵⁶ COM(2012) 742 final

Based on this Communication, on 12 March 2014, the Commission adopted a Recommendation on A new approach to business failure and insolvency¹⁵⁷. The starting point of the recommendation was that "many European restructuring frameworks are still inflexible, costly, and value destructive. Insolvency systems in some Member States often channel viable businesses towards liquidation. An effective insolvency law should be able to liquidate speedily and efficiently unviable firms and restructure viable ones in order to enable such firms to continue operating and to maximise the value received by creditors, shareholders, employees, tax authorities, and other parties concerned."¹⁵⁸

The Recommendation, which is not specific to the air transport sector, suggests minimum standards for national pre-insolvency frameworks to be developed. However, since the Recommendation is a non-binding instrument, the minima are not mandatory.

In the Recommendation, debtors have access to a framework that allows them to restructure their business at an early stage with the objective of preventing insolvency (so-called preventive restructuring framework). Debtors should keep control over the day-to-day operations, be able to request a temporary stay of individual enforcement actions and have access to new financing in this period. The process should be flexible so that more steps can be taken out-of-court. The temporary stay means that, during a certain period of time, creditors cannot enforce their claims and thus bring the company in insolvency. The Commission recommends that this period not exceed 4 months, extendable to a maximum of 12 months. Any preventive restructuring framework should be based on a restructuring plan, which could include partial write-offs or other change of conditions vis-à-vis creditors. Debt restructuring should be possible even if some creditors do not agree, provided of course that there are some safeguards for their protection.

The preventive restructuring framework recommended by the Commission bears certain similarities to the Chapter 11 of the US Code on Reorganisation which has been referred to as a good example to follow in the public consultation. However, a European framework should be more flexible and less formalistic than the referred US system, except maybe for the stay of enforcement which in the US lasts until the restructuring procedure is closed and is automatic. Furthermore, a "European model" of company restructuring should be more in line with the European socio-economic model. In particular, there is a need to safeguard labour law and social security law rights¹⁵⁹.

It is widely recognised that the competitiveness of the EU industry – including the airline industry - can be supported by the ability of businesses to restructure. As in other domains, the objective of competitiveness of indebted airlines needs to be balanced in particular against that of securing a safe environment for investors, suppliers (airports, ground-handlers, aircraft manufacturers) and the objective of safeguarding rights of employees and passengers (all airline creditors).

5. The capacity and performance challenges

Airports together with air traffic management constitute the infrastructure of civil aviation. Combined, they are able to handle safely up to 33,000 flights per day in Europe. Yet European airspace is still fragmented and inefficient, especially if compared to the US system and European airports are predicted to face a capacity

¹⁵⁷ C(2012)1500 final

¹⁵⁸ COMMISSION STAFF WORKING DOCUMENT - IMPACT ASSESSMENT Accompanying the document Commission Recommendation on a New Approach to Business Failure and Insolvency, SWD (2014) 61final

¹⁵⁹ An important feature of Chapter 11, often heavily criticised, is the possibility for the undertaking to write off liabilities stemming from labour and social security law

crunch in the near future. Also, the quality, efficiency and cost of the services offered have become increasingly important to the competitiveness of the industry and give rise to a number of issues.

5.1 Completion of the Single European Sky (SES)

Air traffic management (ATM) ranked first among the five most important areas to improve the competitiveness of the EU aviation industry in the public consultation. In addition to that, the CEOs of Europe's five largest airline groups met collectively earlier in 2015 and agreed notably that the delivering of reliable and efficient airspace is one of the four measures that would support the Commission's objectives of enhancing the competitiveness of the EU air transport industry both at European and international level and supporting growth and jobs across Europe.

In this context, the Single European Sky initiative is unanimously considered as capable of raising capacity, improving safety and cutting costs while minimising aviation's environmental footprint. This was the initial ambition more than a decade ago; yet, the project is still not delivering the expected benefits according to the High Level Goals set in 2005. Although there have been positive developments with the performance scheme and the network functions, progress on airspace reorganisation into Functional Airspace Blocks (FABs) has been slow. The lack of progress on FABs is holding back the full implementation of the project, which in turn generates inefficiencies in the entire European ATM. The economic impact of ATM for airspace users amounts at roughly €13.5 billion per year, including direct costs of about €8.3 billion for the provision of air navigation services and indirect costs of about €5.2 billion for delays and flight inefficiencies¹⁶⁰.

The SES2+ package

Currently the European ATM system is run by over 100 different air navigation service providers (ANSP). Whilst the number of providers is not a problem as such, their levels of interfacing with other providers and their economic performances vary greatly across the network. Also much of the technology used is antiquated. The similarly sized US system is able to handle much more traffic at comparable costs, resulting in a 70% efficiency difference between the US and Europe.

Building on already two sets of measures (SES I and SES II), the SES2+ proposal identified answers to several persistent issues. In particular, SES2+ requires full independence of National Supervisory Authorities from the ANSPs that they are supposed to oversee and supported the authorities through co-operation arrangements at EU level to save resources and increase expertise. This should ensure better safety oversight and allow for more realistic performance targets on service providers by reducing conflicts of interest.

SES2+ strengthens the governance of the performance scheme to shorten the process of target-setting through the advisory procedure and making it more based on latest evidence and focused on airspace users' needs. It also proposes to give ANSP's freedom to organise their support services by separating them from the core services and ensuring proper tendering processes will be used. The cost of support services is currently the biggest single element in the efficiency gap between US and Europe. ANSP governance would also be focused on customer needs by ensuring better consultation.

FABs should have been formed by December 2012 and were intended to be more performance-focused by enabling more flexible variable geometry FABs, focused on performance improvements and based on industrial partnerships to step back from the currently more rigid framework.

¹⁶⁰ Source: Performance Review Body

Also, the Network Manager (which performs some network level services and is currently appointed to be Eurocontrol) could offer new network services. The Network Manager contributes greatly to connectivity by providing operational services across European airspace for all ANSPs. It not only covers the EU, but also has a pan-European dimension incorporating all Eurocontrol Member States.

As explained in Chapter IV, efforts are made to remove overlaps between activities of Eurocontrol and EU institutions and bodies (e.g. EASA), in line with the Agreement of 2012 between the European Union and Eurocontrol providing a framework of enhanced cooperation.

The SES performance scheme: towards the creation of a fully independent Performance Regulator

Air navigation services (ANS) are provided in Europe by monopoly service providers that are in most of the cases fully state-owned. The monopoly service provision and the absence of competition require a strong economic regulation. This economic regulation is established under the SES performance scheme.

The entire system of air navigation service provision is financed through charges paid by airspace users. Thus, ANS have an impact on the competitiveness of airlines. Also, as missing air navigation services capacity may create delays, ANS have an impact on the quality of service airspace user can offer to their clients (passengers and freight customers). ANS have an impact on the environment since longer routes and delays/congestion lead to more emissions (and higher fuel costs for airlines). Most importantly, ANS deliver safety.

All these elements are covered under the SES performance scheme, which was first introduced in 2009 in the SES II legislation. It foresees the setting of Union-wide performance targets for air navigation services for fixed reference periods of 3-5 years in four key performance areas: safety, environment, capacity (delay) and cost-efficiency. Member States at FAB level have to develop performance plans including binding targets at national or FAB level that are consistent with the Union-wide performance targets¹⁶¹.

The second reference period of the SES performance scheme started in 2015 and the process of setting performance targets for all FABs is coming to an end. Some Member States may still be required to take corrective measures. If the Union-wide cost-efficiency targets for RP2 were fully achieved, in 2019 en-route determined costs in real terms (EUR2009) will be around €630 million lower compared to the baseline 2014 costs. This corresponds to an annual reduction of 2.1%.

Although progress in terms of ATM performance improvements has been made during the first reference period, the available figures show that more efforts are needed to reach a position, in terms of efficiency and quality of service, similar to other regions of the world. As indicated above, the sector is characterised by high air navigation services unit costs. Airspace users pay annually some €10.5 billion for ANS (user charges, delay costs and flight-inefficiencies). Unit costs are still nearly 50% above those in the United States. These high costs are mainly driven by fragmentation, old technology, labour and social issues.

¹⁶¹ Union-wide targets for the second reference period (RP2, 2015-2019) were set in 2014 by Commission Decision and are as following. Union-wide targets are set on the level of effectiveness of safety management (EoSM) and the application of the severity classification based on the risk analysis tool (RAT) methodology. Union-wide targets in the key performance area of environment are set against the baseline of the performance levels achieved in 2012. In 2019 a value of 2.6 % for the average horizontal en route flight efficiency of the actual trajectory and 4.1 % for the average horizontal en route flight efficiency of the last filed flight plan trajectory is to be achieved. the Union-wide target key performance area of capacity is set at 0.5 minute en-route ATFM delay per flight for each year of RP2. Finally, the Union-wide target key performance area of cost-efficiency is a set of five en-route determined unit rates expressed in €2009 per service unit: €56.64 in 2015, €54.95 in 2016, €52.98 in 2017, €51.00 in 2018 and €49.10 in 2019. This corresponds to an average annual reduction of unit costs by -3.3% per year.

High ANS costs have a negative impact on the competitiveness of European airspace users and eventually contribute to higher fares for the passenger. Depending on the business model, the direct cost for air navigation services represent between 6 and 20% of the total operating costs, excluding fuel, of airlines. As traffic grows, this will have a negative impact on delays, especially if infrastructure is not modernised and may also create a shortage in air traffic controller staff. A key area of concern is also the availability of sufficient capacity in the South-East area of Europe where continued financial impacts on ATM budgets will result in delays because of shortage of controllers, and lack of investment on equipage and restructuring of service provision.

5.2 Airport capacity: revision of the Slot Regulation and role of the Airport Observatory

The public consultation showed that airport capacity is a matter of concern for the EU industry. For 60% of the respondents (over 50 responses in total), the EU should intensify efforts in order to identify and implement measures to mitigate the effects of a capacity crunch at EU airports. Regarding the actions to be taken, approximately one third of the respondents considered that it would be important to better identify the airport capacity hotspots, one third that it would be important to benchmark the progress made in addressing airport capacity hotspots, and one third made other proposals.

A better use of existing capacity remains of the utmost importance and can be achieved through a mix of measures including a better balance between economic and environmental factors, a revised slot allocation system, the use of non-congested airports, the use of Airport Collaborative Decision Making (A-CDM) and other ATM solutions, such as performance based navigation, the implementation of the ICAO balanced approach when it comes to noise and the analysis of (excessive) environmental restrictions in place (e.g. curfews).

In general, new infrastructure is welcome if based on market demand. The affordability of new infrastructure should also be addressed. Some of the respondents called for a comprehensive infrastructure / airport capacity strategy; for others, the EU has a role to play in areas such as setting targets, encouraging/urging national strategies incorporating all modes, promulgating best practices/developing new standards where relevant, providing access to financing. A couple of respondents openly supported the work of the European Observatory on airport capacity and quality (hereinafter 'the Airport Observatory'), which according to them should be retained and provided with enhanced resources. Good surface access to airports and between airports and effective inter-modality also appear as important. For a couple of respondents, encouraging modal shift for short to medium journeys would free up capacity and is a preferred option. Finally, digitalisation of the entire transport chain should be pursued, as it is further depicted in Chapter V.

It is true that the situation in Europe from an airport capacity perspective is a mixed one: at certain locations there is overcapacity, whilst in others there is a lack of capacity. The European Economic and Social Committee stated in its 2014 exploratory opinion on "Airport capacity in the EU"¹⁶² that Europe suffers from a problem of misplaced capacity i.e. a mismatch between where capacity is available and where demand is present. The issue has been addressed recently in a Court of Auditors' special report¹⁶³; before that, it has been taken into account, in particular, by the new frameworks for cohesion¹⁶⁴ and TEN-T¹⁶⁵ policies and the new guidelines for State aid to airports and airlines¹⁶⁶.

¹⁶² European Economic and Social Committee, Airport capacity in the EU (Exploratory opinion at the request of the European Commission), 10 December 2014

¹⁶³ European Court of Auditors, Special Report No 21/2014: EU-funded airport infrastructures: poor value for money, 16 December 2014

¹⁶⁴ See in particular Regulation (EU) No 1301/2013 of the European Parliament and of the Council of 17 December 2013 on the European Regional Development Fund and on specific provisions concerning the Investment for growth and jobs goal and repealing Regulation (EC) No 1080/2006

As the Airport Observatory states in its 2015 report on "Airport capacity in the EU: a strategic perspective"¹⁶⁷, "where capacity is in short supply, it should be noted that capacity shortages at major hub airports impact not only those airports and the traffic between them, but also the connectivity and resilience of airports of all sizes throughout the network. For this reason, local capacity constraints are a cause of concern at supra-national and EU level".

The Commission has been working on these issues since the publication of the first Eurocontrol Challenges of Growth study in 2004. Since then, it has addressed the issue in the (first) Community Observatory on airport capacity (2008-2013); in its 2011 proposal for a revised Slot Regulation (currently, there are 84 coordinated airports in the EU) and its accompanying Communication; in the (second) European Observatory on airport capacity and quality re-launched in March 2014 following the Airport package and Eurocontrol latest Challenges of Growth 2013 study (hereinafter CG2013)¹⁶⁸.

CG2013 confirmed and reiterated the airport capacity issue identified in all previous studies. Two years later, the most-likely forecast scenario of CG2013 still appears to be the most likely. Today, more than 9 million flights cross the European airspace. We could have 16 million flights by 2035. In reality, we will only have 14 million if no counter action is taken. Nearly two million flights will not be accommodated within the plans airports have reported. This is equivalent to 12% of total demand i.e. an estimated 120 million passengers unable to fly (there and back trip). Numerically, airport plans are at least nine runways short. Turkey and the UK are predicted to have the most unaccommodated demand in the most-likely forecast scenario¹⁶⁹.

In addition (meaning even after unaccommodated demand is removed), there is a second important effect of operating at or near capacity: delay. In CG2013 most-likely scenario, there will be more than 20 airports operating at 80% or more of capacity for 6 or more hours per day. They were just three in 2012. This will move airport-related delay from around 1 minute/flight to 5-6 minutes in 2035. Other classes of delay (airline or government) were not modelled for this study. Finally, CG2013 modelled seven ways to mitigate the effects of airport congestion: the best solution appeared to be a combination of options (High Speed Train plus secondary airports plus schedule smoothing = 42% reduction in accommodated demand = 50 million passengers able to fly). The study concluded that new infrastructure will inevitably need to be part of the bridge over the capacity gap. Also, even in regions where expansion is currently possible, the difficulty will increase as the population grows and becomes more prosperous.

Upon request of the Commission, the issue of the economic cost of not being able to accommodate future demand for travel at EU-28 level was addressed by the Airport Observatory. Although there is no 'silver bullet' approach which completely and indisputably quantifies such cost, and considering that it was not possible for the Observatory to quantify the adverse impacts associated with airport related activities (noise), due to the lack of appropriate methodology at EU level, figures considering the foregone direct, indirect and induced benefits would be as follows (two different estimates¹⁷⁰): according to the Oxford Economics approach prepared for Air

¹⁶⁵ Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU Text with EEA relevance, and Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010 Text with EEA relevance

¹⁶⁶ Communication from the Commission — Guidelines on State aid to airports and airlines, 2014/C 99/03

¹⁶⁷ The report "Airport capacity in the EU: a strategic perspective" is available on DG MOVE website

¹⁶⁸ <https://www.eurocontrol.int/articles/challenges-growth>

¹⁶⁹ In terms of runway movements, this would mean more than 250,000 unaccommodated runway movements in the UK by 2035; same for the Netherlands, followed by Germany and Belgium/Luxembourg with unaccommodated runway movements between 150,000 and 250,000; France is set to have less than 50,000 unaccommodated runway movements by 2035)

¹⁷⁰ The report "Economic impact of unaccommodated demand and environmental variables influencing airport capacity" is available on DG MOVE website. The results differ since the InterVISTAS approach does not consider tourism, while the Oxford Economics

Transport Action Group (ATAG): a total of 818,000 fewer jobs by 2035 and an annual contribution to GDP lower by €52 billion; according to the InterVISTAS approach prepared for ACI Europe: a total of 434,000 fewer jobs by 2035 and an annual contribution to GDP lower by €28 billion¹⁷¹

The Airport Observatory also addressed the issue of delay to air transport in Europe and one of the conclusion was that further work would be needed to develop a cost factor to delay addressing perspectives of different stakeholders¹⁷².

As regards global competition, last year, Istanbul Ataturk Airport's traffic grew by 10.6% to 56.9 million passengers per annum (mppa) making it the fourth busiest European airport, ahead of Amsterdam (+4.6%, 55 mppa) and just behind Frankfurt (+2.6%, 59.6 mppa). Booming demand there and at Istanbul's secondary Sabiha Gokcen airport – where last year traffic grew by an impressive 25.4% to 23.5 mppa – has led Turkey to award construction contracts for an all-new six-runway airport to be built on a greenfield site 35 km north of Istanbul – referred to as 'Istanbul Grand'¹⁷³.

While Istanbul and Dubai compete for the title of world's largest airport, China unsurprisingly leads the field in national airport construction with a total of 56 airports currently undergoing expansion. Russia is another country where airport infrastructure is receiving funding, especially at Moscow. In the US, the FAA has just re-assessed the country's airport capacity needs for 2020 and 2030. All in all, as the Airport Observatory states in its report on "Airport Strategic planning", the FAA work demonstrates that through its role as a Federal Agency for the US Government and as the operator of the US aviation system, it is able to centralise information and play a leading role in airport planning (and funding).

Europe has at its disposal an already well-developed airport network to rely upon. In the future, alongside some new infrastructure, the issue will be how to make best use of this network. On this basis, it is of the utmost importance to complete the revision of the Slot Regulation in order to favour the best possible use of our busiest airports. The changes proposed will allow for medium-to-long-term benefits to the European economy and society (24 million additional passengers/year with economic and social benefits linked to that).

Also, the Airport Observatory has recommended undertaking new actions as to airport strategic planning¹⁷⁴. In particular, it has recommended considering airports no longer in isolation but as part of an overall aviation system by expanding the aviation network concept to embrace all airport and airline operations as well as the underpinning air traffic management system.

More specifically, it has identified the need to ensure that airport strategic planning frameworks are developed in each Member State (which is not the case today) and that Master Plans are drawn up for key airports and in each Member State in accordance with common best practice approaches to master planning to be identified at

approach does; the InterVISTAS approach does not consider air craft manufacturing and off-airport ANSP or other off-airport related activity in the supply chain, while the Oxford Economics approach does.

¹⁷¹ Higher figures show the foregone catalytic impacts, the lost potential tourism impact and the negative economic welfare impact, however, the more is considered the more there is a risk of having overlapping components.

¹⁷² The report "Delays to air transport in Europe: methods of measuring, reporting and analysing" is available on DG MOVE website.

¹⁷³ This "mega hub" will be able to handle ultimately as many as 150 mppa. Phase 1 is scheduled to be completed end 2017. In addition to that, Dubai International Airport -- which in 2014 overtook Heathrow to become the world's busiest airport for international traffic -- has current landside projects to increase capacity from 69 to 90 mppa by 2020. Around 15 km from Dubai International, the next phase of Al Maktoum International Airport's expansion is set to enable the airport to handle 120 mppa with an option to grow this ultimately to 240 mppa. Less than 150 km from Dubai, Abu Dhabi International Airport has also ongoing landside projects to increase capacity from 20 to 40 mppa while improvements at Qatar's Doha Hamad International Airport should allow the airport to increase capacity from 30 to 53 mppa and ultimately to 65 mppa.

¹⁷⁴ See footnote 160

EU level building on existing recognised international and industry tools such as ICAO Airport Planning Manual and IATA Airport Development Reference Manual, so as to improve quality of such plans and consequently their acceptance. It has identified the need to set up a reporting mechanism for airport capacity at EU level so as to develop a full picture of the issues at stake, and, building on the SES Network Manager, to set up a central repository of EU Airport Master Plans in the Network Manager. Indeed, the group has identified the need to include top-down elements, such as the role for the Network Manager in identifying existing and emerging airport-capacity hotspots and challenging Member States to fill or otherwise manage identified capacity shortfalls. For that to happen, the Network Manager concept and Terms of Reference should be amended to ensure they take a holistic approach to aviation.

5.3 The quality, efficiency and cost challenge at EU airports. The role of the Thessaloniki Forum of Airport Charges Regulators

Performance in the public opinion

Similarly to the availability of appropriate airport infrastructure, where demand is located, the provision of quality and efficient services to people and businesses at EU airports is another important area to look at in the debate over the competitiveness of the EU aviation sector. All questions related to this second topic in the public consultation gave rise to a significant number of comments (over 230 responses in total), some of which were quite detailed.

Starting with the question on airport operational performance, almost half of the respondents (49%) considered that the EU should be doing more to address operational performance of airports; others (24%) considered that the EU should not intervene; the remaining respondents (27%) had no opinion. For those willing to address airport operational performance at EU level (25 responses in total), 26% would like to see the EU benchmarking airport performance, 11% would favour a regulatory approach in this field and 34% would prefer industry-led initiatives. For some of the respondents, all suggested options were equally relevant. One pan-European organization believed that key to improving airport performance is their full integration into the overall aviation network.

Respondents provided views on areas where improvements could be made considering existing EU legislation i.e. airport charges and ground handling. The need for more choice and better value among ground handling providers was mentioned several times, chiefly among airlines or their representative associations. Many of these responses, including those of three Member States/national regulators specifically expressed disappointment at the Commission's withdrawal of its 2011 ground handling proposal which targeted many of the issues raised in these responses. A number of respondents highlighted the need to encourage investment in human capital and the quality improvements that this would bring; two of these mentioned specifically concerns over the rights of staff affected by activity transfers. Most of the airports and their associations cited the importance of allowing airports to control better GH operators active at airport platforms, including the imposition of quality standards/incentive mechanisms by the airport operator. The need to allow integrators the right to self-handle for all GH services was cited by the two express carriers/associations.

Regarding airport charges, the responses were polarised between those of airlines and others. The need for a stronger EU framework to regulate the 'monopolistic' behaviour of airports was cited several times. However, even among the airlines there were differences about the best approach to achieving this. The majority of them supported a general strengthening of the Airport Charges Directive, including for some a wider scope to include smaller airports, and for others the use of the single till system of airport financing at all airports. Some went further by calling for an EU-wide performance scheme for airports. For others, including two budget airline respondents and one regulator, the EU should alternatively seek to ensure that the framework focusses on

airports whose market power (and possibility for this power to be abused) is not adequately addressed by the current Directive. On the other hand, airports stressed the importance of a less rigid framework which would better take into account the market reality in which airports operate and the fact that questions related to airport charges are increasingly just a part of the purely commercial partnership between airports and airlines.

Also, asked whether the SES performance-based approach should be extended to other parts of the value chain, 25% of respondents answered that this approach should not be extended to other areas; 44% were of no opinion; 31% said that indeed the SES performance scheme should be extended to other areas. Out of this 31% (over 50 responses in total), a very large majority of respondents were in favour of covering the setting of airport charges to ensure that airports do not abuse their dominant position. For some of them, the setting of performance targets should cover not only the charges but also the levels of service to ensure that airports have the right incentives. For others, the approach should apply to all the stakeholders who are relevant for the achievement of the SES targets meaning in addition to the ANSPs, the Network Manager, the airlines (especially for public information to passengers, punctuality, treatment of luggage and of claims) and the airports. For some, any move to a performance-based approach on safety issues should be taken with cautious. Other areas mentioned were: ground handling and ground operations (like check-in and transit through terminal), ground equipment, security and environment (CO₂ and noise).

Airport costs

The availability of quality and efficient airport services is crucial if Europe wishes to retain a strong European air transport sector. In particular, airport costs in the EU also have an impact on the international competitiveness of EU airlines vis-à-vis their peers elsewhere due to their relative exposure to European airports. Their peers may enjoy different conditions in their respective home regions where the user may not be expected to pay a similar share of the cost of the airport infrastructure they use. For example, in the US, infrastructure, including security, at larger airports is underwritten at least in part by the state.

Airport charges are a significant part of airlines' total costs, accounting for up to 10% of such costs, according to airport and airline associations. In the light of this, discussions about the value chain in the aviation sector and 'fair returns' often focus upon the issue of airport charges. As illustrated in the general introduction, the Airport Charges Directive¹⁷⁵ lays down minimum requirements in the field of airport charges; it does not say how airport charges are calculated, which is subject to different practices in the Member States. Also, it does not cover the main point of contention between airlines and airports, which concerns the choice of single- or dual-till for the regulation of airport charges. It is recognised that charges at most airports, in particular smaller airports, are not subject to detailed economic regulation and so discussions on the choice of regulatory till are of limited relevance to them. However, a majority of passenger journeys in Europe travel through airports at which some form of airport charges regulation applies¹⁷⁶. Airports have two main groups of activities: aeronautical services they provide to airlines for which airport charges are paid (mainly landing and passenger charges) and commercial activities like airport parking, terminal retail or real estate development around the airport. In a single till system, revenues from aeronautical and commercial activities are combined in one regulatory till. Typically under such a system the regulator then sets out a maximum financial return for the airport (for all of its activities) and the charges to airlines are then set accordingly.

In a dual till system, the airport is allowed to keep the profits from its commercial activities. This essentially means that airport charges have to recover the full cost of the runway and terminal upkeep (apart from terminal

¹⁷⁵ Directive 2009/12/EC.

¹⁷⁶ DG MOVE analysis of Eurostat figures for 2013.

areas used for shops) whereas under single till the surplus from commercial activities serves also to pay for the runway and terminal, which has the effect of lowering the charges paid by airlines. Hybrid systems also exist, which are a ‘halfway house’ whereby the airport is obliged to transfer a part of the non-aeronautical proceeds to the regulatory till.

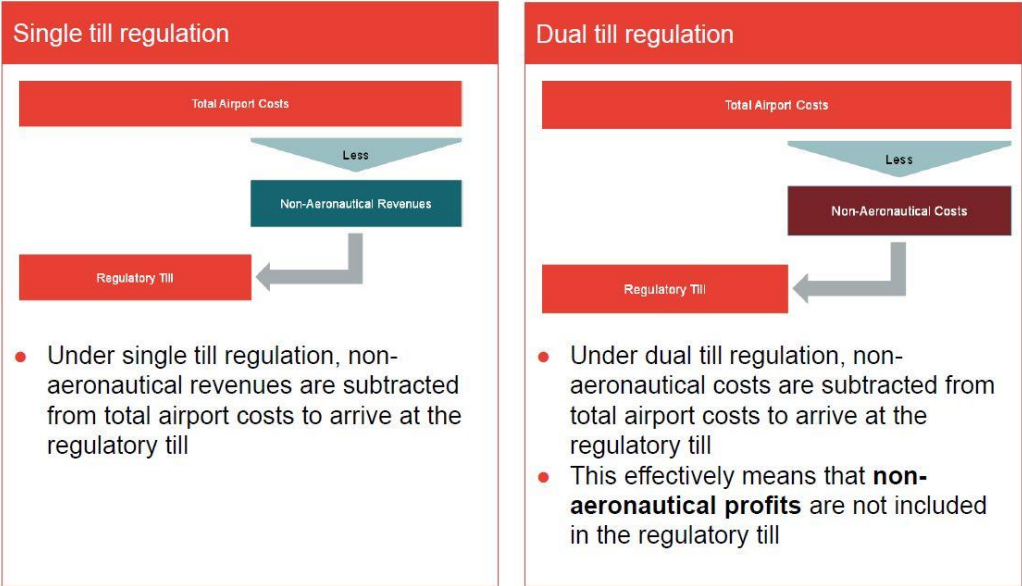


Chart 15 Single and dual till regulation
Source: easyJet/Frontier Economics

Airlines typically prefer the single till, arguing that the airport’s commercial activities are a result of the traffic which airlines bring to the airport and so airlines should also benefit from the profits of such services. Airports generally argue that single till does not provide any incentive for the airport to develop commercial activities and therefore stifles the growth of economic activity at the airport. Directive 2009/12 is neutral on the choice of model and during the negotiations on the Directive in 2007/2008, Member States retained their right to select whichever model they prefer. There is a link between the choice of the dual till, which could be a more attractive model for potential airport investors, and the process of privatising airports.

Although the Directive, which had to be transposed by March 2011, seems to have had some impact in increasing transparency of such charges and improving consultation, it is by no means clear that it has affected the general level of airport charges, in particular at the larger airports, at which the dual-till is the more prevalent model of financing. It is true to say that – in general – larger EU airports are more expensive than their counterparts in other regions of the world (see Annex 5).

The Commission issued a report on 19 May 2014 on the implementation of the Airport Charges Directive. This report stated that the Commission would focus on improving implementation of the current Directive and that it was not (yet) the right time to revise the Directive. The report also signalled the setting up of the Thessaloniki Forum of Airport Charges Regulators with the objective of exchanging best practices among independent supervisory authorities. This body is examining issues such as the determination of an airport’s market power, transparency of airport charges and how to consult effectively on financing for new airport infrastructure.

Stakeholders have expressed different views based on the four years during which the Directive has been in force. Looking further ahead it seems clear that given these different reactions, the Commission should seek to assess where regulatory intervention is most important and the extent to which the regulatory burden in some areas could be lowered. In addition, the work undertaken so far by the Commission indicates that assessing the

degree of market power could be an appropriate means of determining where and whether regulatory intervention is necessary and justified.

Finally, the Commission has been active in ensuring the correct application of Directive 2009/12 by all Member States notably with regard to the independence of the national supervisory authorities.

State aid guidelines

In 2014, the Commission adopted new guidelines on state aid in the aviation sector. These new rules aim to ensure that airports located in regions with a genuine transport need get access to the public funding that they need while also maintaining a level playing field for airports and airlines irrespective of their business models.

The guidelines allow public authorities to support investments into airport infrastructure and equipment as well as, for a transitional period of 10 years, the operating losses of small airports (below 3 million passengers), before they become profitable. Since very small airports with annual traffic of less than 700,000 passengers may face specific difficulties, they may benefit from operating aid to cover losses for a period of 5 years, and the Commission will review their situation to decide whether and for how long they should receive further operating aid.

Under certain conditions, airlines may also receive "start-up aid" that gives them the necessary incentive to create new routes from regional airports, increases the mobility of EU citizens by establishing access points for intra-EU flights and stimulates regional development. As remote regions are handicapped by their poor accessibility, the criteria for granting start-up aid for routes from these regions are more flexible. The guidelines also explain under which circumstances arrangements between the manager of an airport and an airline operating at that airport (typically airport service agreements and marketing services agreements) may deviate from normal market conditions and involve State aid to the airline. If an airline benefits from such State aid, it can be considered compatible with the internal market only under very specific circumstances, for instance when the aid complies with the requirements applying to "start-up aid".

The application of the guidelines is expected to have an effect in particular at smaller airports, where consolidation seems to be likely. Many such airports are loss-making and may currently rely on public support. It should be noted that at such airports a high level of airport charges has not generally been raised as a concern.

Ground handling services

An important element of airlines' costs at airports, but not covered by airport charges, is ground handling services, which are essential for the safe and efficient preparation of aircraft before a flight. Ground handling services include passenger handling, ramp handling, fuelling, mail/cargo services and other services. Under the current Ground handling Directive¹⁷⁷ dating from 1996, airlines have the right to carry out their own ground handling or may choose from at least two suppliers for baggage, ramp handling, fuel and freight handling. For these categories Member States are allowed to limit access to the market to only two suppliers, one of which can be the airport itself.

The 2011 airports package included a ground handling proposal to, among other things, open the market further at larger airports, to a minimum of three suppliers. The Commission's impact assessment had indicated cost savings and an increase in quality which would result from greater competition and the accompanying measures set out in the proposal. However the Commission withdrew the proposal in 2015 before trilogues with the

¹⁷⁷ Council Directive 96/67/EU of 15 October 1996 on access to the groundhandling market at the community airports

Council and Parliament had taken place, on the grounds that final adoption of the proposal was an unlikely prospect.

Taxes and levies

Specific national taxes on aviation are applied in the UK, France, Germany and Austria. Italy has introduced a noise tax in recent years, applied at regional level, and the Catalan region in Spain has recently introduced a tax on NOx emissions at airports within the region.

Airlines (and, indeed airports and other air transport stakeholders) have complained that such taxes harm the competitiveness of the air transport sector with wider economic repercussions for the EU and express concern at the emergence of a patchwork of different taxes in the EU while several NGOs¹⁷⁸ are of the view that fuel taxes could serve to internalise external environmental costs and create incentives to reduce fuel consumption and associated emissions, as this is the case for fuel taxes imposed on other modes of transport. These taxes are not subject to Union harmonisation but they need to comply with Treaty rules, for example on free movement of services, freedom of establishment and State aid rules, and the Commission has acted in the past to ensure such compliance. Fuel used for commercial aviation is in principle exempt from excised duty, subject to the possibility for Member States to tax fuel consumed in domestic and in certain cases intra-EU transport¹⁷⁹. As regards value added tax, the VAT Directive requires the exemption of "the supply of goods for the fuelling and provisioning of aircraft used by airlines operating for reward chiefly in international routes"¹⁸⁰. However, domestic air travel is subject to VAT in the vast majority of Member States.

Security charges

In 2012 ACI Europe estimated that security services provided at airports represented 20% of airports' operating costs and pointed out that Europe is the only region in the world where security receives little or no state funding. Taking into account the need to invest in new technologies for airport security, the resulting cost per passenger can be especially significant at smaller airports. This part is further developed under Chapter III on 'High Standards for public confidence, growth and jobs'.

It should be noted that with respect to the State aid rules, if Member States (at central or regional level) decide to finance activities that normally fall under the responsibility of the State in the exercise of its official powers as a public authority, such as air traffic control, police, customs, firefighting, activities necessary to safeguard civil aviation against acts of unlawful interference, and the investments relating to the infrastructure and equipment necessary to perform those activities, they can do so without being subject to State aid rules if a number of conditions are met. In particular such public financing of non-economic activities must be limited to compensating the costs to which they give rise and must not lead to undue discrimination between airports subject to the same legal order¹⁸¹. Thus, the State aid rules do apply when public authorities relieve undertakings of the costs that are inherent in their economic activities.

¹⁷⁸ In the public consultation to the Aviation Package 2015

¹⁷⁹ According to article 14(1)(b) of Directive 2003/96/EC, Member States must exempt from excise duty "energy products supplied for use as fuel for the purpose of air navigation other than in private pleasure-flying". Article 14(2) of the Directive stipulates as follows: "Member States may limit the scope of the exemptions provided for in paragraph 1(b) [...] to international and intra-Community transport. In addition, where a Member State has entered into a bilateral agreement with another Member State, it may also waive the exemptions provided for in paragraph 1(b) [...]. In such cases, Member States may apply a level of taxation below the minimum level set out in this Directive."

¹⁸⁰ Directive 2006/112/EC

¹⁸¹ See paragraphs 34 to 27 of the Guidelines on State aid to airports and airlines; OJ C 99, 4.4.2015, p.3

CHAPTER III

'HIGH STANDARDS FOR PUBLIC CONFIDENCE, GROWTH AND JOBS'

1. Introduction

The pursuit of high standards has to be an essential pillar of any forward-looking aviation strategy. This is most evident in the areas of safety and security, as only high standards in these key fields can provide the travelling public with the necessary confidence to travel by air.

Having said this, the pursuit of high standards for European aviation provides for much more than confidence: it forms an essential pre-requisite to its global competitiveness. Indeed, just as is the case in many other economic sectors, the internal market, which is based on the pursuit of high standards, is arguably one of Europe's best assets in times of globalisation. For the aviation sector, a strong internal market, underpinned by an effective and efficient regulatory framework also opens up opportunities for businesses to expand successfully on the global market.

Again, this might be most obvious in the areas of aviation safety and security, where high safety and security standards provide an evident competitive edge. But this is equally true for a number of other aspects of aviation, which for this reason are being dealt with in this chapter. The confidence in, and the global competitiveness of European aviation will profit from high standards in areas such as environment and decarbonisation, employment conditions, institutional performance and governance, passenger rights and through the provision of high standards in the way businesses are conducted. If looked upon through the correct angle, each of these areas are key in generating the necessary confidence of the public in the aviation industry, which itself is a key pre-condition for the maximisation of aviation's contribution to Europe's competitiveness.

Because the further development of the EU's safety policy is a prominent pillar of the Aviation Strategy, the subchapter on safety has deliberately been given prominence. The format of this subchapter is also deviating from the way the other aspects are discussed, as one of the aims of this subchapter is to summarize the thinking which underpins the Commission's Proposal to revise the EU's Basic Aviation Safety Regulation 216/2008.

2. Revising the EU aviation safety system

2.1 The safety picture of the EU aviation sector. Regulation 216/2008: lessons learned

Aviation safety is at the centre of the EU's regulatory effort in aviation. Although accidents do happen, Europe has been so far successful in maintaining a high level of safety, and remains, alongside US, the safest region in the world for air passengers. In commercial air transport, the EU/EFTA operated aircrafts have recorded in the last ten years an average fatal accident rate of 1.8 per ten million flights, which is significantly below the worldwide average (Chart 16).

It is anticipated that by 2035 there will be over 14.4 million flights in our airspace (50% more than in 2012). It is necessary that the already low accident rate continues to further decline in proportion to this traffic growth, allowing the EU aviation sector to safely grow in the future and thus to contribute to its competitive edge.

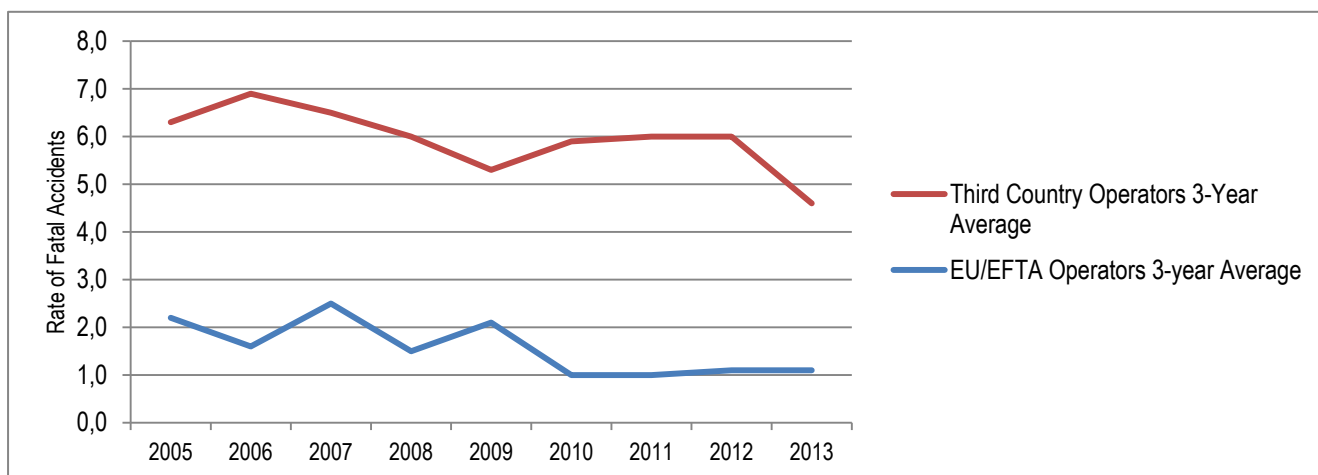


Chart 16 Rate of fatal accidents in EU/EFTA Member States and third country operated scheduled passenger operations, aeroplanes above 2250 kg MTOM, 2004-2013 per 10 million flights

The good safety record must also be put in the context of the regulatory achievements of the past decade. A single regulatory system has been established and covers 32 European States – this is essential given that over 70% of flights in the EU cross national borders. The European Aviation Safety Agency (EASA) has also been established as the EU’s technical agent for aviation safety. In just over 10 years, EASA has developed into one of the leading aviation safety authorities in the world, on a par with the long-reputed U.S. Federal Aviation Administration. It should continue to be supported as the EU’s centre of excellence, with a wide responsibility to manage safety in Europe and to project our high standards throughout the world.

This EU safety system not only contributes to high standards for safety, but also to the level playing field for the industry. Automatic recognition of certificates allows the organisations and personnel to provide services anywhere in the EU and to freely move between jurisdictions, reducing red tape and redundant oversight. Where this is in the best interest of safety and efficiency, certain certificates are now issued by EASA on behalf of all Member States. This is in particular the case for aeronautical products, where the single EASA certificates have proven an enormous asset to Europe's aeronautical industry. This certification activity, which is critical for the industry’s ability to place products on the market, is financed entirely from fees paid by the industry. Provided that a system of objective and verifiable indicators measuring industry workload and the efficiency of the Agency is in place, the Agency's staffing levels should be allowed to fluctuate both up or down in order to meet market demand. It is the Commission’s responsibility to set the levels of fees such that the Agency is able to deliver this service to the industry in a reliable, speedy and cost-efficient manner, while avoiding surpluses or deficits.

The Commission's services have thoroughly reviewed the lessons learned over the last decade from the implementation of the EU aviation safety system and in particular Regulation (EC) No 216/2008, by consulting the Member States, the industry and the wider public; by getting input from independent scientific bodies; by conducting in-house analysis.¹⁸² On this basis, the Commission's services have come to a number of conclusions which are presented in the below section.

2.2 The way forward

The current safety record of the EU is excellent, which is crucial to retaining public confidence and enabling further growth of the EU aviation sector in conditions of strong global competition. In order to achieve the same

¹⁸² Available at <http://ec.europa.eu/transport>

results in a context of traffic growth and increasing complexity of the aviation sector, the system would need to be improved. A similar logic applies to the development of new technologies, such as civil drones or electric aircraft, which will have to be safely integrated.

These improvements will have to be achieved in an economic environment which will continue to exert pressure on the resources of the EU and Member States. Available evidence demonstrates that the growth in size of the industry has, over the last ten years, outpaced the increase in workforce and budget of aviation authorities, which at the same time have not yet significantly changed working methods (Table 6). Some EU aviation authorities experience shortages of resources, while qualification of staff varies across Member States.

Table 6 Evolution of aviation safety resources and workload in the EU

	2003	2008	2013	2003-2013
Resources				
OPS/AIR/FCL National Aviation Authority staff (MS=17)	1 574	1 727 (+10%)	1 659 (-4%)	+5%
National Aviation Authority budget (MS=16)	€439 million	€558 million (+27%)	€530 million (-5%)	+21% / -3% if adjusted for inflation
Workload				
CAT fleet size (MS=22)	3 494	4 127 (+18%)	4 307 (+4%)	+23%
AOC holders (MS=31)	1,221	1,304 (+7%)	1,201 (-8%)	-2%
Pilots (MS= 23)	139 258	176 575 (+27%)	175 383 (-1%)	+26%
FTOs (MS=25)	1 544	2 010 (+30%)	2 047 (+2%)	+33%

One contribution to this objective would be to make better use of resources available in the EU and Member States. This would serve both the safety perspective and the desire to accommodate the growing demand for technically challenging certification and oversight work from the industry. Moreover, it would improve the capabilities to cope with new technologies delivered by SESAR deployment. In the long term, such challenges may be best mastered by way of a transition to a single aviation authority. In a shorter term perspective, it may be more suitable to build an oversight mechanism allowing the national authorities and EASA to work as an integrated 'team' in a single system, and to discharge responsibilities either through in-house resources or by relying on resources available elsewhere in the system. Such an integrated oversight mechanism would allow allocating scarce resources more efficiently and facilitate specialisation of authorities. It would also be beneficial for the industry and in particular multinational operators which would have more possibilities for consolidating approvals held in multiple Member States.

Better use of resources may also result from better regulation. While the present system is effective, it achieves its excellent safety record at a high cost for authorities and the industry, largely linked to the way the sector is regulated, namely through detailed rules setting out certain means to reach a given objective, instead of focussing on the level of safety to be reached. While this situation affects, to a greater or lesser extent, all the sectors, its negative consequences are particularly felt by the SMEs and the General Aviation sector, where for example the increasing costs of operating certified aircraft has contributed to the shift of many pilots towards less regulated, ultralight aircraft. It is notable that the average age of certified General Aviation aircraft is 40 years.¹⁸³ In many Member States the size of the general aviation fleet has been reducing in the past years.¹⁸⁴

¹⁸³ Source: GAMA.

¹⁸⁴ Source: 2014 General Aviation Statistical Databook & 2015 Industry Outlook (GAMA).

A system based on the idea of a proper balance between the level of regulation and the risks posed by the different types of aviation activities requires in the first place that an acceptable hierarchy of risks be fixed. The premise of such system is that it is acceptable to differentiate between the levels of protection that regulation offers to the public, depending on objective criteria such as the environment in which the operation is conducted (e.g. over populated or non-populated areas; in controlled/non-controlled airspace), or the ability of the participants to control risk (e.g. aerial sports or public transportation).

The 'hierarchy of risks' approach would have a number of consequences. More responsibility could be for example given to the General Aviation sector to manage and oversee its activities in line with the EU general aviation roadmap and strategy, while allowing Member States to refocus the scarce resources on protection of commercial air transport. Moreover, Member States would need more flexibility in addressing the risks which are specific to their local operational environments if the functioning of the single aviation market is not affected. The regulation of civil drones, due to the very diverse nature of equipment and its use, would be particularly suited for the application of the hierarchy of risks principles.

The present system is largely based on prescriptive rules controlled through audit-type checks. This approach allowed the EU to achieve the present high safety record but it also has shortcomings. Firstly it may neither be possible nor desirable to regulate all details of aviation operations or aircraft manufacturing techniques. Business models and technologies evolve quickly and overly prescriptive regulations may stifle innovation and add unnecessary cost. Secondly, excessively detailed rules may lead to a culture of administrative compliance rather than a genuine concern for safety. Finally, the limited resources of aviation authorities have to be taken into account. In summary, further regulation and just doing more of what we currently do may not have the greatest effect.

A performance based approach to rulemaking may provide a remedy, where appropriate. This view is broadly shared by the industry and Member States. The EU has already embarked on a transition towards a performance based environment. Under such approach, safety can be measured through indicators and acceptable levels of safety performance are defined, following a dialogue between the regulated and regulators.

However, the effort required to complete the transition to a performance based environment must not be underestimated. In the EU, this transition is additionally complicated by the fact that coordination is needed between national and EU safety management processes. Nevertheless, the approach offers an opportunity for addressing risks which are common to all or at least several Member States and to help them to learn from each other.

The transition to a performance based environment, sketched out above, would include a revision of the EU basic safety regulation. Some provisions of that Regulation may be unnecessarily detailed and their subject matter better suited for lower level regulatory material. Ideally, rules should be technology neutral, forward looking and setting safety objectives in terms of results to be achieved while the means of achieving these objectives are left to the industry. This approach should allow for greater reliance on recognised industry standards and simplified and tailor-made certification procedures leading to shortening the time to market and supporting greater innovation.

At present, various organisations are involved in developing standards in the aerospace sector, with an obvious lack of coordination. Greater reliance on recognized industry standards in the future would require stronger management of this activity with focus on priorities, timely deliveries and transparency of intellectual property rights. While coordination with international partners is necessary for global interoperability, from an EU

industry viewpoint the specificities of the EU regulatory framework can best be taken into account if standardisation takes place at European level.¹⁸⁵ At present, however, the industry does not consider the pace of EU standardisation bodies as corresponding to the fast rhythm of the aerospace work. The Commission, EASA, industry and EU standardisation organisations have engaged in a dialogue with a view to enhancing the efficiency of the aerospace standardisation process, which in turn would contribute to the competitiveness of the EU aviation industry.

A new area where this modern approach to regulation should be applied to the fullest extent is the regulation of unmanned aircraft and unmanned aircraft operations. This is explained in more detail in Chapter V, point 5.

In order for risks to be effectively managed across the EU, a collaborative safety management process is needed, based on the lessons learned from the implementation of the European Plan for Aviation Safety (EPAS)¹⁸⁶. That said, problems that are specific to particular Member States will remain, and cannot be covered by the EPAS as such. Instead, they can only be addressed under Member States' Safety Programmes. Changes that have taken place since 2011 are not reflected in the current European Aviation Safety Programme (EASP), which would need to be updated in order to reflect those changes. Remaining gaps in the safety chain concern in particular ground handling. Safety data regarding this activity show that it is the fourth biggest source of accidents in the EU in the period of the last ten years, with voluntary industry initiatives not bringing fully satisfactory results. Closing these gaps would thus be of clear benefit for safety.

The creation of the EU Single Aviation Market has created unprecedented opportunities for businesses. It has also stimulated the emergence of new business and employment models such as multi-AOC airline consortia or pilots employed through agencies. While available evidence does not indicate that any of the new business models is 'unsafe', it is evident that these developments require further close monitoring. What is also clear is that oversight of multinational organisations or certificate holders moving freely between jurisdictions is more challenging, resource intensive and requires close collaboration between aviation authorities. The EU can support this collaboration by facilitating cooperative oversight. For this purpose, the framework for sharing and pooling resources, referred to above, including European aviation safety inspectors and an EU repository of certificates should be considered as primary tools.

The integrated nature of aviation and the imperative of efficient regulation require consideration of the interfaces between aviation safety and other domains of aviation regulation. Aviation security in particular has many interfaces with safety and the ongoing discussions on the risks posed to aviation by operations over conflict zones and in-flight security which were triggered by the tragic downing of Malaysia Airlines Flight MH17 and the Germanwings Flight 9525 crash have brought the importance of these interfaces to the forefront of public debate. Other examples, where the borderline between safety and security cannot be clearly defined involve cyber-security and aircraft design. Where safety and security risks are addressed by common design features or where there are close interdependencies between technical aspects of safety and security leading to possible trade-offs, these two domains have both to be taken into account at the same time.

2.3 The international dimension of the EU aviation safety system

The global nature of the aviation sector calls for a robust international dimension of the EU aviation safety system.

¹⁸⁵ Independent Review of the European Standardisation System Final report, EY, March 2015

¹⁸⁶ The European Plan for Aviation Safety was previously called the European Aviation Safety Plan.

From an industrial perspective, the international dimension is crucial for the EU aeronautic sector. In 2013, EU manufactured aircraft represented 33% of the worldwide civil fleet (Chart 17),¹⁸⁷ and there is a great potential to further expand the position of the EU industry overseas. The emerging economies will represent over 50% demand for new aircraft over the next twenty years – a market worth over 4 trillion euro.¹⁸⁸ Making EU industry successful overseas contributes to a strong industrial and employment base in the EU. In 2013, the EU aeronautics sector was supporting over 515,000 jobs, and generated a revenue of €138 billion which is an increase of 7 % and 42% respectively since 2008.¹⁸⁹

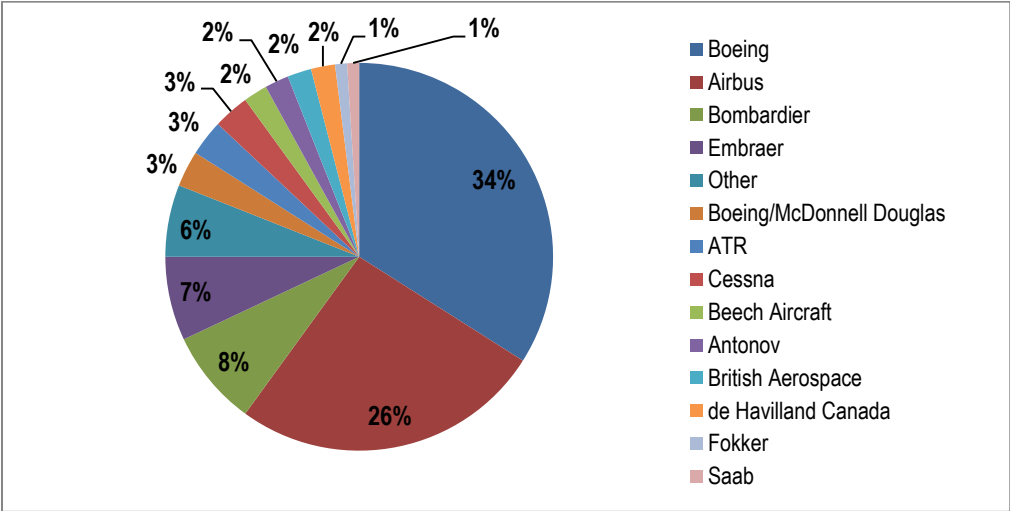


Chart 17 Global fleet breakdown by manufacturer (2013)

To reduce redundant regulatory oversight and promote market access for industry, the EU has already negotiated BASAs with the United States, Canada and Brazil - three markets whose manufacturers make up nearly 60% of worldwide civil fleet.

Past experience also shows that a successful aviation safety policy is an important asset of the EU in international relations. Many of the countries in Asia, Middle East and other regions of the world voluntarily apply EU requirements, which are perceived as representing state-of-the-art. This both enhances safety by promoting uniformity of approaches globally and helps EU industry in positioning itself in markets with familiar regulatory systems. As indicated in the chapter on connectivity, it is expected that in the next twenty years less than 40% of all traffic will be carried by airlines from Europe or North America, as opposed to over 60% at the beginning of the century and 48% still in 2014.¹⁹⁰ This means that the importance of international cooperation, global interoperability and harmonisation will continue to increase, as will the desire of the EU aviation sector to expand its global presence and to compete successfully on international markets. The EU should be ready for these developments by strengthening its voice in ICAO (including through better pooling of all the expertise from many European stakeholders which are active at ICAO), concluding aviation safety agreements with emerging aviation nations such as China or Japan, and have, through EASA, sufficient resources corresponding to market demand to support the EU aeronautical industry in obtaining the necessary foreign certificates.

The pursuit of high standards in safety is also of key importance with regard to foreign airlines operating to the EU or being used by EU citizens, but equally by non-European citizens, when travelling outside of the EU. It is

¹⁸⁷ CAPA fleets database.
¹⁸⁸ Airbus.
¹⁸⁹ ASD.
¹⁹⁰ Airbus, Global Market Forecast 2014-2033.

notable that in the last ten years, the large majority of EU citizens which were fatally injured in aviation accidents, travelled on third country operated aircraft.¹⁹¹ This is where the risk manifests itself most visibly.

The EU has taken strong action to protect its citizens from threats posed by sub-standard operators and to enhance safety globally, by working in concert with international partners, industry and ICAO. When safety is at risk, action can already be taken at the EU level to protect the travelling public. This is notably the case through the EU Air Safety List, by the SAFA programme (Safety Assessment of Foreign Aircraft – a common, EU wide standardised system for ramp inspections), and most recently, by the third country operator authorisations (TCO) through which EASA provides one-stop-shop common safety authorisations to the approximately 700 foreign air carriers wanting to operate to the EU. Together these instruments form an appropriate toolbox at the disposal of the Union to maximally protect passengers from unsafe foreign air carriers. In addition, the EU has already invested over 65 million euro in capacity building and technical cooperation projects in Asia-Pacific, Africa and neighbourhood countries, with further projects worth approximately 20 million euro in the planning.

In this respect, it is noteworthy that these tools and their global credibility have created also important preventive effects. For example, the SAFA results show that safety of foreign operators landing at EU airports has improved by nearly 50% between 2008 and 2014.¹⁹² With regard to the EU Air Safety List, in the last years more efforts are being made to help affected countries improve their levels of safety, in order for them to eventually be taken off the Safety List. Through the credibility it has obtained and the consequences that stem from a ban, the Safety List has also turned into a useful preventive tool, motivating countries with safety problems to act upon them before a ban under the Safety List would become necessary.

Regulation 996/2010 on the investigation and prevention of accidents and incidents in civil aviation¹⁹³ brought in a number of rules to better align the way in which accident investigations are organised by Member States in the European Union. It also introduced a number of rules to improve the situation of victims of an aviation accident and that of their relatives. In view of the importance of ensuring that both of these important aspects of aviation safety are maintained, the Union keeps continuing to have the best possible rules. Thus, an evaluation of Regulation 996/2010 is deemed useful. Such an evaluation will make it possible to see whether or not the EU citizens can be ensured that an aviation accident will be dealt with the best possible manner regardless of where in the EU it would occur.

3. Addressing security threats and vulnerabilities to civil aviation

Almost 80% of respondents to the public consultation indicated that security was important for improving the competitiveness of the EU aviation industry. Proposals forthcoming from the consultation point in the direction of a more sustainable aviation security regime that is risk-based, directing security resources to areas where they are most required to address threats evaluated as relevant to civil aviation, thus facilitating greater expedience for passengers and air transport operators in other areas. From the consultation responses, it can be seen that the global nature and routing of many air transport movements is underlined and this points in the direction of international co-operation to establish mutual recognition arrangements that facilitate onward passage of air travellers and cargo through airport hubs by not requiring further security controls on transfer.

The Commission is of the opinion that high standards of aviation security are imperative to the confident functioning, and thus the competitiveness, of the air transport system. Such high standards come at an administrative, operational and financial cost to the travelling public, businesses, air transport operators and the

¹⁹¹ DG MOVE analysis.

¹⁹² Measured by the SAFA ratio.

¹⁹³ <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32010R0996>.

appropriate authorities of Member States. For a policy approach towards high standards of aviation security to contribute to the competitiveness of European aviation, it is vital for this policy approach to address relevant threats and vulnerabilities to civil aviation in a sustainable manner, for which a risk-based approach to aviation security offers the best prospects.

The Commission together with regulators and industry is considering how to shape the future of aviation security. This section presents current and future actions in this field.

3.1 The cost of aviation security. Investment in security: the One-Stop-Security concept

As illustrated in the general introduction, the EU has established a framework for common rules in aviation security that serves the economy and society by ensuring that air transport used by citizens and businesses is protected from acts of unlawful interference, such as sabotage of aircraft.

The standards resulting from these common rules are well above the international level, consistent with the EU objective of a safe and secure air transport. This brings to the forefront the issue of the cost of aviation security. ACI Europe stated that on average, 20% of airport operating costs are security-related.

The cost of airport security is generally passed straight through to airlines in most Member States¹⁹⁴ and airlines have complained that notions of efficiency are absent when there is no compulsory transparency as to how such charges are calculated. In 2009 the Commission proposed a Directive on security charges. It was largely modelled upon the transparency and consultation mechanisms of the Airport Charges Directive. (Some Member States already include security charges in the consultations on airport charges in general.) However, the proposal had to be withdrawn in 2015 since there was no prospect of any agreement between the Council and Parliament.

However, there are other means of addressing this issue. Innovation can be less regulation-driven and more market-driven, meaning that airport operators can have more freedom in determining the security solution that offers the operational efficiency at a reasonable cost, thus meaning that security solutions pay for themselves through providing good throughput, few false alarms and good acceptability by passengers and security personnel alike. Technology plays a central role in this further improvement of aviation security.

Also, an important tool to optimise the investment in security is the One-Stop-Security (OSS) concept. The combination of a common approach to both rule-making and oversight has delivered the EU the ability to activate a One Stop Security system whereby once security controls are undertaken at the point of origin in the EU, no further security controls are required at transfer points in the EU where the integrity of those security controls is protected along the path of air travel. This set-up delivers passengers, businesses and air transport operators with major benefits in terms of greater convenience and speed, operational simplicity, and cost savings, all whilst maintaining a high level of security. The arrangement is even further deployed at international level, through OSS arrangements with partner countries like the U.S., arrangements that deliver a high level of facilitation while preserving the standards of aviation security.

¹⁹⁴ Public financing of non-economic activities must not lead to undue discrimination between airports. Indeed, it is established case law that there is an advantage when public authorities relieve undertakings of the costs inherent to their economic activities. Therefore, when it is normal under a given legal order that civil airports have to bear certain costs inherent to their operation, whereas other civil airports do not, the latter might be granted an advantage, regardless of whether or not those costs relate to an activity which in general is considered to be of a non-economic nature. Cf. Commission Guidelines on State aid to airports and airlines, OJ C 99, 4.4.2014, p. 3–34, Point 37.

3.2 Aviation security equipment

Currently, the lack of harmonised standards and legally binding conformity assessment of screening equipment at the EU level causes fragmentation of the internal market. A clear EU wide acceptance of equipment certification based on EU standards is a powerful tool for promoting this EU standard, and marketing the same equipment, not only in the EU but also elsewhere in the world.

As regards conformity assessment, the Commission's services are currently preparing a legislative proposal that would set up an EU wide conformity assessment scheme, initially referring to the performance requirements already set up in the EU aviation security legislation. It should be noted that the choice of the legislative approach will be taken after a thorough Impact Assessment, but it is likely to require mandatory compliance with the existing requirements for the sale or entry into service of any aviation screening equipment in the EU, and would stipulate that compliance with these requirements has to be demonstrated by means of the Common Testing Methodologies. EU-type approval would be granted to equipment which conforms to the technical prescriptions. Equipment which has been granted EU-type approval would be accompanied by a certificate of conformity delivered by an authority and would be subject to mutual recognition within the EU and, ideally, in other harmonised jurisdictions.

3.3 Air cargo security

Another policy element of importance lies in the EU rules relating to air cargo security. The incidents in October 2010, when two improvised explosive devices were transported as air cargo consignments hidden in parcels, have shown that aviation security measures in respect of cargo and mail remain of great importance. In the aftermath of the incidents, the Commission established an Action Plan on Air Cargo Security. The action plan concluded that security of inbound cargo must be strengthened on the basis of a coordinated approach at EU and international level.

Since 1 February 2012 new rules (ACC3 system) have been introduced which aim to enhance the security of inbound air cargo and mail through a basic security regime (based on ICAO requirements) with which air carriers (not States) transporting cargo and mail to the EU need to comply. By 1 July 2014, every air carrier (EU and non-EU) flying to the EU subjects its air cargo or mail operations in non-EU countries to an EU aviation security validation in order to acquire or maintain the ACC3 designation.

Global air cargo security benefits from the work conducted by ICAO in the area of standards for supply chain security and screening of cargo and mail. Therefore the Commission contributes to the ICAO Working Group on Air Cargo Security (WGACS) but also cooperates with other international organisations such as the WCO (World Customs Organisation) and the various aviation stakeholders.

Finally, the Commission's services are active in the studies regarding the advance cargo information for aviation security purposes, studying and piloting the possibility to benefit from a risk assessment carried out by the customs before a cargo consignment is flown from a third country into the EU. Cooperation is on-going and common agreed principles have been established with international partners (USA, Canada) undertaking similar studies. Discussions have been initiated under the WCO-ICAO cooperation aimed at establishing possible future standards at international level.

3.4 The cybersecurity challenge

A specific aspect of the security of the aviation system relates to cybersecurity. Cybersecurity may be defined as the collection of tools, policies, procedures, security concepts that may be used to protect cyber-environment. It

involves safeguards, guidelines, risk management, actions, threat assessment and technologies that may be used to protect cyber-environment. The objective is to protect the electronic systems environment from any interference that may jeopardise the safety of the aviation system and to mitigate the consequences of the attack (resilience) to avoid any interruption of air traffic.

But cyber-threats are not only affecting civil aviation. At EU level, the Commission adopted in February 2013 a joint communication with the High Representative of the Union for Foreign Affairs and Security Policy laying down the objectives and priorities for an EU Cybersecurity Strategy¹⁹⁵. The main objectives are to ensure an open and safe cyberspace and to protect it from malicious attacks. The communication was accompanied by a proposal for a Directive on Networks and Information security (NIS)¹⁹⁶. A number of actions that the EU Cybersecurity Strategy proposes will address many of the cyber-threats that may also affect air transport¹⁹⁷ (such as Denial of Service attacks). These today prevalent types of attacks have a strong disruptive effect and an important economic cost, but a careful risk assessment from the aviation security perspective indicates that, with the current state of technology, the risk to the actual safety of a flight (that is, the risk that a malicious act could lead to the assumption of the control of an aircraft and its destruction) is very limited. Still, the Commission's services and other entities continue their work with a view to ensuring that the use of new technologies do not bring new or added vulnerabilities.

An important number of critical parts of the civil aviation organisations and operators (airlines, airports, air navigation services providers, suppliers to airports) rely more and more on information technologies and communication systems. They may therefore become increasingly vulnerable to cyber-attacks.

The most concerned areas in aviation by a cyber-attack are not only air traffic management and aircraft communication but also airport management, booking systems, aeronautical information service provider (weather), which are moving to a net-centric operational environment and becoming more dependent on cyber-technological enablers.

EASA has already integrated specific rules on cybersecurity related to the design of new aircraft through the adoption of certification specifications which will ensure the safety of aircraft and its components against cyber-incidents. It may be useful to clarify and reinforce the role of EASA in this domain and to adopt precise requirements for all areas of the aviation system. The recent study of SJU¹⁹⁸ allowed identifying a number of vulnerabilities which need to be addressed in the future ATM system. Building on these recent experiences in Europe, but also in other regions, the Commission assisted by EASA is preparing a list of additional actions which are required to actively prevent and manage cyber-incidents in aviation. Among these actions it is evaluating the need and feasibility of developing a dedicated EU Aviation Response Emergency Team (AV-CERT) similar to the structure being developed by the US.

¹⁹⁵ JOIN(2013) 1 final, 7.2.2013, http://eeas.europa.eu/policies/eu-cyber-security/cybsec_comm_en.pdf.

¹⁹⁶ COM(2013)048 final, <http://eur-lex.europa.eu/legal-content/EN/TXT/DOC/?uri=CELEX:52013PC0048&from=EN>.

¹⁹⁷ The current proposal foresees the following obligations on public administrations and market operators to secure a safe and trustworthy environment: (i) mandatory information sharing on cyber-attacks between national administration and the Commission, (ii) establishment of an EU Computer Emergency Response Team (CERT) and (iii) obligations on the operators to report cyber incident and to establish cyber-security procedures. In this context, the EU Agency ENISA is set to play an important role.

¹⁹⁸ SESAR strategy and management framework study for information cybersecurity.

4. Addressing decarbonisation, environmental protection and human health

4.1 Environment in the public consultation

Asked about the preferred options to reduce the carbon footprint in aviation, EU citizens suggested to focus on 1) improved aircraft design, 2) fuel taxation in aviation, 3) ATM solutions. Asked the same question, aviation professionals showed a clear preference for industry-led initiatives. Innovation meaning more use of biofuels, improved aircraft design and above all more direct flights and other ATM solutions were equally important and to be preferred to solutions such as passenger charges based on polluter pays principle or fuel taxation in aviation.

With regard to the concept of 'green airports' (airports acting on lowering CO₂ emissions from landside access which account for some 50% of total CO₂ emissions of an airport), the EU should help to make this concept a reality for 52% of the respondents with only 12% answering negatively and 36% expressing no opinion. As to how the EU should help, the respondents braced a number of reflections (in the future, as it will be more challenging for airports to secure investments in environmentally-friendly projects which are expensive and have a long payback period, there should be incentives for airports to make such investments). What was clear is that landside access is critical to efficient operations, and projects aiming at increasing sustainable land side access to airports should be supported by the EU. Other ideas which emerged from the public consultation included supporting the use of electric vehicles by the airports, more expensive car parking to discourage the use of private cars, improved commuter transport between airport and city centre, combined bus-rail-air ticketing, improved land use regulation around airports and airport investments measured by environmental benefits.

Finally, over 60% of the respondents found that the EU could do more to promote combining modes (inter-modality), and most of the suggestions concentrated on harmonization between rail and air transport. The work done on this aspect by the European Observatory on airport capacity and quality¹⁹⁹ was mentioned as a good example of EU action facilitating exchange of best practices. Persistent gap among Member States in terms of connections and real possibilities for intermodal travel were also highlighted.

In Europe (and probably more than in other world regions), aviation's environmental impacts are taken seriously. They are also becoming more documented although, as the European Observatory on airport capacity & quality put it in its report on "Economic impact of unaccommodated demand and environmental variables influencing airport capacity"²⁰⁰, "only few methodologies take all effects into account and even fewer propose a monetization of the impacts". The Commission has taken a look at some of them, namely emissions and noise.

4.2 CO₂ emissions: the climate change challenge

The global aviation industry produces around 2% of all human-induced CO₂ emissions. This was about 705 million tonnes in 2013 and is equivalent to emissions from energy-intensive industries such as cement production and refineries and is higher than the total annual 2013 CO₂ emissions of all EU Member States except Germany. Also, aviation is responsible for 12% of CO₂ emissions from all transport sources, compared to 74% from road transport. But unlike other sectors, aviation's emissions are forecast to increase dramatically as air traffic grows worldwide. According to ICAO²⁰¹, emissions from aviation are forecast to grow by at least 63% by 2020 compared with levels in 2006 and by at least 290% by 2050 if no effective mitigation action is

¹⁹⁹ http://ec.europa.eu/transport/modes/air/airports/observatory_en.htm

²⁰⁰ Planned to be published together with the current document at <http://ec.europa.eu/transport>

²⁰¹ Cited at http://ec.europa.eu/clima/policies/transport/aviation/docs/presentation_icao_en.pdf

taken, and in spite of the 2% per annum improvements in fuel efficiency. This means that the 2% of global CO₂ emissions figure could more than double to 4.5% in 2050.

As substantiated by the last report from the Intergovernmental Panel on Climate Change (AR5)²⁰², all sectors, including aviation, must contribute to greenhouse gas emission reduction efforts in order to keep global temperature increase below 2°C over pre-industrial levels.

Against this backdrop and in view of the need for urgent and bold action, the EU included this activity in the EU Emissions Trading System (EU ETS)²⁰³. Considered as the cornerstone of the European Union's policy to tackle climate change, the EU ETS is a key tool for reducing greenhouse gas emissions cost-effectively.

Between 2013 and 2016, the EU ETS covers emissions from flights performed by around 640 aircraft operators between airports located in the European Economic Area (EEA). According to the EU transaction log public website, verified CO₂ emissions from aviation activities carried out between aerodromes located in the EEA amounted to 53.4m tonnes of CO₂ in 2013 and 54.9m tonnes of CO₂ in 2014, which represents an increase of 2.8 % in 2014 compared to 2013. Overall figures according to the EU transaction log public website show around 32m tonnes of emission reductions in 2013 and 2014. Compliance rates with the EU ETS obligations are very high, affecting more than 99.5% of emissions covered by the EU ETS, including from more than 100 third country commercial operators.

4.3 Air traffic noise. Emissions and noise at airports

Effects of air pollution are most pronounced in the vicinity of airports and can have a significant effect on human health. Based on ICAO forecasts, emissions of NO_x and PM from aviation are expected to double in the next two decades, despite significant improvements in technology.²⁰⁴ It has been estimated that air traffic noise around airports affects some 4 million citizens in Europe.²⁰⁵ This helps to explain why there is growing resistance to airport activities and projects across Europe and why there is growing political pressure to better manage population exposure to aircraft noise. Moreover, as Eurocontrol put it in its Challenges of Growth 2013 study²⁰⁶, 'despite improvements in technology which will decrease the actual noise impact per flight, growth in air traffic may lead to an increase in populations affected by aircraft noise. This may trigger more stringent regulatory measures, such as more restrictive noise abatement operational procedures and airport operational noise quotas and curfews, a further challenge to constrained capacity'.

This can be mitigated by other measures and initiatives. The industry has not been standing still and significant improvements have taken place over the past decades. The price of jet fuel (which accounts for over a quarter of the operating costs of airlines – up from 13% in 2001) has also contributed to the drive for greater fuel efficiency. A jet aircraft in service today is over 70% more fuel efficient than the first jets in the 1960s. However, the total fuel burned has also increased due to the high growth in air traffic.

The EU for its part has several instruments to mitigate air traffic noise, in line with the 'Balanced Approach' principles on noise management of ICAO²⁰⁷. Firstly, the EU pursues a policy of high aircraft noise standards, which makes aircraft quieter at source. Secondly, noise can also be reduced by noise abatement operational

²⁰² <https://www.ipcc.ch/report/ar5/>

²⁰³ Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC, OJ L 275, 25.10.2003, p. 32

²⁰⁴ ICAO Environmental Report 2013

²⁰⁵ <http://www.eea.europa.eu/data-and-maps/indicators/exposure-to-and-annoyance-by-1/assessment>.

²⁰⁶ <https://www.eurocontrol.int/articles/challenges-growth>

²⁰⁷ http://www.icao.int/environmental-protection/Documents/Publications/Guidance_BalancedApproach_Noise.pdf

procedures and the environmental performance of the provision of air navigation services is part of the Single European Sky performance-based approach. Thirdly, the EU has a new legislation in place²⁰⁸ on the process which national authorities have to follow when deciding on noise-related operating restrictions at EU airports (the actual decisions remaining within the local authorities). These are measures such as the use of bans on night flights, a particular use of the runway during particular hours of the day, the imposition of a noise quota or noise limits, the imposition of noise charges and finally the imposition of restrictions on the number of movements (movement caps).

The main focus for the coming years will be to correctly apply Regulation 598/2014 which will enter into force on 13 June 2016. That Regulation contains updated provisions on the process to be followed for the introduction of noise-related operating restrictions at airports, and its article 6 requires that the noise situation at an airport is assessed regularly and that in case of new operating restrictions, the local residents and authorities are consulted. As the European Observatory on airport capacity and quality states in its 2015 report on "Airport capacity in the EU: a strategic perspective"²⁰⁹, evidence demonstrates that where there is extensive and effective engagement between all relevant parties including especially representatives of neighboring communities, it is possible to secure more acceptance for airport activities and projects which balance the need for growth with realistic environmental protection and proper consideration for human health and well-being.

4.4 Inter-modality

Inter-modality relates to seamless travel using different transport modes employing advanced technologies. This concept has been increasingly analysed and discussed over the past decades. The Commission's 2011 White Paper on Transport²¹⁰ described the necessity to come to an "efficient core network for multimodal²¹¹ intercity travel and transport for the sake of resource efficiency, resilience of the transport network" and passenger mobility. The 2010 volcanic ash crisis had showed the importance of network resilience and exposed the current absence of valid fall-back options.

The 2013 TEN-T Guidelines and Connecting Europe Facility (CEF) Regulations²¹² are beneficial to intermodal infrastructure development, as illustrated by the corridor approach favouring intermodal options and by the requirement for 38 core airports to be connected to the rail network by 2050. In terms of funding, besides support for SESAR deployment, airports are today able to receive grant funding from the CEF for improving their multimodal connections, in particular with railways. The Regional Funds also see inter-modality as a priority criterion for funding eligibility, while not excluding infrastructure development when accompanied by improvement of the environmental footprint of an airport.

Still in 2013, the European Observatory on airport capacity and quality issued policy recommendations on actions to promote inter-modality at airports in the interest of the passenger, especially air-rail inter-modality²¹³. In particular, the Airport Observatory found that substitution of shorter haul flights by other modes can free up slots, which allows for some growth at busy airports; also, the potential being limited as more choice increases mobility, improving passenger's choice and experience are more than valid reasons to pursue increased inter-

²⁰⁸ Regulation 598/2014 on noise-related operating restrictions at EU airports, which will enter into force on 13 June 2016

²⁰⁹ The report "Airport capacity in the EU: a strategic perspective" is available on DG MOVE website

²¹⁰ http://ec.europa.eu/transport/themes/strategies/doc/2011_white_paper/white-paper-illustrated-brochure_en.pdf

²¹¹ In the current context the definitions of intermodality and multimodality are the same.

²¹² http://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/project-funding/cef_en.htm

²¹³ http://ec.europa.eu/transport/modes/air/airports/observatory_en.htm

modality. Lastly, Eurocontrol, in its Challenges of Growth 2013 study, estimated that doubling projected High Speed Rail capacity can meet 11% of aviation "over demand" by 2035²¹⁴.

Yet, the facts show that, for inter-modality to be fully operational, further efforts are needed. First of all, in order to support the emergence of more comprehensive multimodal travel information and planning services, the IT application developers and service providers need first and foremost fair and equal access to good quality data from all transport modes and mobility services. The development of the internet, of IT applications and the use of meta-search engines will facilitate this evolution and change distribution channels. Furthermore, transport operators (e.g. high speed rail and airlines) would need to increase cooperation, so as to provide for all the necessary practicalities.

An EU regulatory framework could be developed to support passengers who use multimodal travel solutions, including liability, insurance and passenger rights issues. The study mapping existing business models of on-line comparison tools provides indications helping to identify regulatory gaps²¹⁵. Also, since the 2010 volcano ash crisis, new tools have been created to allow more efficient handling of major disruptions, in particular in air transport (e.g. setting-up of the European Aviation Crisis Coordination Cell - EACCC). However, solutions are often only looked upon at modal level. Improving multimodal transport connectivity in the event of a crisis would make it easier for passengers to reach their final destination and increase the overall resilience of the European transport system.

Close proximity is required for better integration of the different transport modes in multimodal hubs. The further away the connection, the fewer passengers will use it. In the specific example of airports, a new build or retrofitting of existing buildings needs to enable this. Promising work is being carried out at some airports in discouraging access by private car while increasing passenger satisfaction (e.g. Arlanda airport), investing in closer proximity of (public) transport options to further improve the modal split (e.g. Oslo).

Better integration of the different transport modes also requires a certain degree of schedule density : Public transport operators risk losing passengers to private car/taxi when they have to wait too long for a (public) transport connection at an airport, bus stop, railway station or ferry terminal. This question can be addressed in the framework of the Sustainable Urban Mobility Plans²¹⁶, the Covenant of Mayors²¹⁷ or the European Innovation Partnership on Smart Cities and Communities²¹⁸. This issue can also be taken on board in the corridor work of the European Coordinators.

Research efforts into green technologies can contribute to diminishing the environmental impact of the different modes (emissions, noise, impact on soil, etc.). The same applies to support provided in favour of the uptake of clean technologies which are out of the research phase, such as Electric Green Taxiing Systems²¹⁹ and 400 Hz fixed electricity supply for stationary aircraft. Such initiatives will contribute to the airside greening of airports, a conclusion which was also supported by the respondents to the public consultation question on making the concept of 'green airports' a reality.

To sum up, the economic case for better intermodal options can easily be made, not only for the aviation sector, where it can enable future growth, but for the European transport system as a whole.

²¹⁴ <https://www.eurocontrol.int/articles/challenges-growth>

²¹⁵ http://ec.europa.eu/consumers/consumer_evidence/market_studies/docs/final_report_study_on_comparison_tools.pdf

²¹⁶ http://ec.europa.eu/transport/themes/urban/urban_mobility/action_plan_en.htm

²¹⁷ http://www.covenantofmayors.eu/index_en.html

²¹⁸ <http://ec.europa.eu/eip/smartcities/>

²¹⁹ <http://en.wikipedia.org/wiki/EGTS>

4.5 Environmental sustainability of air transport

The competitiveness of the EU aviation sector and its environmental sustainability interact. The challenge regarding this issue has not changed over time: balancing the need for growth with environmental protection and proper consideration of human health and wellbeing.

An important contribution to the reduction of aviation's environmental impacts will come from current research and development actions for innovative “green” technologies. This is an area where the EU has been concentrating on for decades by providing general framework and financial support. EU programmes have mainly covered the modernization of air traffic management (SESAR), the reduction of the impact on the environment (Clean Sky), medium to long term research and development actions for innovative technologies not covered by Clean Sky and outside the scope of SESAR (Horizon 2020), in line with the Strategic Research and Innovation Agenda (SRIA) of the Advisory Council for Aviation Research and Innovation in Europe (ACARE) as highlighted in the chapter on 'Innovation'. Regarding TEN-T funding, as indicated above, this may focus on bringing SESAR solutions and improving intermodal links at airports rather than improving airport infrastructure itself.

Consistency in regard to environmental protection could be ensured through reinforcing existing in-sector environmental policies and measures across the air transport system (manufacturers, airlines, airports, air traffic control). In this respect, it is noted that environmental protection requirements must be integrated into the definition and implementation of all Union policies and activities (Article 11 TFEU).

As illustrated above, many in-sector policies and measures are already being implemented, but they could benefit from more visibility and being addressed more consistently within a single overall framework. Environmental measures can give rise to interdependencies and trade-offs (e.g. between noise and emissions) which need to be addressed through a comprehensive and consistent approach. Initiatives already taken by the industry and the identification of best practices should also be properly considered.

In order to help drawing proper conclusions at all times a system for more consistently monitoring of and reporting on the impacts and progress of the different in-sector environmental policies and measures across the EU air transport system could be considered. This could be published in the form of an annual "European Air Transport Environment Report", which would allow the EU, the Member States and the industry to better track the environmental performance of the air transport sector, similar to what is already done in aviation safety.

Cooperation between the Commission, EASA and Eurocontrol could be enhanced in supporting a more data-driven approach to the EU's input into European and international policy-making in this field and also establish a better coordinated policy steer to European aviation environmental research and modelling activities. EASA's role in supporting the Commission as a technical adviser in aviation environmental regulatory matters could also be strengthened in the framework of its future reform and reorganisation.

5. Addressing social, employment and change managements issues in civil aviation

5.1 A state of play

Aviation is an important employment sector, with high value-added jobs. According to the most recent study available²²⁰, the EU air transport cluster, which includes all activities considered essential for flight operations,

²²⁰ Source: Steer Davies Gleave 2015. Forthcoming study on employment and working conditions in air transport and airports, commissioned by DG MOVE, featuring 2013 data.

directly employs around 1.4 million people, mostly high value-added ones: 33% manufacturing and repairing of aircraft, 31% airlines, 18% airport operators and handling – which includes air navigation services –, 18% tour operator and travel agencies, the remaining 20% including flying schools, renting and leasing of aircraft, and regulatory administration. Out of these 1.4 million jobs, 400,000 are established within the airport perimeters. Another 0.5 million jobs, which by definition do not pertain to the air transport cluster, can be found within the physical limits of the airport campuses (e.g. retail activity). This brings the total to 1.9 million direct jobs in the EU. Taking into account the indirect effects, the total number of jobs generated by air transport, airports and related activities, as well as their suppliers, amounts to 4.8 million, i.e. 2.2% of the EU total workforce.

According to the same analysis, the direct contribution of air transport and airport related activities to the EU's GDP amounts €110bn. Taking into account indirect effects, that number increases to roughly €300bn, which is equivalent to Austria's GDP.

Besides direct and indirect effects, some analyses have also addressed induced and catalytic impacts, as estimated through various econometric models (see above on connectivity issues).

Since the completion of the aviation internal market (1997), direct employment in aviation has remained stable while the aviation market was booming. Over the period 2000-2013 passenger traffic in the EU28 has grown at a compound average rate of +3.0% p.a., i.e. totalling +47% over that period. The bulk of this growth was experienced in the years between 2003 and 2007. In spite of that growth, the number of jobs in air transport and associated industries declined. Whilst employment trends in transportation and storage are approximately equivalent to those seen in the overall economy in the years up to 2008, there is a stark contrast between the growth seen in these areas and the decline in employment in the air transport cluster over the same period. All categories saw a decline in the years following 2008, with transportation and storage decreasing slightly faster (-0.8%) than the overall economy (-0.7%), and employment in the air transport cluster decreasing even faster again (-1.3%). In 2013, employment in the overall economy was 4.6% higher than 2000 levels, whilst transportation and storage saw a 3.4% net increase over the same period. Employment in the air transport cluster was more significantly impacted, with a net reduction of -7.0% over the 2000-2013 period.

These developments took place in a context of rapidly increasing productivity and more widespread recourse to outsourcing. If productivity growth is calculated on the basis of EU airline passengers per person employed, there was a 43% improvement between 2000 and 2013, or 4.3% per year. However 4% of this is accounted for by the fact that journey lengths reduced on average. A further 24% of this accounted for by more passengers being transported on the aircraft, due to higher load factors and seating densities, and possibly the use of larger aircraft. Productivity growth measured on the basis of persons employed per flight-kilometre was 15% between 2000 and 2013, or 1.3% per year. Over this period, there was a large move towards outsourcing ground-handling by airlines. This move represents a further 3% of the productivity improvements. If productivity growth was measured in terms of airline and ground-handling employees per flight-kilometre, it would be approximately 13%. Finally, if calculated in terms of Gross Value Added (GVA) divided by the number of jobs, productivity in the air transport sector increased by 24.3% between 2000 and 2011, i.e. much faster than in the overall economy (+11.6%) and in transportation and storage (+8.3%).

The conclusions from that analysis²²¹ also address qualitative questions:

- **Business model change:** Much of the observations and conclusions reached in the 2012 study²²² remain the same. In order to compete effectively, air transport organisations require greater flexibility and improved

²²¹ Source: Steer Davies Gleave 2015 (see above).

cost-effectiveness. To do this, they have changed some aspects of their business models to reduce costs, including reducing the need for staffing, and have made substantial productivity improvements.

- Age: 15-29 would also be most impacted by changes in employment and working conditions, as those entering the workforce for the first time are most likely to be engaged under some of the newer employment arrangements seen in the sector, such as self-employed air crew. Some positive developments with respect to the development of skills and expertise, however, with one airline working with two temporary agencies to provide graduating pilots with 12 month cadetships, through which the pilots gain experience as type-rated first officers and receive a salary.
- Employment arrangements: The use of temporary agency workers (TAW) is an established practice for a number of airlines; whilst temporary work agencies within the EU have traditionally been a source of cabin crew and flight crew for low cost carriers, we have seen evidence of an established carrier using temporary agency workers based outside the EU for cabin crew and also outsourcing some routes in entirety to a temporary work agency (also based outside the EU). Self-employment is not common in the sector overall, although as reported in the University of Ghent study on "Atypical Employment in Aviation",²²³ self-employment for flight crew is used by a number of airlines. Whilst TAW and self-employment have grown potentially more prevalently in this sector, levels remain significantly lower than in other sectors and the economy as a whole.
- Unionisation: membership in the air transport sector have reduced, particularly at airlines, where low cost carriers have much lower union representation than the network carriers
- Operational bases: Significant differences in taxation, social security and labour law between Member States can cause legal uncertainties for the employees concerned, particularly if they operate from a base in a different country from where they live. These differences can be especially difficult for temporary agency workers and workers on fixed-term contract to negotiate their contract, since often the resolution of legal uncertainties takes place in court only after it is terminated.

Pressure on airlines to reduce operational costs has been significant. Network carriers have outsourced non-core activities and gradually also core activities to improve productivity and profitability in the context of difficult restructuring of their activities. Airlines push for reform to make Air Traffic Control more efficient, to lower charges at airports, and to liberalise ground-handling while trade unions oppose reforms which could impact employment levels and social conditions. Under these circumstances an inclusive social dialogue in industrial relations is essential to avoid social tension from causing serious disruption of services..

In line with the Treaty, the EU established rules to ensure the free movement of workers, including coordination of social security, social dialogue mechanisms at EU level are in place and a series of minimum standards have been defined in EU labour law on key aspects of working conditions, notably regarding working time, temporary agency work, fixed term and part-time work, and information and consultation of workers.

In the context of the 2011 White Paper "Roadmap to a Single European Transport Area", the Commission undertook to promote quality jobs and good working conditions in transport. The Commission wants to see "a socially responsible aviation sector" and to continue to evaluate the "EU approach to jobs and working conditions across transport modes" (Actions 10 & 11 of that White Paper). In that context the Commission (DG MOVE) has presented analyses on employment, working conditions and the impact of liberalisation: in 2010, a

²²² Study on the effects of the implementation of the EU aviation common market on employment and working conditions in the Air Transport Sector over the period 1997/2010, Final Report Report, July 2012. See http://ec.europa.eu/transport/modes/air/studies/doc/internal_market/employment_project_final_report_for_publication.pdf

²²³ See <https://biblio.ugent.be/publication/6852830>.

Staff Working Paper for the period 1997-2007. In 2013 it published the Steer Davies Gleave's 2012 report, covering the 1997-2010 period. The 2012 report was presented in the framework of the Fitness Check on Internal Aviation Market,²²⁴ which evaluated a wide range of EU rules in the air transport sector. The same analysis is being extended and updated to cover the period up until 2013, addressing both quantitative and qualitative aspects. It will be available in October 2015.

The Commission stressed the importance of social dialogue, and the social dimension of transport, closely linked to the competitiveness issue, was highlighted at the High-Level Conference “a Social Agenda for Transport”, convened by the Commission on 4 June 2015.²²⁵ Member States, the European Parliament and the Commission, the European Economic and Social Committee, the aviation industry and social partners took an active part in this event, which confirms the importance of social matters in transport, and air transport in particular.

In September 2015, the Economic and Social Committee adopted an own-initiative report on "Social dumping in the European civil aviation sector"²²⁶, while the TRAN and EMPL committees of the European Parliament have organised hearings related to atypical work in civil aviation.

Since 2012, the work programme of EU sectoral social dialogue committee for civil aviation (SSDC) has included the issue outsourcing to temporary workers, independent and self-employed workers in air crew (cabin and cockpit crew). This issue is at the centre of a joint project by the European Cockpit Association (ECA), European Transport Workers' Federation (ETF) and the Association of European Airlines (AEA), for which the social partners received funding under the Commission's Social Dialogue budget line. In the framework of this study, the EU social partners commissioned a study on trends in atypical forms of employment which was done by the University of Ghent.²²⁷

Finally, the following elements were stressed in the context of the public consultation: better regulation of atypical employment; better definition of the 'home base' criterion; assessment of the application of the 'principal place of business' criterion; social dumping; possibility of negotiating cross-national-wide collective labour agreements; necessity of a level playing field in terms of social standards.

5.2 Change management in civil aviation.

The development of transnational airlines, based in several Member States with staff of different nationalities, means that air transport is facing the same challenges and opportunities that exist in other transnational service activities. In particular, the question of which standards apply to transnational companies' employees and the risk of an un-level playing field due to differences in social standards among Member States are regularly brought up. These transformations created challenges for the social partners who no longer act within a group contained at national level but must adapt their context and the framework of their industrial relations to a transnational environment. Reflection on the means of promoting transnational agreement negotiations within companies or possible agreements between European social partners across the whole sector should be taken further, through relying on the EU sectoral social dialogue committee for civil aviation.

²²⁴ See http://ec.europa.eu/transport/modes/air/internal_market/fitness_check_en.htm.

²²⁵ See http://ec.europa.eu/transport/media/events/2015-06-04-social-agenda-for-transport_en.htm.

²²⁶ [Social dumping in the European civil aviation sector \(own-initiative opinion\)EESC-2015-00417-AS-TRA Rapporteur: Anne Demelenne \(Work./BE\).](#)

²²⁷ See <https://biblio.ugent.be/publication/6852830>. See

https://www.eurocockpit.be/sites/default/files/report_atypical_employment_in_aviation_15_0212_f.pdf.

5.3 Highly mobile workers (contracts, social security and taxation)

The EU labour law and occupational safety and health acquis, provides for minimum standards which also benefit workers in civil aviation. However, in a context of multiplication of operational bases within the different Member States, the different employment relationships, the use of outsourcing of workers and services, self-employment, the determination which law is applicable to, and which jurisdiction is competent regarding employment contract can become very complex. Clarifying the regulatory framework is thus a useful exercise on which the Commission's services are working in cooperation inter alia with the working group on social matters in aviation composed of national experts.

With regard to issues concerning the applicable labour law to employment contracts and competent jurisdiction, the Commission's services are working on improving awareness about international jurisdiction issues (Brussels I Regulation²²⁸) and applicable law to employment contracts (Rome I Regulation²²⁹) for legal practitioners, in the framework of the European Judicial Network in civil and commercial matters. It is planned to publish, in the first half of 2016, a practice guide on the application of EU civil justice instruments to international employment contracts.

On social security, since the 2012, the "home base"²³⁰ has been recognised as the criterion determining the applicable social security scheme for aircrews; flight crew (pilots) and cabin crew (stewards and hostesses)²³¹. The concept of "home base" had been initially established in a different context (flight time limitations rules in the area of safety), and could be further clarified for the purpose of the application of the social security legislation, especially in the context of the multiplicity of operational bases and thus, multiple home bases for aircrews. Also, regarding the multiplicity of bases, Regulation 465/2012 emphasises the need to ensure that the applicable legislation for flight crew and cabin crew members remains stable and that the 'home base' principle does not result in frequent changes of applicable legislation due to the industry's work patterns or seasonal demands.²³² The Practical Guide - The applicable legislation in the EU, EEA and in Switzerland (2013)²³³ is a valid working instrument on social security to assist institutions, employers and citizens in determining which Member State's social security legislation should apply in given circumstances. The Administrative Commission, which adopted the Practical Guide, follows up the implementation of these provisions.²³⁴

Some EU social partners have proposed to change aviation law and extend the home base criterion to determine not only the applicable social security regime to aircrews, but also the relevant employment and taxation legislation. If, after proper assessment, the practice guide on the application of EU civil justice instruments to international employment contracts would prove not to improve the proper understanding of existing rules concerning crew workers, the adoption of corresponding sector-specific guidance may be considered. Should

²²⁸ Regulation (EC) No 44/2001 on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters. OJ L 12, 16.1.2001, p.1.

²²⁹ Regulation (EC) No 593/2008 on the law applicable to contractual obligations (Rome I). OJ L 177, 4.7.2008, p.6.

²³⁰ The home base concept is defined as the location nominated by the operator to the crew member from where the crew member normally starts and ends a duty period, or a series of duty periods, and where, under normal conditions, the operator is not responsible for the accommodation of the crew member concerned. Annex III to Council Regulation (EEC) No 3922/91 of 16 December 1991 on the harmonization of technical requirements and administrative procedures in the field of civil aviation, OJ L 373, 31.12.1991, p. 4.

²³¹ Regulation (EU) No 465/2012 amending Regulation on the coordination of social security systems and Regulation (EC) No 987/2009. OJ L 149, 8.6.2012, p.4.

²³² In addition, the European Transport Workers' Federation (ETF) proposed to reduce the 10-year transitional period provided for in Regulation 465/2012 on the coordination of social security regimes, and to address the issue of air crew with multiple bases.

²³³ <http://ec.europa.eu/social/BlobServlet?docId=11366&langId=en> <http://ec.europa.eu/social/BlobServlet?docId=11366&langId=en>

²³⁴ The Administrative Commission for the coordination of social security systems comprises a representative of the government of each EU country and a representative of the Commission. It is responsible for dealing with administrative matters, questions of interpretation arising from the provisions of regulations on social security coordination, and for promoting and developing collaboration between EU countries. The composition, operation and tasks of the Administrative Commission are laid down by Articles 71 and 72 of Regulation 883/2004.

the Commission conclude that more precise rules on these points are needed, it may adopt a proposal to this effect

5.4 Airlines' rule shopping for air licences

Over the last year was fuelled a debate on the emergence of so-called flags of convenience and rule shopping in aviation. Social partners have criticized alleged practices of granting a licence on the ground that an airline would seek to avoid more demanding national labour laws. Aviation was also compared to the maritime sector²³⁵, with practices of airlines flagging/de-flagging in order to benefit from better taxation or social conditions. The evidence available so far does not suggest that airlines licences have been unlawfully granted, having regard also to the fundamental principles of EU law, such as freedom of establishment.

Also there is no evidence at this stage of trends whereby airlines would be rule shopping when applying for licences. The modification of Regulation 1008/2008 requested by the social partners²³⁶ so that a licence would only be given to airline on the basis of a revised definition of "principal place of business" requires further evidence. The current definition does not expressly mention that substantial aviation operations need to take place in the country issuing the licence and Air Operator Certificate (AOC) (this existed prior to 2008 but was removed at the time of negotiations of 1008/2008). Any potential amendments to the definition of "principal place of business" should be considered with great care, having regard to the function of Regulation 1008/2008, the fundamental Treaty rules and the need for legal certainty.

5.5 Atypical forms of employment in civil aviation

Traditionally, employment in civil aviation was 'typical', i.e. employees were enjoying full-time contract of indefinite duration with a single employer. This is changing, as for other sectors of the economy. 'Atypical' forms of employment are manifold, e.g. staff hired through temporary work agencies working for the airline, fixed term employment, part-time employment. While these atypical forms of employment are legal forms of employment and are subject to EU rules, they should not lead to abuse. The phenomenon of self-employed pilots at certain airlines, has led to allegations of bogus self-employment at certain airlines. Other developments, i.e. regarding "pay-to-fly" and 'zero-hour' contracts, are raising concern too. A recent report on "Atypical Employment in Aviation",²³⁷ commissioned by EU social partners ECA, AEA and ETF focused on the situation of self-employed pilots, but also highlighted developing practices such as "zero-hour" contracts and "pay-to-fly" schemes for pilots. But the situation of aircrew working on atypical contracts²³⁸ requires a better understanding and to act in case of abuses.

More fact finding is being done by the Commission's services, with the update of the analysis on employment and working conditions in air transport and airports. The analysis –both quantitative and qualitative- is being deepened, to address every issue raised by outsourcing practices in air transport.

²³⁵ Three major differences between air transport and maritime transport: (1) Shipping is fully liberalised, governed by comprehensive global rules agreed in the IMO and the ILO, while no global open skies agreement exists in aviation, where rules. Rules of ownership and control are strictly defined by legislation, in the case of the EU by the EU legislator (2) In practice, two very different transport modes where working conditions are not at all comparable; (3) The system for enforcement of applicable standards is different. In shipping, flag State is primarily responsible for ensuring that ship is complying with applicable standards, while in aviation, the CAA of the country issuing the AOC plays a key role.

²³⁶ See "Joint declaration against EU-based flags of convenience in aviation", as endorsed by the Air Crew Working Group of the EU Sectoral Social Dialogue Committee for Civil Aviation, 5 June 2014.

²³⁷ See full report at https://www.eurocockpit.be/sites/default/files/report_atypical_employment_in_aviation_15_0212_f.pdf.

²³⁸ Eurofound's definition: any employment contract that is not full-time and of indefinite duration with a single employer as coming under the definition of atypical work.

While atypical forms of employment may be legitimate forms of employment, abuses such as “bogus self-employment” are not. Fighting them is primarily the role of national enforcement authorities, such as labour inspectorates. There is no EU legislation setting criteria for determining who are self-employed workers as opposed to employees. This matter is left to the Member State authorities, including the courts. However, in October 2014 the EU Council of Employment and Social Policy Ministers agreed on a general approach to establish a European Platform to better prevent and deter undeclared work²³⁹. Its goal is to foster cooperation between Member States concerning the enforcement of labour law and social legislation to combat undeclared work and bogus self-employment more effectively at the EU level. The Platform once established, will determine its priorities in its two-year work programmes, including work done on bogus self-employment. One of the platform's objectives is to exchange information and best practices, it could also develop expertise, and guidelines for enforcement authorities. ETF recommends, on the other hand, adopting legislation against bogus self-employment.

On "pay-to-fly", which has been reported recently to the Commission, an evidence-based analysis is being performed in association with experts, to assess the extent of the phenomenon and its possible impacts, including on safety.

5.6 The international dimension

Aviation is an international activity by nature but is still very much national in its operations and the way it is regulated. Employment and social matters in aviation have never been very high on the agenda of international organisations (ILO and ICAO), nor at bilateral level except in a few cases, notably the EU-US context (during the negotiations on the two Open skies agreements and in the dispute on Norwegian Air International). It is worth noting that the EU has sought inclusion of social clauses in recent air transport agreements.

It would however be beneficial to look at the status of operational basis established by EU airlines abroad; and of the operational basis of foreign carriers within the EU, and at the applicable labour/taxation regimes of pilots and cabin crew in that context. The role of international pilot agencies, of international temporary work agencies needs to be clarified.

6. Addressing social issues in air traffic management

6.1. Problems for air traffic resulting from industrial action

When industrial action or strikes occur in ATM, this can cause significant problems in terms of delays and cancellations across a major part of European airspace, even if the strike is limited to one air navigation service provider (ANSP). According to the Network Manager, even if the effective coordination of ANSPs at network level limits the consequences of a series of strikes, related delays still equated to respectively 13.6% and 13.4% of en-route delays in 2013 and 2014, respectively. Although only partially to blame, resulting inefficiencies from strikes can cause significant financial losses and inconveniences for airlines, ANSPs, employees and of course passengers. Improving the national regulatory frameworks to better mitigate the operational impact of strikes is a challenge for the future. In particular a minimum level of service in managing European airspace should be promoted. Strengthening industrial relations should continue via the Specific Sectoral Dialogue Committee on Civil Aviation and on Air Traffic Management, in particular, in order to come to an agreement prior to announcing any industrial action

²³⁹ http://europa.eu/rapid/press-release_IP-14-1166_en.htm. It is currently being discussed in Trilogue.

In this context, strengthening and harmonising national rules as regards the right to strike may be considered as part of the various options. The exchange of good practices could ensure that ANSPs are notified far enough in advance of any strikes in order to plan mitigation actions (as there is currently no homogeneity of notification periods on air traffic controller strikes). Action could also take the form of promoting a minimum level of service in managing European airspace, allowing at least for the movement of critical flights and overflights (flights crossing the airspace of an affected state or area) and ensuring a level of service that would cause the least amount of disruption to the network. Finally, professional staff associations and unions could continue advancing social dialogue within the Community method, to prevent as much as possible strikes and disruption to the European air traffic network

6.2 Air traffic controller (ATCO) mobility

In accordance with the fundamental Treaty principles of free movement air traffic controllers in the EU are free to work for any ANSP in any EU Member State under their European ATCO license. This provides for a legal level playing field, allowing for the mutual recognition of harmonised qualifications among EU Member States. It specifies which rights and duties are granted to an ATCO who wishes to move to another country to work as an air traffic controller. Numerous factors come into play with this possibility, however, mostly related to human factor issues such as cultural and language differences and operational adaptation. Mobility should contribute to increase the skills, diversify the work experience of the ATM staff member and bring relevant solutions when operational needs for more capacity are required.

Dialogue should continue with both ATM sector employers and employees on issues related to ATCO licensing and staff mobility. Defining the types of mobility is also important, and tools are needed to overcome any possible barriers for mobility. Rights and obligations for ATCOs interested in mobility opportunities must be agreed to ensure the smooth integration of the staff members into their new place of employment. As technology is a major driver for ATM, the future may bring possibilities of 'virtual mobility', where an ATCO could control airspace sectors from a remote location. Such developments will also need to be taken into consideration in future discussions on ATCO mobility.

7. Passenger rights and consumer protection: Revision of the passenger rights' regulation.

Application of the existing rules

The liberalisation of air transport in the EU, with the emergence and expansion of different business models as well as the extension of route network, has combined to create a wider choice of airlines and services. Travelling by air is no longer perceived as a luxury, but a mode of transport competing with others and a self-evident right for European citizens and businesses.

On the other hand, air transport has in some respects been negatively affected by delays in the airspace due to airspace congestion, more crowded airports and insufficient contingency planning in case of severe weather conditions or events and stricter security measures which also increase waiting times, bigger airports with longer distances which increase the risk of flight delays and lost luggage.

The lack of transparency of air travel offers regarding the final price or the exact content of the service is a regular source of complaints from consumers to European Consumer Centres, as air travel represented 18% of all cross border complaints they received in 2014²⁴⁰.

²⁴⁰ http://ec.europa.eu/consumers/solving_consumer_disputes/non-judicial_redress/ecc-net/docs/ecc_net_-_anniversary_report_2015_en.pdf, page 22.

The issues reported by consumers correspond to the change in the pricing strategy of companies to align to the "low cost" carriers' model where all dispensable elements (food, transport of luggage in the luggage compartment, no printed boarding passes) are not included anymore and many options are offered sometimes with a lack of transparency.

7.1 Revision of the passenger rights' regulation

As illustrated in the general introduction, the EU has adopted several regulations on air passenger rights to remedy these problems as well as to encourage fair commercial practices. The action at EU level in the pursuit of high level standards of passenger protection is based on the desire to provide for consistent rules across the liberalised transport market in view also of the cross border dimension of the service. Individual action by Member States in the field of air passenger rights could have led to a new fragmentation of the air transport market, thereby deviating from the objective of creating a level-playing field for all airlines in the EU, with the risk of depriving EU citizens from any protection as Member States would be tempted to keep the level of protection as low as possible in order to favour their home based airlines. Furthermore, on 13 March 2013, the European Commission proposed a revision of Regulation 261/2004 on air passengers' rights in case of denied boarding, long delays and cancellations. It proposes measures to ensure that air passengers have new and better rights to information, care and re-routing when they are stranded at the airport. At the same time there will be better complaint handling procedures and enforcement measures so passengers can actually obtain the rights to which they are entitled.

The proposal also clarifies key aspects of EU law which have been a source of difficulty for passengers and air carriers alike and it introduces new passenger rights where necessary while taking into account the financial and economic impact on the air transport sector. It provides passengers with effective complaint handling procedures and strengthens enforcement, monitoring and sanctioning policies to ensure a better application of all passenger rights. As long as new rules will not have been adopted, it is necessary that the existing rules be strictly applied by the National Enforcement Bodies, having regard to the jurisprudence of the Court of Justice of the European Union. This notwithstanding, the pending Commission proposal highlights that passengers and air carriers ought to benefit as soon as possible from a consolidated and consistent legislative framework at EU level on air passenger rights improving the quality of service and providing seamless travel conditions across the EU.

Improving consumer conditions therefore requires a prompt and fair revision of Regulation 261/2004 on air passengers' rights.

8. Consumer protection in civil aviation

In the European Union, the following consumer legislation is particularly important for passenger air transport; Directive 93/13/EEC on Unfair Contract Terms (UCTD), Directive 2005/29/EC on unfair commercial practices (UCPD), Directive 2011/83/EU on Consumer rights (CRD) as well as Directive 90/314/EEC on package travel (PTD), which will be replaced by the new Directive on package travel and assisted travel arrangements as from Summer 2018.

In addition, under the Consumer Protection Cooperation (CPC) Regulation (2006/2004/EC), Member States, in dealing with "intra-Community" infringements, have the duty to work together, within the CPC Network, to enforce EU consumer rules and can call on the assistance of the European Commission as a facilitator²⁴¹. In this

²⁴¹ OJ L 364, 9.12.2004, p. 1–11, Recital3, Articles 7,8,9 and 16.

respect, every year, this Network identifies common enforcement priorities and carries out specific activities, for example and among others, sweeps – systematic checks – carried out simultaneously in different Member States to investigate breaches of consumer protection law in one particular on-line sector – and common enforcement actions – where national enforcement authorities coordinate their legal approach on consumer rules and adopt a common position, based on Article 9(2) of Regulation 2006/2004 which says that Member States' competent authorities shall seek to conduct simultaneous investigation and enforcement measures and coordinate their activities in case an intra-Community infringement harms the interest of consumers in more than two Member States.

In 2013, the sweep exercise concentrated on travel services and the results pointed out that a number of contract terms in the airplane ticket sector appeared as potentially contrary to the consumer protection rules laid down in Directive 93/13/EEC on Unfair Contract Terms (UCTD) and a number of unfair commercial practices appeared potentially contrary to the Directive 2005/29/EC on unfair commercial practices (UCPD).

As a consequence Member States called on the owners of those transport websites that were found breaching consumer law which resulted in a vast majority of the breaches been corrected.²⁴²

On the other hand, several Member States signalled their intension continue the cooperation on the outstanding potential issues with regard to unfair contract which embrace the following questions:

- communication and transparency of contractual terms, such as for example terms which make abundant use of cross-references, overlaps of terms and conditions, terms and conditions not accessible off line, terms which are unclear;
- unilateral alteration of contractual terms, such as for example terms empowering one party to unilaterally modify some conditions of the contract performance without a valid reason specified in the contract;
- limitation or exclusion of the airlines' liability, such as for example terms seeking to exclude or limit the carrier's obligations towards passengers laid down in the provisions of EU law;
- limitation of consumer rights, such as for example terms imposing disproportionate fees / unreasonably complex procedures in order to reclaim charges in case of ticket cancellation;
- terms which otherwise create a significant imbalance to the detriment of the consumer, such as for example terms providing for the automatic cancellation of the return ticket if the outbound ticket was not used or terms providing for an unqualified non-transferability of tickets;
- terms hindering the consumer's right to take action in relation to disputes, such as for example terms unilaterally conferring to a specific jurisdiction an exclusive and mandatory competence over disputes relating to the contract;

and with regard to unfair commercial practices which involves the following questions:

- information about the main characteristics of the service;
- drip pricing, where unavoidable booking or service fees or payment surcharges are added to the price;
- information about the complaint procedure;
- contact details of the trader / service provider;
- breakdown of the final price;
- availability of contract terms before the confirmation of the purchase;

²⁴² http://ec.europa.eu/consumers/enforcement/sweeps/travel_services/index_en.htm.

- the language of the contract terms.

The public consultation on the competitiveness of the aviation sector concentrated on questions that were related to consumer protection, too. Passengers highlighted - when ranking of the options how to reaffirm consumer protections – that the most important areas to concentrate on were (1) optional price supplements displayed during booking process (2) terms and conditions of carriage available in the language(s) of the country of purchase (3) fuel surcharge be forbidden to be collected (4) reimbursable elements should be reimbursed at no (or reasonable) admin cost to passenger and (5) reimbursable elements of the ticket should be identified at the time of purchase of the ticket.

While it seems that the above mentioned potential issues are gradually fading out in terms of number of infringements, communication and coordination between enforcement bodies of Member States could be facilitated with a view to better protecting consumers flying in Europe.

9. High standards in business conduct & unfair practices in the global aviation market

9.1 General

EU airlines operate in a very competitive environment both within the EU single aviation market and internationally. In some cases, they are faced in the global aviation market with competition that may be called unfair. Although a number of the EU's key trading partners have similar rules in place, this is not the case for all 3rd countries. Furthermore, there is today no international legal framework to deal with the issue of unfair competition in a global aviation market that would provide for regulatory instruments to tackle this type of practices. For as long fair competition cannot be achieved otherwise, an EU defence instrument would need to be available. Currently, this instrument is Regulation No 868/2004²⁴³, which will be discussed in detail further below.

That said, the EU is taking action in a number of tracks towards safeguarding a level playing field:

- The EU has developed a template "fair competition clause" which Member States systematically are encouraged to negotiate bilaterally for inclusion in bilateral air services agreements. The same approach is being pursued at EU level.
- The Aviation Dialogue with the six Gulf Cooperation Council States (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE) with a view to enhancing transparency and safeguarding a level playing field. The EU is discussing similar issues also in other dialogues including with ASEAN.
- On a multilateral level: a level playing field should be ensured in international air transport - a principle which has been recognised by ICAO. EU and ECAC States coordinate their efforts to support the on-going work by ICAO through the Air Transport Regulation Panel (ATRP).
- Work is being undertaken to revise or replace Regulation 868/2004 concerning protection against subsidisation and unfair pricing practices causing injury to EU carriers in the supply of air services from non-EU countries in order to make it more effective (see further details below).

²⁴³ Regulation 868/2004 of the European Parliament and the Council concerning protection against subsidisation and unfair pricing practices causing injury to Community air carriers in the supply of air services from countries not members of the European Community [OJ L 162]

9.2 Regulation 868/2004 in particular

Regulation No 868/2004 was adopted amid concerns about unfair pricing practices by US carriers on the transatlantic market following 9/11. So far no complaint has ever been lodged by EU air carriers under that Regulation despite frequent claims and concerns about unfair practices from third countries.

EU carriers and industry associations argue that there are fundamental difficulties in applying the Regulation as it has been modelled on tools used in anti-dumping for goods and is not properly adapted to the specificities of the air transport sector. For instance, the scope of Regulation 868/2004 is said to be too narrow to cover the full range of unfair practices, and the approach of the Regulation is on price undercutting on specific air routes that it is almost impossible to prove in view of the complexity of pricing by airlines. Moreover, the preferred remedy under Article 9 is duties imposed upon third country carriers, which are tools developed for trade in goods and are not tailored to air transport services.

Amidst allegations of unfair competition and subsidies in the global aviation market, many considered it important that the EU is equipped with an effective instrument to address, if necessary, substantiated concerns about unfair practices in international air transport. If the EU does not have such an instrument, it is argued, unfair practices by third country carriers or third countries could have a significant negative impact on the competitiveness of the EU aviation industry.

In its Communication on "The EU External Aviation Policy – Addressing Future Challenges", the Commission stated that there is a need to develop a more effective instrument to safeguard fair competition in EU external aviation relations. The Council, in its Conclusions adopted in December 2012, agreed that Regulation 868/2004 had proven not to address adequately the specific characteristics of the air transport sector and supported the Commission's intention to analyse possible options for developing a more effective instrument to safeguard fair competition and its intention, on that basis, to present a proposal for the revision or replacement of the Regulation.

Such instrument could be applied in cases of proven unfair practices negatively affecting EU companies (depending on the terms of the instrument, it could cover e.g. discrimination of EU air carriers, harmful and unjustified state subsidies by foreign governments or situations like those of the Siberian overflight charges). A possible new Regulation could play an important role also in promoting the EU policy of a level playing field at international level including the application of principles of fair competition law to international air transport. International obligations under bilateral Air Services Agreements will however be considered.

Having regard to a number of options, the new instrument could be based on the following elements and improvements:

- The scope of Regulation 868/2004 could be extended to cover a wider range of possible unfair practices with the effect of distorting competition in air transport to/from/within the EU;
- Regarding the procedural framework, the investigative tools could be reinforced so as to ease the collection of evidence; the requirements as regards the active legitimacy to bring a complaint and the evidence necessary to open an investigation could equally be reviewed as could be time limits and consultation mechanisms, etc.; and
- The available types of redressive measures could be reviewed and expanded; in this context, it may be explored whether as a measure of last resort, the suspension or restriction of the use of traffic rights could be applied until the matter is resolved.

CHAPTER IV

'HIGH STANDARDS FOR INSTITUTIONAL GOVERNANCE IN EUROPE'

1. Setting the foundation for a high standard Single European Sky institutional governance

Arguably the most important area where higher standards should be reached in terms of institutional governance is that of Air Traffic Management and the way in which the implementation of SES should be organised from an institutional perspective.

With the introduction of the SES, several new bodies were created under the overall EU framework to support the implementation of the SES provisions. The Network Manager for managing the key functions of the ATM network to allow for optimum use of the airspace, the Performance Review Body to assist the European Commission in setting up and managing the performance scheme for air navigation services, the SESAR Joint Undertaking to ensure the modernisation of the European air traffic management system by federating research & development efforts in the Community and the Deployment Manager for the governance of deployment projects emerging from SESAR research. Common rules in the field of civil aviation (Regulation (EC) No 216/2008) were extended to ATM in 2009, including all measures on technical rulemaking on ATM since 2012. In 2015, the European Defence Agency took up the role to facilitate the coordination of military views in the Single European Sky (SES), in particular in relation to the deployment of the SESAR project.

In addition to this evolving SES institutional framework, other organisations, in particular Eurocontrol for technical SES support, the European Organisation for Civil Aviation Equipment (EUROCAE), in the area of aviation standardisation, the European Civil Aviation Conference (ECAC) regarding general aviation coordination, NATO in the field of civil-military ATM issues and ICAO, both at Headquarters as well as in its regional office in Europe are important partners for the EU in the governance framework for SES.

Eurocontrol was nominated by the Commission as Network Manager for the ATM network functions until the end of 2019. A reform discussion is underway concerning the possible concentration of the organisation on a role as a centrally-run Network Manager, which operates various network central functions and services – many of them SES-related. This could enable the organisation to provide added value whilst reducing its overall costs and impact on the level of air navigation charges substantially. Steps have already been taken in this direction but there continue to be overlaps between the respective activities of the Union and Eurocontrol.

Technology will be the main driver in the development of the Single European Sky in the next two decades requiring the development of a common ATM architecture and the use of open technologies (non-proprietary solutions). Performance-based requirements necessitate adaptations to accommodate infrastructure and operational changes. In this process towards the rationalisation of ATM infrastructure through standardisation of ATC systems and global interoperability Europe may play a major role. ATM-related research will be driven by performance investigating innovative solutions in SESAR. A smooth integration of RPAS (drones) into European airspace and cybersecurity threats will require mitigation efforts.

2. High standards in cooperation and coordination between European aviation organizations

Improving the institutional set-up with regard to SES is not the only area where higher standards or more efficient cooperation can be pursued. Apart from the institutions which form part of the EU, there is also the European Civil Aviation Conference (ECAC), created in 1955 and bringing together the aviation authorities of 44 European countries. While in the past ECAC focused very usefully on drawing up policies and soft rules, which are voluntary, it is clear that in Europe the main framework for aviation policy formulation and the

development, adoption and implementation of rules is the EU. However, the ability of ECAC to bring the Director-generals for Civil Aviation together on a regular basis to discuss important aviation developments and coordinate within a voluntary framework remains important, and the Commission will continue to participate with ECAC in such activities.

A balanced relationship between the EU and the Regional Office of ICAO in Paris, which is accredited to the 56 ICAO Member States that form ICAO's EUR/NAT region, is also important, as the EU can help the ICAO Regional office to focus its efforts on its Eastern-most Members, where safety needs are biggest, and which are not covered by the EASA safety ecosystem. For issues of more general or strategic importance, the EU is best served by a direct relationship with ICAO's Montreal headquarters, which remains the place where all strategic ICAO decisions are taken, including notably with regard to the global aviation standards which ICAO develops.

With regard to ICAO, as the aviation sector is growing faster in other regions than in Europe, there could be a risk for Europe to lose part of its traditional influence at ICAO, which would be detrimental to the interests of the European aviation industry, including in particular its aeronautical industry. Such loss of influence is however not inevitable, on the condition that full attention is paid to the standard setting of ICAO, where European views should as much as possible be expressed with a single voice. Moreover available expertise should be pooled to the maximum effect possible.

CHAPTER V

'STRENGTHENING EUROPEAN AVIATION THROUGH RESEARCH, INNOVATION AND INVESTMENT'

1. Introduction

The EU strives to raise its competitive position in global aviation; investment in research and innovation is crucial to achieve. In 40 years the European aeronautic industry has collectively succeeded to rise from a niche sector to a world leading industry. Research, innovation and European collaboration have been key ingredients in the recipe for conquering global markets.

Many innovations in aviation today stem from investments in research in previous decades. Some of the innovations spin then out to other sectors. Aviation is a high-technology sector which combines extraordinary demands on research and innovation with long lead times. Decisions in research and technology development can have considerable consequences on the aviation sector decades afterwards.

More global demand, more emerging competition and more environmental, safety and security requirements put pressure on European manufacturers and service providers, in order to deliver more advanced products and services in less time and with less costs. This trend has led to higher and more integrated research & innovation investments in the European aviation sector. EU-wide 'high standard' research and technology development programmes are instrumental in this context and their concrete results are increasing.

This is particularly true for the technology pillar of the Single European Sky, SESAR, whose deployment phase was activated in 2013 and continued throughout 2014 and 2015. SESAR is based on a common and innovative concept of Air Traffic Management (ATM) operations, whose components are defined, developed and deployed according to a common roadmap and through dedicated governance, incentive mechanisms and partnerships involving EU bodies and stakeholders. Concretely, it enables deploying advanced technologies in view of a highly performant Air Traffic Management system, especially, in terms of greater cost and flight efficiency, obtained through defragmentation of systems and technological innovation.

Another unique EU Public-Private Partnership is Clean Sky JTI (Joint Technology Initiative) bringing together industry, universities and laboratories. This partnership is developing, maturing and demonstrating breakthrough technologies for the civil aircraft market to cut aircraft fuel consumption, emissions and noise.

Furthermore new types of aircraft, such as RPAS, are called to be safely integrated into the European airspace.

The use of Information and Communication Technologies (ICT) in air transport will be deployed and optimised to better serve the passenger and the efficiency of service provision. The EU Digital Agenda and the competitiveness Agenda promote flagship technologies such as big data, graphene, robotics and automation and key emerging technologies. They will play a fundamental role in achieving a highly automated and interconnected aviation sector where new ICT tools and services facilitate data exchange and decision-making. Big data technology, for example, can contribute to competitiveness by improving passenger experience and inter-modality. Big data will also contribute to the build-up of System Wide Information Management (SWIM²⁴⁴), the "aviation intranet" interconnecting different aviation stakeholders and enabling safer and more secure trips by managing greater amounts of information.

²⁴⁴ <http://www.sesarju.eu/sesar-solutions/swim>

All in all, such innovative solutions will reconcile the expected growth in air traffic with more cost-effective, competitive and sustainable operations and services. The goal will be to go well beyond a technological revolution towards a service revolution that offers new travel experiences for passengers and businesses.

The international dimension of innovation is also of paramount importance to maintain Europe's industrial leadership. Aviation has inherently and increasingly an international dimension. Globalisation poses challenges and opportunities for European aviation production and operation. Improved scientific cooperation and shared objectives in areas of mutual benefit with key third countries and international organisations can streamline efforts and contribute to the promotion of EU/global standards and interoperability (i.e. ICAO,²⁴⁵ the United States' NextGen²⁴⁶ project).

2. Flightpath 2050 and strategic research and innovation agenda (SRIA) recommendations

In 2011 the Commission published its White Paper on Transport setting out a vision with goals for European transport to achieve by 2050. The Commission convened a High Level Group on Aviation Research, composed of key stakeholders of European aviation from the aeronautics industry, air traffic management, airports, airlines, energy providers and the research community, to jointly develop "Flightpath 2050: Europe's Vision for Aviation"²⁴⁷. This document not only shared the main aspects of the White Paper but developed them further from the perspective of aviation research and innovation. It focused on two main ambitions: meeting the needs of EU citizens and the market as well as maintaining global leadership.

Flightpath 2050 addressed customer orientation and market needs as well as industrial competitiveness and the need to maintain and ensure an adequate base of skills, talent and research infrastructure in Europe. It also underlined the need for an innovation-friendly environment relying on strong, sustainable and coherent investment in research and innovation and enhanced governance, funding and financing structures. It also identified the need to overcome those challenges thanks to a new strategic roadmap for aviation research, development and innovation, which would account for both the evolution of technology and technology step changes: the Strategic Research & Innovation Agenda²⁴⁸ (SRIA) was created.

The Advisory Council for Aviation Research and Innovation in Europe (ACARE²⁴⁹) published the SRIA in 2012. The strength of ACARE lies in its membership involving the whole air transport and aeronautics community, as well as national and EU authorities. The two volumes of the SRIA provide a comprehensive set of enablers, capabilities, targeted achievements and timelines for research and innovation activities to meet the challenges and goals spelled out in Flightpath 2050. The key messages of both documents for 2050 are summarised as follows:

Meeting market and societal needs

Passenger experience is paramount and in 2050, air transport is "at the heart of an integrated seamless, energy efficient, diffused intermodal system taking travellers and their baggage from door-to-door, safely, affordably, quickly, smoothly, seamlessly, predictably and without interruption"²⁵⁰. Flightpath 2050 sets several quantitative targets for 2050:

²⁴⁵ <http://www.icao.int>

²⁴⁶ <https://www.faa.gov/nextgen/>

²⁴⁷ <http://ec.europa.eu/transport/modes/air/doc/flightpath2050.pdf>

²⁴⁸ <http://www.acare4europe.com/sria>

²⁴⁹ <http://www.acare4europe.org/>

²⁵⁰ <http://ec.europa.eu/transport/modes/air/doc/flightpath2050.pdf>

- 90% of travellers within Europe are able to complete their journey, door-to-door within 4 hours.
- Flights land within 1 minute of the planned arrival time.
- An ATM system is in place that provides a range of services to handle at least 25 million flights a year of all types of aircraft.

The SRIA answer to these targets proposed the design of a customer-centric intermodal transportation system in which air transport is completely integrated. An innovative travel process may provide the customer with a single paperless ticket for his entire journey as well as travel information capable of delivering robust, relevant, complete and unbiased travel choice before and during his travel.

Maintaining and extending industrial leadership

"In 2050, the innovative, sustainable and highly competitive European aviation industry has cemented its place as the world leader. It is recognised globally for its vehicles, engines, services and a large range of very cost-effective and energy-efficient products". Some of the quantitative targets set for 2050 are:

- The whole European aviation industry has a share of more than 40% of its global market;
- Streamlined systems engineering, design, manufacturing, certification and upgrade processes have addressed complexity and significantly decreased development costs (including a 50% reduction in the cost of certification).

SRIA proposes the continuous research and development on new technologies (new aircraft and their demonstration and test flights) underpinned by a focussed investment and more efficient certification of aviation products. At institutional level, it asks for a fair and balanced set of global regulations and standards to create a level playing field and for new business models and incentives to accelerate innovation.

Protecting the environment and the energy supply

"In 2050, the effect of aviation on the atmosphere is fully understood. A combination of measures, including technology development, operational procedures and market-based incentives mean that its environmental impacts have been mitigated at a rate outweighing the effects of increasing traffic levels". In 2050, among other objectives:

Technologies and procedures available will allow a 75% reduction in CO₂ emissions per passenger kilometre and a 90% reduction in NO_x emissions and the perceived noise emission of flying aircraft will be reduced by 65% (compared to the capabilities of typical new aircraft in 2000).

Aircraft movements are emission-free when taxiing and aircraft are designed and manufactured to be recyclable.

SRIA proposes several enablers, including affordable, sustainable, alternative energy sources for commercial aviation, which will depend on liquid hydrocarbons for at least several decades.

Ensuring safety and security

"In 2050, European aviation has achieved unprecedented levels of safety and continues to improve. Manned, unmanned, legacy and next generation, RPAS and all types of rotorcraft operate simultaneously in the same airspace. Security processes for air travellers are nonintrusive, preserve privacy and personal dignity and are free of interruption and delay. Aviation security is integrated across all modes of transport and is based on the

three principles of resilience and effectiveness; passenger experience; and fast, integrated and seamless processes".

The SRIA insists on the need for improved understanding of safety and security (including cyber threats), expectations from society and the need to ensure privacy and dignity. It also expects a successful design, manufacturing and certification process to include safety and security at all stages and the need to carefully address the role of automation in the context of RPAS and human factors.

Prioritising research, testing capabilities and education

Flightpath 2050 envisions among others:

- European research and innovation strategies jointly defined by all stakeholders, public and private, and implemented in a coordinated way covering the entire innovation chain.
- A network of multi-disciplinary technology clusters based on collaboration between industry, universities and research institutes.
- Strategic European aerospace test, simulation and development facilities – identified, maintained and continuously developed. Ground and airborne validation and certification processes integrated where appropriate.
- Students are attracted to careers in aviation and lifelong and continuous education in aviation is the norm.
- Outcomes of research initiatives will lead to more focussed research linked to such outcomes especially as regards safety (EASA-led), following the example of ATM research.

EASA will support the Commission in the definition and accomplishment of the relevant Union framework programmes for research and innovation activities.

Notwithstanding the dynamic and quickly changing global competitive environment, the comprehensive work accomplished by Flightpath 2050 and SRIA is sound, updated and valid even today. The long term challenges remain and Flightpath 2050 and SRIA recommendations, steered at the service of competitiveness, will help the European aviation community to lead the world in sustainable aviation products and services, meeting the needs of EU citizens now and in 2050.

On this basis, the Commission is already engaged to continue to further develop inclusive and extensive EU-wide research & innovation programmes able to set common objectives across the whole aviation community, incorporating activities from basic research to flight tests and coordinating research, standardisation, regulatory bodies and industries. A good example in this direction is the EU Framework Programme for Research & Innovation Horizon 2020, including SESAR 2020 and Clean Sky 2 initiatives. Closer involvement of end-users and closer coordination among different initiatives and entities can be further sought, inside and outside aviation, with spill-over effects from other sectors (e.g. space, surface transport, ICT, etc.) – also among public agencies such as EASA on safety and the ECHA for an efficient implementation of the REACH Regulation.

The research and innovation programmes are also projected to be evaluated on measurable performance-oriented basis. Furthermore, it is necessary to further anchor policy actions with deployment through R&D, ensuring a reliable long-term strategy able to provide confidence for the required funding and investments, and promote more inter-industry collaboration, where aviation services could become more cost-effective or provide innovative services.

3. Modernisation of ATM through SESAR Research and Deployment

A crucial activity for air transport is ensuring that aircraft and their passengers and crews are guided safely and in a timely manner through the sky and on the ground and that airspace is managed to accommodate the changing needs of air traffic over time, through ATM. In this connection the SESAR programme – the technology pillar of the SES – represents the main tool Europe has at hand to move towards a highly performant ATM system, in particular, in terms of greater cost and flight efficiency, obtained through defragmentation of systems and technological innovation.

Current forecasts indicate that air traffic is expected to grow up to 50% from now to 2035, which will represent 14.4 million flights a year. However, already today, ATM in Europe has a number of shortcomings due to significant fragmentation of the airspace. Yearly air navigation service costs in the Union amount to €8 billion, which on a comparable basis is 50% higher than in the United States. Already today, congested key hub airports are facing challenges to accommodate growing traffic, which is enabling the growth of carriers outside the EU. Fuel efficiency is critical for cost and environmental reasons and increasing traffic and variety of airspace users (commercial, business, leisure aviation, drones) makes it harder to ensure safety. This fragmentation generates serious consequences for the sustainable growth of the aviation sector and the competitiveness of the EU's air transport. Without a radical change in the way air traffic is managed, the capacity of systems in Europe will reach their limits leading to more delays for passengers, increased costs for airlines and higher CO₂ emissions.

Since 2004, the EU has set out to improve the performance of ATM in Europe by reforming the way air traffic is managed and organised in Europe through the SES initiative. The main challenge is in fact to overcome the detrimental fragmentation of systems and to create the right conditions allowing the pooling of efforts and investments to implement and manage change in a complex and traditional slow-to-innovate environment such as ATM.

The SES has two tools that are demonstrating their capacity to make change in ATM happen:

- A dedicated and evolving legal framework²⁵¹, and
- Cooperative mechanisms that actively involve civil and military stakeholders

In this framework, the EU has set up and is running the SESAR programme. SESAR aims to modernise and harmonise ATM from a technological and operational perspective, thus contributing to the overall SES performance objectives. It is based on a common and innovative concept of ATM operations (SESAR Concept of operations) in which the users of the airspace and controllers define together, through a collaborative process and more efficient exchange of information, the optimal, predictable and timely flight path for aircraft. The components of this concept are defined, developed and deployed according to a common roadmap (the new 2015 SESAR ATM Master Plan 2015²⁵²) and through dedicated governance, incentive mechanisms and partnerships involving stakeholders and EU bodies. Other solutions being supported and developed are SWIM²⁵³, the extension of automation to ground services and Remote Control Towers. Support for the continued development of innovative solutions in the field of ATM was significant in the public consultation, including automated air traffic control and free routing.

ATM modernisation is also a global issue. There is therefore, a great potential to export SESAR concept and underlying technologies in third countries for the advantage of competitiveness of European air transport and

²⁵¹ http://ec.europa.eu/transport/modes/air/single_european_sky/index_en.htm and http://ec.europa.eu/transport/modes/air/single_european_sky/ses2plus_en.htm

²⁵² <https://www.atmmasterplan.eu/>; www.eatmportal.eu.

²⁵³ <http://www.sesarju.eu/sesar-solutions/swim>

aviation industry and to favour harmonisation and interoperability at global level. SESAR Solutions are based on innovative technologies and operational procedures that are developed and validated by European air and ground manufacturers, software developers, universities, civil and military airspace users, airports and service providers. Through SESAR, these stakeholders have gained an influential position in international standardisation fora and a leading position on the global market.

All in all, SESAR is a flagship project of the EU contributing to several Commission priorities, among which:

- Boosting jobs, growth and investments through its embedded public-private partnerships, promoting new skills, innovation and safe integration of new technologies, facilitating connectivity within Europe's regions and supporting European industry:
 - For the definition phase of SESAR, €30 million²⁵⁴ was invested, followed by €1,285 billion²⁵⁵ for the development, including the establishment of the SESAR Joint Undertaking (SJU). €40 million²⁵⁶ was invested in the SESAR Deployment Framework, including establishing the Deployment Manager (DM).
 - It has been estimated that the timely deployment of SESAR Solutions can potentially result in over 300,000 new jobs²⁵⁷ based on an investment of approximately €5 billion for SESAR deployment of which 50% is co-financed by the EU. Within the overall SESAR programme budget, research on drones is also included.
- A Digital single market, by developing and deploying integrated and interoperable networks and addressing data protection and cybersecurity;
- A Resilient Energy Union by contributing to fuel savings and a potential reduction of 50 million tons of CO₂²⁵⁸ emissions;
- A Deeper and fairer internal market by developing industry standards, promoting labour mobility and good industrial cooperation;

By 2035, it is expected that the SESAR concept of operations will have been deployed throughout the European ATM Network and expected gains in performance will be seen. The ambition is to enable a reduction of ATM costs per flight by ~50% by 2035, representing a reduction of €3 billion per year compared to 2012. Moreover, SESAR solutions could allow accommodating over 700,000 more flights a year (2,000 flights/day) in congested airports.

Moreover, thanks to the timely deployment of SESAR solutions, the European air transport industry will continue to enjoy a prominent position worldwide and European systems with those of other regions of the world will be fully interoperable.

Nevertheless, SESAR is not a standalone initiative and can only be successful if we are able to maintain and intensify the buy-in of the ATM industry at large, supporting the project with a consistent and effective legal framework and incentives that are capable of accommodating both EU policy and stakeholder needs. It is therefore necessary that SESAR mechanisms are fully coordinated and interconnected with the other SES mechanisms by better integrating them in the SES legal framework.

²⁵⁴ €30 million as a grant from the TEN-T programme (2004).

²⁵⁵ €350 million contribution from the Seventh Framework Programme (FP7) 2007-2013; €350 million contribution from the TEN-T programme (2007-2013); €585 million contribution from the Horizon 2020 (H2020) programme (2014-2020).

²⁵⁶ €40 million through grants (Programme Support Action) to the SESAR Deployment Manager from the Connecting Europe Facility (CEF) programme (spread over the period 2014-2020) amount included in the 2014-2020 CEF MAP (Multi-Annual Work Programme).

²⁵⁷ Source: Study on the macro-economic impact of SESAR, SESAR Joint Undertaking, June 2011

²⁵⁸ Source: Study on the macro-economic impact of SESAR, SESAR Joint Undertaking, June 2011

4. Development of new types of aircraft and air vehicles

Alongside the innovation to modernise European airspace and its management, the development of new types of aircraft and 'air vehicles' is also paramount. Collaboration between manufacturers, airlines, academic partners, policy-makers and certification bodies is driving innovation when it comes to new aircraft technologies.

At first sight the external design of existing aircraft does not differ significantly to those manufactured a few decades ago. However, a technological revolution has taken place in the meantime. Computer controls and fly-by-wire systems are now the norm for use by pilots. Lightweight plastics and composite materials have increasingly replaced metals, decreasing operational costs related to maintenance and fuel consumption. Although modern aircraft are far more efficient than those built 60 years ago, aviation fuel costs account for approximately 35%²⁵⁹ of airline expenses. Moreover aviation needs to decouple its carbon footprint from its rapid traffic growth if it is to achieve the ICAO goal of carbon neutral growth for 2020. As a result, demand for more fuel efficient aircraft with less emission remains one of the main drivers. The development of new breakthrough technologies for the civil aircraft market can be seen as a way to help secure the future international competitiveness of the European aviation industry.

Aircraft operations today are 75% quieter than they were 50 years ago. New aircraft types offer significant noise reductions compared to their predecessors. Further design improvements such as blended wing body and engine-shielding by fuselage and tail plane offer the potential to reduce perceived noise from aircraft by 65% by 2050.

The EU's Clean Sky Joint Technology Initiative (JTI) was established in 2008 as a unique Public-Private Partnership between the European Commission and industry, bringing together industry, universities, and laboratories²⁶⁰. This partnership is an example of an initiative aiming at developing and demonstrating new breakthrough technologies for the civil aircraft market to cut aircraft emissions and noise. Clean Sky has so far developed and demonstrated technologies underpinning innovative engines as the Open Rotor, laminar wings, innovative rotor blades and high compression engine for light helicopters, innovative ice detector sensors and advanced avionics systems among others.

New airframe shapes to increase lift and decrease drag will also make aircraft more environmentally friendly. To make a major difference towards decreasing fuel consumption and engine noise, aircraft will need radically new propulsion systems mounted or integrated into the airframe in novel ways. There is an increased interest amongst manufacturers and operators of commercial aircraft to move towards more electric aircraft and hybrid electric aircraft. The basic idea is to use fuel turbo-engines when taking off and turbine-electric motors while on cruise. Studies in this area confirm the potential for small and middle size aircraft in case the electrical power components and storage systems are substantially improved in terms of weight and performance.

Aircraft manufacturers will also continue to address customer and market needs. In the future, for example, commercial supersonic flights could again be a reality in the next decade and even hypersonic flights at a later stage with non-conventional fuels. Fuel efficiency, a larger market, more routes (such as those over land), and eliminating sonic booms are all important for making supersonic flight viable. A Supersonic Task Group is already in place at ICAO, monitoring research and commercial developments efforts worldwide, with a view to future noise-based standards for sonic boom acceptability. Affordable supersonic flights over land could open the airline industry to new possibilities and push development to the next stage.

²⁵⁹ Facts and Figures, Air Transport Action Group, March 2012.

²⁶⁰ <http://www.cleansky.eu/content/page/towards-clean-sky-2>.

4.1 Safe development of drone operations

Unmanned aircraft have been considered a possibility since decades. Their existence is acknowledged in the Chicago Convention, which regulates international civil aviation since 1944. In reality such aircraft have until recently been used almost exclusively by the military. Technological progress has now reached a point where civil aviation applications have become technologically feasible and economically viable, similarly to the arrival of autonomous vehicles in other transport modes. It is the combination of innovation in ever lighter and stronger materials, software development, data processing and miniaturisation at ever lower cost which makes this development possible.

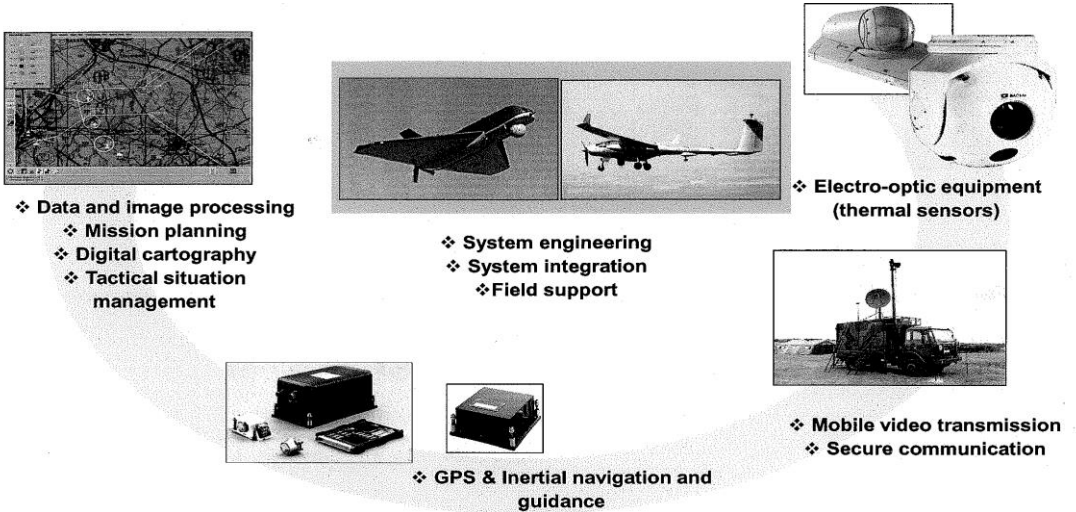


Chart 18 The bundle of drone technologies

Source: Safran presentation, 2015 ²⁶¹

In particular the category of remotely piloted drones, called Remotely Piloted Aircraft Systems (RPAS), has been expanding rapidly in recent years. Just as the productivity of many jobs now depends on internet or mobile phone use, drone services will become an important tool and part of many businesses, supporting the competitiveness of various industries. The most obvious sectors where drone applications have already started are agriculture, television and movie industry, and aerial services such as inspections of pipelines, railway lines or electric lines. Drones will also become integrated in transport and logistics chains. Finally, there are more innovative sectors, such as energy provision or satellite coverage where drone operations may enable new methods of production and delivery. In the longer term, drone technology may not only enable new applications but also transform air transport itself, as technologies steadily take over more and more tasks from humans also on large aircraft. Drones thus carry the promise of a disruptive technology, opening up previously impractical unavailable or uneconomical aerial applications and replacing existing services at a substantially lower cost.

Drone manufacturing, operation and maintenance are likely to see strong growth. Together with the contribution of new drone services to the competitiveness of other sectors, a strong direct and indirect impact on growth and jobs may be expected. The market for small (civil) drones is expected to evolve rapidly with robust growth figures in the coming years, estimated between a few hundreds of millions to several billions per year.²⁶² The evidence of the studies varies significantly as they significantly differ in scope of the markets considered (small/large, civil/military, pure platform manufacturing/payload or associated services such as cartography) and in time horizon. Several studies also take the introduction of drone rules as a condition for the market to take off. There is no study known which takes the productivity in user industries into account, like the transition from fixed lines to mobile phones improved the productivity of so many workers in the overall economy. In all, the available studies all foresee a rapid growth of drone operations, depending on the introduction of clear rules.

²⁶¹ This chart represents military equipment, but is of course also applicable to commercial operations.

²⁶² There are numerous forecasting reports available on the market.

The full potential of drones will only be realised if they can safely fly in non-segregated airspace – alongside manned aircraft.²⁶³ This is not the case today, as drones face operational restrictions and diverging national standards. A number of other legal, operational and technical issues linked to the civil use of drones, like liability and data protection, also hamper their deployment. The challenges were identified in the Commission’s policy document on drones of 2014.²⁶⁴

There are two important challenges for the further development of drones. The first is that the existing aviation rules were conceived for large manned aviation. Drones are incapable of meeting some of the most basic requirements and underlying assumptions, such as having a pilot on board or taking off from a traditional airport. In the absence of a dedicated legal framework for drones, drone operations must be allowed to derogate from the standard rules by means of individual authorisations. This approach is not sustainable once the number of drone manufacturers and operators starts to grow, as the authorisation is resource-intensive and costly.

The second challenge is to deal with the issues that drone operations present a number of issues which are not, or much less, present in civil aviation in general. They concern the correct application of rules in the areas of safety, security, privacy and data protection, environmental protection, and liability.

Although drones do not carry people on board, a drone crash may, depending on the energy involved in the crash, kill or injure people on the ground or in other – manned – aircraft. Several events of drones flying in close proximity with other aircraft have been reported and have caused concern amongst the pilot community and the public. These risks are compounded by the increasingly large numbers of drones expected to be operated in the future.

Drones can invade privacy in ways which other aircraft cannot do, by flying very close to persons or into their “private space” such as a home garden. Moreover, many drones carry recording or sensing equipment, be it for navigation or for the purposes of photography or remote sensing. The data captured by that equipment is likely to be stored and/or processed, raising data protection issues.

Most drones rely on electrical power; therefore emissions are not an issue. However, as drones operate close to people and their number may grow strongly, noise may potentially become a nuisance. Specific drone noise standards and/or operating restrictions may be called for.

Accidents with drones will happen, which raises the question of dealing with damage to people and property. Liability and compensation regimes are well established in the world of air transport, but if drones operate outside those regimes, liability and compensation may become an issue. Also, contrary to traditional aircraft, which are all registered, it may currently not be possible to establish the identity of the owner/operator of a drone.

If the underlying issues are not addressed, the public may resent drone operations, and put pressure on the political leadership to impose strong restrictions on drones which could be avoided if the risks are addressed early on and occurrences are prevented to the extent possible. Strong restrictions are likely to keep the development of drone-based services below their potential, leading to missed business opportunities and thus foregone jobs and growth.

²⁶³ Small drones are though unlikely to be equipped with the necessary safety features such as detect&avoid capabilities, so that their segregation would appear necessary.

²⁶⁴ COM(2014)261 on a new era for aviation – Opening the aviation market to the civil use of remotely piloted aircraft system in a safe and sustainable manner

The industry and Member States are strongly requesting rapid action from the regulator to solve those problems.

Several Member States have already adopted drone rules – mostly for the smaller category below 25kg and non-complex operations. While national rules allow expertise to grow, these rules are diverging so that the internal market becomes fragmented. Such fragmentation hampers the development of new products and the swift introduction of technologies. EASA Regulation 216/2008 makes the EU competent only for drones weighing above 150kg.

One possible approach to the integration of drones into the EU aviation system would be risk-based. Its starting point would be the risk of a particular (type of) operation. It would allow for regulatory differentiation from low risks to risks equivalent to 'manned' aviation, and thus for scalable rules which are proportional to the risk.

The implementation of such approach could imply an amendment to Regulation (EC) No 216/2008 and present itself as follows:

For the highest risk operations, such as drones operating from airports and in the same airspace as manned passenger transport aircraft, the rules and procedures would be equivalent to the conventional aviation approach, entailing formal certification and licensing by aviation authorities. In addition to certification of the aircraft, certification of the operator and licensing of the pilot, scalable rules should be introduced that reflect the range of risk profiles in different operations and would enlarge the range of verification measures with more flexible instruments that are suited to apply to low risk operations, such as operator declarations instead of certificates.

Finally, SESAR has produced a working programme to identify the R&D actions required to integrate drones into the aviation system (Detect&Avoid, Command&Control, human factors, security, contingency, etc.). Coordination is further ensured with the European Defence Agency, European Space Agency and between other Commission services.

This initiative is linked to the EU's internal market, jobs, growth and investment, and the EU as a global actor. The above mentioned approach would be in line with the European Parliament's own initiative report²⁶⁵

4.2 Improving certification as gate from research to innovation.

It is important to shorten time-to-market and to decrease costs of development and operation of new air transport products and services, notably for market-creating innovations. This would help increase the European share in the fast-growing global market despite the emerging competition.

The cycle from preparation to completion of certification tests of large aircraft can take more than 5 years. Delays in delivering new aircraft to an airline can lead to substantial penalties to the manufacturer, or cancellation of orders to the benefit of competitors. Furthermore, a design issue only detected at a late stage may further increase the development costs, as the cycle design-build-test-redesign drives the delays and the development cost – already in the order of several billion € for modern commercial aircraft.

For new aircraft products, operations and services certification is the gate from research & development to market uptake, as compulsory guarantee of safety and environmental compliance. The cost, time and uncertainty related to certification are important factors in preparing new products and services. EASA is in charge of most

²⁶⁵ European Parliament, 2014/2243(INI), "Safe use of remotely piloted aircraft systems (RPAS), commonly known as unmanned aerial vehicles (UAVs), in the field of civil aviation", adopted on 29 October 2015.

certification cases in Europe, including for products and services derived from technologies developed in EU programmes.

EASA participation could be facilitated in earlier R&D stages with a view to avoiding issues to emerge later at the certification level. Issues at certification would increase costs and delays, putting at risk orders, endangering market penetration and the return on investments for European companies.

EASA early involvement would be particularly important in EU multi-billion € programmes supporting aviation research & innovation, deployment and investment e.g. Horizon 2020 (including CleanSky2 and SESAR2020 JTIs), Connecting Europe Facility (including SES Deployment) and Structural Funds (20 EU regions include aeronautics among the targeted sectors).

Furthermore, research underpins the new certification processes and the new regulations, including those adopted internationally – ICAO – where EASA is called to play a more active role to contribute technical expertise. The supporting technical evidence put forward firstly by one country or group of countries can be influential in the final decision.

5. Digitalising European aviation to the benefit of both cargo and passenger transport

The Digital Single Market Strategy adopted on 6 May 2015 includes a set of targeted actions built around three pillars: (1) better access for consumers and businesses to digital goods and services, (2) creating the right conditions and a level playing field for digital networks and innovative services to flourish, (3) maximising the growth potential of the digital economy.

The Commission recently launched a project to set up the Digital Transport and Logistics Forum. The core of the proposed policy is the optimisation of the use of ICT in transport, traffic management and logistics. Indeed, the issues are relevant for both cargo and passenger air transport: (1) use of available data to support new business opportunities and to improve the use of existing resources (data exchange standards and infrastructures across modes,) data protection, cybersecurity, critical mass of stakeholders sharing data), (2) better transport assets management (again, data issues), (3) reduction of administrative costs (harmonisation of standards, common format for data exchange across modes, e-transport documents). This effort will draw upon and contribute to the Digital Single Market initiative of Free flow of data, which aims to maximise innovation potential within and across industrial sectors.

5.1 Improving infrastructure and service provision by deploying and optimising the use of ICT

With regard to passenger transport in the next 10-15 years, the longer term vision for the full deployment of ICT through digitalisation of the sector would be a totally integrated travel experience from searching and booking online until obtaining travel feedback that includes all modes of transport used, including airports, to make a 100% seamless experience for the passenger. The cargo business will be genuinely intermodal and the cost of inter-modality will also decrease thanks to the utilisation of ICT. This shift to inter-modality will require that existing air transport infrastructure is utilised more efficiently and at a reduced cost. Digitalisation will play a key role in the modernisation of the aviation transport sector.

It is in this context that a digital aviation policy could be developed and revolves around two basic themes: infrastructure investment and lifting barriers for the provision of transport-related services. These themes are relevant to three areas of the aviation policy: aviation as part of an inter-modal transport system, airport performance and distribution of air transport services.

Where infrastructure is available, ICT is at the forefront in creating a seamless passenger experience, enabling a door-to-door service and single ticketing (e.g. combination air and rail fare). Lifting barriers for the development of new (combined) transport products will mean tackling issues such as data exchange infrastructures (clouds, platforms), data protection, data quality, cyber-security and collection of a critical mass of stakeholders sharing data, which would enable the development of such new products. These issues are at the core of the work of the Commission on passenger multimodal journey planners²⁶⁶, which identified that access to good quality data, interoperability, and data exchange protocols as the main obstacles for development of such products.

The deployment and optimisation of the use of ICT is also relevant for the Commission's work on airport capacity, performance and quality. Certainly, SESAR plays a pivotal role in improving the airside operational performance, also thanks to the deployment of ICT.

Sharing data, interface between various data infrastructures and data protection could improve airport performance landside as well as for communication within the ATM network.

The passenger experience at airports is also enhanced by ICT: digital services will be at the core of improving airport services in the future, contributing to the development of new business models (ancillary services provided at airports), airports' competitiveness and profitability. In the public consultation, respondents supported flow automatisation at airports and encouraged airports to develop smartphone applications to improve passenger experience. Further digitalisation was clearly desired.

The market of airline ticket distribution is clearly a prime example of advanced deployment of ICT in the transport sector. Airlines pioneered electronic distribution of their products, and data infrastructures and standards have existed in the airline sector for decades. The companies running computerised reservation systems such as Amadeus, Sabre and Travelport are technological leaders in ICT applications in the transport and logistics sector, also beyond passenger air transport. In this respect, their experience will be central to the development of any digital transport agenda.

The analysis of the answers regarding the Code of Conduct for CRS provided during the public consultation shows that opinions of stakeholders vary, some considering it still being appropriate, others found that some level of change may be needed.

The Code of Conduct for CRS, as it stands today, does no longer reflect entirely market reality. The market situation, which led to the creation of the Code of Conduct (notably the vertical integration between reservation system providers and airlines and their very significant market presence), has changed. Also, technology has come a long way since the adoption of the Code in 2009. A number of online travel agents provide flight search and booking facilities. Meta-search engines which offer search and comparison of air fares, hotel prices, etc., but do not allow bookings have emerged. To rationalise costs, airlines tend to distribute a larger share of their products directly and some of them work towards standardisation of the distribution of their products and/or invest in new specific tools (e.g. IATA's New Distribution Capability). In 2013, at the time of the Fitness Check, the Commission's view was that the relevant marketing and technological evolutions were still in progress and needed to stabilise before taking any decision on a possible need for regulatory initiatives. During the recent public consultation, travel agents and CRSs representatives claimed that new digital players should be subject to the same or similar regulatory requirements in terms of neutrality and transparency as CRSs.

²⁶⁶ "Towards a roadmap for delivering EU-wide multimodal travel information, planning and ticketing services", published on 16 June 2014, SWD (2014) 194 final.

Under its Digital Single Market strategy, the Commission announced that "...it will look into the growing importance of online platforms (search engines, social media, app stores, etc.) for a thriving internet-enabled economy. This includes looking at how to strengthen trust in online services through more transparency, how to include them in the online value chain, and to facilitate the swift removal of illegal content."

5.2 Improving safety risk assessment through an Aviation Big Data project

Civil aviation is a strategic sector where Europe excels and has a technological and market lead in airplanes but also in Air Traffic Management systems and there are significant prospects for growth. However as traffic increases so do concerns about safety. Enhancing further safety (bearing in mind that a status-quo of the accident rate combined with the forecasted increase of the traffic would mechanically mean more fatal accidents) requires to identify and assess systemic safety risks ("know where to look") as well as emerging safety risks ("see it coming") in aviation.

The data necessary to perform this risk identification do exist. The main data are the incident reports made by pilots or other professionals, flight parameters which are recorded by the airplanes for each flight, radar data generated by Air Traffic Control and weather data. However, not only are these data scattered and fragmented all over different organisations (industry and authorities) in Europe but there is no global and coordinated efforts to analyse them to provide a global view.

Collection and analysis of data at European level is necessary in order to reach the critical mass of data as well as the right scope of visibility bearing in mind that manufacturers and airlines have long organised themselves beyond national borders.

The Big Data technologies applied to Civil Aviation would enable to assemble the aviation safety data and provide serious analytical capacity at the required level. The necessity to have a centralised system and to ensure that the data are used for safety only (guarantee without which the data owners, primarily the airlines, would not accept to share their data) call for a management by an independent authority that EASA can embody (sole aviation authority at European level that can guarantee that data will not be used for commercial purposes)

EASA has conducted a Feasibility Study that shows that such a system is feasible and must be based upon a strong cooperative partnership between aviation authorities and industry.

The project set-up encompasses data exchange functionalities, data processing organisation, including IT solutions and analysis and reporting functionalities, and a collaborative governance structure involving different stakeholders. A gradual implementation is foreseen, the first step being the implementation of a proof of concept with a limited number of stakeholders involved, during which the technical architecture, data analysis and organisation will be developed. Over time, more stakeholders will be involved, and thus the Partnership can be built on the foundations laid by the proof of concept phase.

EASA, supported by the Commission, will launch a comprehensive project to enable a significant analysis and sharing of large amounts of data, helping to improve safety in aviation through the use of ICT. JRC will assist in this exercise. Availability of this data is a prerequisite for the development of a performance/risk-based regulatory framework.

6. Alternative fuels for aviation

FlightPath 2050 envisages Europe established as a centre of excellence on sustainable alternative fuels, including those for aviation, based on a strong European energy policy. In such a future scenario "environmental protection has been and remains a prime driver in the development of air vehicles and new transport

infrastructure. In addition to continuously improving fuel efficiency, the continued availability of liquid fuels, their cost impact on the aviation sector and their impacts on the environment, has been addressed as part of an overall fuel strategy for all sectors.

Aviation continues to exploit liquid fuels, prioritised by operational and technology considerations. Producing liquid fuels and energy from sustainable biomass has become an important part of the energy supply. A coordinated approach to fuel development is taken across the sectors that are highly dependent on liquid hydrocarbon fuels: aviation; marine and heavy duty transport and is a key part of managing carbon dioxide emissions from the transport sector as a whole. The development and market deployment of advanced drop-in biofuels can create a substantial amount of indirect jobs and in the long-run will help to maintain competitiveness of the European Aviation Industry by diversifying the fuel feedstock basis.

These Research and Innovation (R&I) projects financed through Horizon 2020 are investigating several pathways for the demonstration of the entire value chain including supply, of production and use of 2nd generation biofuels with volumes of the order of 1000 tons/year. This option has clearly the potential to reduce significantly greenhouse gas emission from aviation but to go one step further, pilot plants are needed with a production capacity in the range of 10,000 tons per year, a challenge which is addressed in the Horizon 2020 Work Programme 2016-2017 Secure, Clean and Efficient Energy. This will need a clear support from the aviation community as well as innovative means of financing since R&I funds will be insufficient to support initiatives of that scale. Also, a clear and long term perspective must be in place to convince investors to engage in long term initiatives.

ANNEXES

Annex 1

Freedoms of the air²⁶⁷

First Freedom of the Air - the right or privilege, in respect of scheduled international air services, granted by one State to another State or States to fly across its territory without landing (also known as a **First Freedom Right**).

Second Freedom of the Air - the right or privilege, in respect of scheduled international air services, granted by one State to another State or States to land in its territory for non-traffic purposes (also known as a **Second Freedom Right**).

Third Freedom of The Air - the right or privilege, in respect of scheduled international air services, granted by one State to another State to put down, in the territory of the first State, traffic coming from the home State of the carrier (also known as a **Third Freedom Right**).

Fourth Freedom of The Air - the right or privilege, in respect of scheduled international air services, granted by one State to another State to take on, in the territory of the first State, traffic destined for the home State of the carrier (also known as a **Fourth Freedom Right**).

Fifth Freedom of The Air - the right or privilege, in respect of scheduled international air services, granted by one State to another State to put down and to take on, in the territory of the first State, traffic coming from or destined to a third State (also known as a **Fifth Freedom Right**).

ICAO characterizes all "freedoms" beyond the Fifth as "so-called" because only the first five "freedoms" have been officially recognized as such by international treaty.

Sixth Freedom of The Air - the right or privilege, in respect of scheduled international air services, of transporting, via the home State of the carrier, traffic moving between two other States (also known as a **Sixth Freedom Right**). The so-called Sixth Freedom of the Air, unlike the first five freedoms, is not incorporated as such into any widely recognized air service agreements such as the "Five Freedoms Agreement".

Seventh Freedom of The Air - the right or privilege, in respect of scheduled international air services, granted by one State to another State, of transporting traffic between the territory of the granting State and any third State with no requirement to include on such operation any point in the territory of the recipient State, i.e. the service need not connect to or be an extension of any service to/from the home State of the carrier.

Eighth Freedom of The Air - the right or privilege, in respect of scheduled international air services, of transporting cabotage traffic between two points in the territory of the granting State on a service which originates or terminates in the home country of the foreign carrier or (in connection with the so-called Seventh Freedom of the Air) outside the territory of the granting State (also known as an **Eighth Freedom Right** or "consecutive cabotage").

Ninth Freedom of The Air - the right or privilege of transporting cabotage traffic of the granting State on a service performed entirely within the territory of the granting State (also known as a **Ninth Freedom Right** or "stand alone" cabotage).

²⁶⁷ (Manual on the Regulation of International Air Transport, ICAO Doc 9626, part 4.

Annex 2

<i>all towards Europe</i>	connectivity		
	direct	indirect	total
Germany	15,359	10,440	25,800
Spain	14,689	9,579	24,268
United Kingdom	14,165	6,607	20,772
France	11,255	6,217	17,473
Italy	10,040	6,659	16,699
Sweden	4,014	3,479	7,493
Greece	3,984	3,144	7,128
Portugal	2,738	3,113	5,851
Netherlands	3,874	1,747	5,620
Finland	2,094	3,046	5,140
Austria	2,736	2,346	5,082
Denmark	2,611	2,136	4,747
Belgium	2,283	1,653	3,937
Poland	1,886	2,020	3,906
Ireland	2,005	985	2,989
Romania	951	1,545	2,497
Czech	1,230	975	2,205
Croatia	865	899	1,764
Hungary	713	869	1,582
Bulgaria	548	814	1,362
Latvia	597	549	1,146
Estonia	283	718	1,001
Cyprus	442	529	970
Luxembourg	418	434	852
Lithuania	380	393	773
Malta	335	374	708
Slovenia	197	248	445
Slovakia	85	20	106
Total	59,342	41,435	34,590
			
	143%	94%	120%

Source: ACI Europe Airport Connectivity Report 2004-2014

Annex 3

Business connectivity measure by Member State, 2002 to 2013

Year	Bulgaria	Cyprus	Croatia	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Malta	Poland	Romania	Slovakia	Slovenia	
2002	3,109	4,412	4,049	11,952	1,444	9,523	1,857	2,103	2,888	17,134	6,594	21,366	2,365	
2003	2,872	5,104	4,127	12,417	1,662	10,188	1,947	2,364	3,153	17,975	6,463	22,918	2,659	
2004	4,001	5,598	4,942	15,434	2,191	12,036	2,963	3,239	3,285	20,962	7,207	27,041	2,994	
2005	4,849	5,766	6,297	18,782	2,641	14,548	3,882	4,017	3,395	24,609	9,372	28,163	3,862	
2006	6,162	5,562	6,816	19,796	2,809	15,465	4,073	4,258	3,360	27,962	11,837	29,630	4,332	
2007	6,644	6,562	7,892	21,495	3,359	15,387	4,301	4,380	4,101	30,776	14,570	32,714	4,802	
2008	7,493	7,341	7,394	21,787	3,264	14,569	5,446	4,976	4,001	31,819	16,221	33,232	5,313	
2009	7,166	7,320	7,438	20,265	2,538	14,313	5,649	2,440	3,900	28,786	16,247	30,346	4,778	
2010	7,268	7,630	7,754	19,904	2,641	14,343	6,291	3,221	4,049	29,341	16,375	31,822	4,270	
2011	7,339	7,878	8,427	19,748	2,893	14,388	6,743	3,167	3,956	29,274	15,992	32,044	4,264	
2012	6,782	7,903	8,575	17,949	4,152	10,819	6,917	3,218	3,913	30,766	15,617	31,335	3,544	
2013	6,376	7,199	8,740	17,531	2,889	10,005	6,961	3,730	4,271	29,056	13,892	29,715	3,257	
Year	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	Netherlands	Portugal	Sweden	United Kingdom
2002	29,390	27,399	32,788	19,265	161,204	197,301	22,024	25,741	130,230	5,452	51,676	21,191	134,314	211,609
2003	30,213	25,188	33,231	20,073	157,154	201,140	24,746	25,928	138,564	5,661	48,257	23,073	144,661	209,384
2004	33,436	25,408	35,563	21,716	160,098	216,333	27,769	26,533	141,850	5,722	50,544	28,039	156,036	218,051
2005	35,399	25,900	36,200	22,623	164,051	228,572	27,524	29,330	147,884	5,889	53,236	29,771	174,953	236,445
2006	35,880	27,287	36,043	23,890	170,570	245,544	29,625	31,747	157,334	6,229	56,149	32,573	190,184	245,704
2007	39,783	30,365	37,768	25,298	180,647	265,271	34,877	34,332	176,149	6,057	59,599	36,906	223,421	268,146
2008	40,747	31,223	38,444	26,661	175,952	258,535	34,363	34,344	174,368	5,978	58,058	35,368	209,527	260,289
2009	38,318	29,925	35,322	25,378	166,382	244,642	35,795	30,857	163,868	5,017	51,553	33,935	190,907	231,670
2010	40,194	29,235	38,778	26,238	167,360	249,956	34,976	29,310	172,311	5,047	51,665	34,840	183,664	224,979
2011	40,131	29,801	39,956	28,430	170,796	253,850	32,545	28,961	167,717	5,766	54,064	35,465	189,468	221,168
2012	39,207	29,104	38,147	25,690	172,774	248,439	28,820	28,946	160,220	6,203	55,039	35,044	173,156	223,551
2013	37,811	27,793	37,798	25,113	165,046	236,803	26,557	29,527	148,889	6,255	55,359	34,532	152,321	220,902

Leisure connectivity measure by Member State, 2002 to 2013

Year	Bulgaria	Cyprus	Croatia	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Malta	Poland	Romania	Slovakia	Slovenia	
2002	225,981.78	490,599.34	292,509.04	960,149.68	57,103.49	805,516.12	87,355.04	123,875.87	260,965.74	1,116,844.52	496,859.31	1,710,874.79	173,189.43	
2003	229,932.92	606,980.85	326,486.88	1,040,104.69	84,045.21	842,348.74	104,297.27	123,875.87	282,313.92	1,167,851.37	510,318.29	1,848,532.79	194,360.83	
2004	349,328.38	682,931.69	367,649.99	1,380,325.78	120,963.21	977,543.80	194,796.87	195,831.25	315,080.16	1,418,996.01	559,252.51	2,313,904.84	186,799.61	
2005	458,630.99	808,154.65	522,409.84	1,788,192.75	157,670.76	1,335,034.88	321,503.14	214,415.15	347,695.45	1,782,781.07	731,073.25	2,687,357.22	224,510.34	
2006	583,179.39	777,236.58	585,753.58	1,900,397.94	177,062.55	1,482,289.28	302,284.00	231,145.43	362,134.55	2,112,043.98	953,453.28	2,964,427.57	253,895.22	
2007	684,673.31	893,136.40	729,614.47	2,151,444.30	236,354.56	1,529,851.92	339,965.43	292,153.30	495,227.58	2,496,739.14	1,316,024.99	3,528,293.33	277,970.46	
2008	765,666.76	1,023,888.44	706,612.58	2,208,510.56	224,338.09	1,508,513.33	452,739.79	366,995.91	507,872.03	2,633,147.80	1,590,814.49	3,645,052.00	326,312.08	
2009	754,672.84	1,004,144.09	731,620.78	1,942,798.22	170,397.35	1,478,474.32	497,271.24	174,215.89	518,040.16	2,403,764.85	1,669,765.00	3,444,846.67	282,354.52	
2010	774,108.77	1,022,739.63	766,380.66	2,062,517.46	178,943.87	1,492,232.93	526,114.95	241,132.99	530,904.94	2,474,249.12	1,651,444.02	3,820,294.95	265,686.52	
2011	764,270.00	1,032,773.94	811,501.01	2,160,168.52	202,300.50	1,524,338.29	535,105.83	232,268.60	510,924.72	2,542,412.58	1,624,692.88	4,018,092.21	287,253.71	
2012	725,947.60	1,024,319.59	888,404.97	2,086,289.60	256,954.51	1,321,663.15	597,388.19	271,409.74	503,026.60	2,783,152.81	1,639,874.73	4,183,581.80	215,492.00	
2013	699,653.70	942,158.44	912,963.01	2,039,443.35	202,810.92	1,255,173.40	597,001.27	357,918.95	537,626.51	2,679,594.23	1,482,939.79	3,983,273.05	221,923.91	
Year	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	Netherlands	Portugal	Sweden	United Kingdom
2002	2,126,951.13	2,461,762.69	2,778,948.41	1,402,208.74	12,618,010.09	19,015,478.29	2,039,453.77	2,977,604.62	11,882,472.39	320,291.89	5,435,922.49	1,949,988.74	13,871,978.73	30,224,381.33
2003	2,271,857.34	3,231,602.71	2,913,798.96	1,503,816.49	12,859,600.16	19,548,612.34	2,324,564.45	3,090,122.11	12,673,785.71	314,148.08	5,312,069.25	2,122,069.01	15,437,723.15	29,936,992.96
2004	2,696,428.93	4,402,659.58	3,269,226.77	1,723,554.06	14,018,646.08	22,520,835.62	2,713,270.15	3,356,485.85	13,405,696.60	294,088.43	5,891,743.04	2,665,552.94	17,205,016.07	33,331,956.29
2005	3,113,075.71	2,607,137.53	3,668,929.10	1,978,795.81	15,940,204.40	25,899,420.31	2,944,463.37	4,039,029.33	15,397,568.54	344,583.68	6,730,415.91	3,061,226.62	20,899,792.05	30,815,791.10
2006	3,393,231.02	2,886,278.73	3,881,496.12	2,196,546.54	17,482,892.78	29,139,679.69	3,337,361.90	4,562,383.66	17,485,309.18	369,842.74	7,321,862.02	3,526,421.74	24,514,299.61	33,880,880.66
2007	4,052,588.15	3,410,478.91	4,145,653.84	2,625,354.23	19,597,264.16	32,843,522.03	4,107,205.90	5,224,038.85	20,731,637.11	350,479.29	8,162,983.34	4,325,291.56	28,027,620.80	35,698,915.10
2008	4,155,313.67	3,577,325.59	4,265,987.89	2,853,691.96	19,496,803.52	32,143,926.18	4,093,628.04	5,102,802.27	20,981,080.57	335,748.64	7,977,073.99	4,134,932.20	26,027,620.80	35,061,998.74
2009	3,995,053.55	3,361,176.16	4,264,828.08	2,923,037.01	19,278,175.93	33,453,515.93	4,188,080.38	4,279,027.70	22,600,017.54	297,628.04	7,590,147.42	3,995,002.55	24,555,339.17	33,958,686.12
2010	4,507,071.78	3,374,746.07	4,224,828.08	3,246,062.90	19,910,384.84	34,804,960.44	3,982,893.48	4,158,948.05	21,213,152.87	398,889.08	7,936,464.08	4,079,439.20	25,481,892.88	31,375,735.82
2011	4,755,960.21	3,511,381.05	4,437,500.59	3,065,714.74	21,331,643.56	36,256,038.75	3,526,525.17	4,262,860.37	20,522,531.21	459,165.82	8,566,576.19	4,173,609.16	24,546,677.94	31,386,493.51
2012	4,904,674.19	3,635,528.08	4,629,701.10	3,065,714.74	21,331,643.56	36,256,038.75	3,526,525.17	4,262,860.37	20,522,531.21	459,165.82	8,566,576.19	4,173,609.16	24,546,677.94	32,853,611.78
2013	4,676,157.72	3,467,338.26	4,708,520.46	3,046,318.45	20,522,772.18	34,779,721.42	3,144,335.57	4,326,619.82	18,596,015.10	467,202.13	8,568,805.92	4,302,986.17	20,595,572.30	32,983,367.94

Note: Slovakia includes Vienna
Source: Sabre ADI / Milanamos (PlanetOptim), PwC analysis in CESE study

Annex 4

Number of routes offered from a Member State towards intra-EU destinations												
Rank	Member State	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
1	United Kingdom	554	628	707	816	835	882	897	886	903	909	913
2	Spain	527	589	605	701	717	730	808	852	884	874	881
3	Germany	719	773	791	884	868	848	861	811	820	818	807
4	Italy	308	355	408	507	509	551	618	641	675	665	706
5	France	255	287	314	359	394	394	418	434	465	493	535
6	Greece	258	261	271	312	325	355	398	407	444	446	510
7	Poland	72	115	149	179	235	172	220	193	220	234	227
8	Netherlands	126	128	130	142	139	153	171	186	198	217	215
9	Ireland	115	150	167	198	212	183	185	193	187	184	198
10	Portugal	105	122	126	136	153	146	161	168	180	179	180
11	Croatia	51	62	72	77	88	110	120	109	119	139	150
12	Belgium	74	90	83	79	126	127	135	139	141	139	149
13	Sweden	76	78	87	103	131	111	126	134	128	141	144
14	Austria	135	130	141	160	163	149	148	152	149	137	137
15	Denmark	88	94	85	95	103	93	120	113	118	124	123
16	Romania	47	52	66	69	80	100	107	112	111	107	112
17	Czech Republic	60	66	74	79	89	93	90	96	103	95	97
18	Bulgaria	50	61	59	92	65	64	81	64	73	75	76
19	Malta	34	39	37	42	43	44	53	55	60	60	65
20	Finland	45	55	56	67	66	66	70	76	88	85	64
21	Hungary	41	61	68	68	63	58	54	56	67	62	62
22	Cyprus	47	49	48	53	58	60	63	63	77	67	59
23	Lithuania	23	27	38	34	32	20	38	41	52	51	54
24	Luxembourg	47	48	44	47	48	48	50	49	44	45	47
25	Latvia	18	25	24	34	39	44	47	46	43	46	46
26	Slovakia	20	23	31	29	33	32	36	29	26	24	46
27	Estonia	15	20	20	23	24	23	29	29	33	22	27
28	Slovenia	14	15	17	18	19	19	16	18	12	11	12

Source: OAG summer schedules

Number of routes offered from a Member State towards extra-EU destinations												
Rank	Member State	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
1	Germany	383	392	402	442	436	426	464	433	478	467	481
2	France	230	244	249	262	271	273	301	296	299	316	322
3	United Kingdom	226	242	260	300	278	300	319	327	306	307	318
4	Italy	167	177	203	202	219	216	255	254	247	256	247
5	Spain	108	119	137	160	166	177	190	196	212	228	229
Sum Top5												3611
6	Netherlands	110	109	112	109	108	112	120	132	128	129	129
7	Greece	40	38	52	62	68	68	84	77	81	93	103
8	Belgium	40	40	46	50	65	65	75	78	78	78	81
9	Poland	21	29	25	24	34	41	44	45	44	56	78
10	Austria	70	69	62	62	69	70	68	65	70	70	70
11	Portugal	35	38	50	48	54	50	55	62	66	65	69
12	Denmark	46	44	44	46	47	48	56	55	55	57	63
13	Sweden	24	30	31	30	38	40	38	50	42	46	61
14	Czech Republic	26	30	32	35	38	38	36	39	41	38	40
15	Croatia	10	14	19	21	26	26	36	34	39	42	38
16	Cyprus	25	25	28	29	31	36	33	35	46	38	35
17	Finland	19	16	23	23	23	25	22	30	28	32	32
18	Ireland	17	16	20	24	26	23	18	21	23	26	31
19	Bulgaria	19	16	18	19	20	19	27	24	30	30	31
20	Hungary	24	24	26	26	27	25	24	24	10	13	21
21	Slovakia	6	6	5	4	4	4	2	2	3	6	18
22	Latvia	5	9	16	21	26	27	31	27	21	23	17
23	Romania	28	32	32	12	18	20	20	19	16	18	16
24	Lithuania	6	8	9	6	10	6	6	6	11	16	14
25	Malta	12	10	11	10	10	8	9	10	12	14	11
26	Slovenia	12	11	12	12	14	12	13	12	10	10	10
27	Luxembourg	5	4	4	9	10	9	9	8	9	11	9
28	Estonia	3	4	4	4	5	5	6	4	7	6	6
Sum rest												983

Source: OAG summer schedules

Annex 5 Airport charges comparison – EU and rest of world

Airport Charges (in GBP) at Selected Airports Boeing 737-800 Aircraft

Airport	Aircraft Charges 2012	Aircraft Charges 2013	% Chg Airport Charges	Pax Charges 2012	Pax Charges 2013	% Chg Pax Charges	Total Charges 2012	Total Charges 2013	% Chg Total Charges
EUROPE									
Frankfurt	740	1048	42	2,758	2,390	-13	3,498	3,437	-2
London LHR	1,459	2,747	88	3,757	4,381	17	5,216	7,127	37
Paris CDG	586	863	47	3,587	2,258	-37	4,173	3,121	-25
Madrid	860	1,190	38	2,214	2,473	12	3,074	3,663	19
Amsterdam	983	573	-42	2,591	2,628	1	3,574	3,201	-10
Istanbul IST	662	776	17	1,085	1,043	-4	1,747	1,819	4
Moscow DME	887	1,336	51	1571	1,168	-26	2458	2,505	2
AFRICA									
Johannesburg	936	725	-23	1,896	1,961	3	2,833	2,686	-5
Casablanca	580	865	49	1,540	2,023	31	2,120	2,888	36
Nairobi	442	238	-46	3,485	2,782	-20	3,927	3,020	-23
ASIA PACIFIC									
Dubai	272	279	3	1,517	1,515	0	1,790	1,794	0
Hong Kong	533	534	0	497	502	1	1,030	1,036	1
Beijing	377	550	46	926	791	-15	1,302	1,341	3
Tokyo NRT	1,639	1,522	-7	1,804	1,812	0	3,442	3,333	-3
Sydney	355	507	43	3,214	3,441	7	3,569	3,949	11
AMERICAS									
Chicago ORD	780	869	11	2,541	2,282	-10	3,321	3,151	-5
New York JFK	677	1,033	53	313	348	11	991	1,381	39
Rio de Janeiro GIG	571	382	-33	2,071	2,161	4	2,643	2,543	-4

Source: rdc Aviation/airportcharges.com (Parameters: Currency – GBP; Aircraft – Turkish Airlines B737-800; international route; turnaround time – 60 mins; MTOW – 79.0 tonnes; MLW – 65.3 tonnes; capacity – 155 passengers; load factor – 70%; passengers – 109)

Airport Charges (in GBP) at Selected Airports for Boeing 747-400 Aircraft

Airport	Aircraft Charges 2012	Aircraft Charges 2013	% Chg Airport Charges	Pax Charges 2012	Pax Charges 2013	% Chg Pax Charges	Total Charges 2012	Total Charges 2013	% Chg Total Charges
EUROPE									
Frankfurt	4,064	5,998	48	6,283	5,306	-16	10,347	11,304	9
London LHR	2,078	3,911	88	8,558	9,726	14	10,636	13,637	28
Paris CDG	2,959	3,772	27	8,170	5,013	-39	11,129	8,786	-21
Madrid	3,844	4,458	16	5,043	5,490	9	8,887	9,948	12
Amsterdam	5,668	5,523	-3	5,902	5,835	-1	11,570	11,358	-2
Istanbul IST	2,584	3,061	18	2,472	2,316	-6	5,056	5,377	6
Moscow DME	4,402	5,431	23	3,579	2,594	-28	7,981	8,024	1
AFRICA									
Johannesburg	3,973	3,557	-10	4,320	4,354	1	8,293	7,911	-5
Casablanca	4,615	5,234	13	3,508	4,491	28	8,123	9,726	20
Nairobi	1,194	1,244	4	7,938	6,176	-22	9,132	7,420	-19
ASIA PACIFIC									
Dubai	1,080	1,099	2	3,456	3,363	-3	4,536	4,463	-2
Hong Kong	2,174	2,188	1	1,132	1,115	-1	3,306	3,303	0
Beijing	2,074	2,397	16	2,108	1,755	-17	4,182	4,152	-1
Tokyo NRT	5,701	5,645	-1	4,108	4,022	-2	9,809	9,667	-1
Sydney	1,762	2,199	25	7,321	7,640	4	9,083	9,839	8
AMERICAS									
Chicago ORD	3,872	3,132	-19	5,788	5,066	-12	9,660	8,198	-15
New York JFK	3,361	4,547	35	713	772	8	4,075	5,319	31
Rio de Janeiro GIG	2,113	1,897	-10	4,718	4,797	2	6,831	6,694	-2