
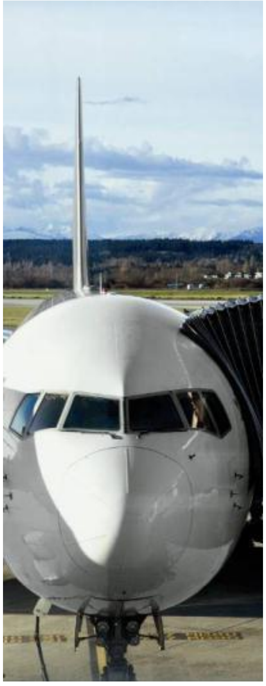


Annual Analyses of the EU Air Transport Market 2012

Final Report

December 2013
European Commission

Mott MacDonald

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Mott MacDonald, Mott MacDonald House, 8-10 Sydenham Road, Croydon CR0 2EE, United Kingdom
t +44 (0)20 8774 2000 f +44 (0)20 8681 5706, W www.mottmac.com

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Mott MacDonald, Mott MacDonald House, 8-10 Sydenham Road, Croydon CR0 2EE, United Kingdom
t +44 (0)20 8774 2000 f +44 (0)20 8681 5706,   W www.mottmac.com

Content

Introduction

Purpose of the Report

Mott MacDonald has been commissioned by the Directorate General for Mobility and Transport (DG MOVE) to provide an annual analysis of the EU Air Transport Industry in 2012. The European Commission has provided such annual reports since 1998; and the Mott MacDonald contract covers the three years of 2010, 2011 and 2012. In undertaking this work, we have been specifically requested to focus on a factual analysis of how and why European air transport has evolved in relation to other global regions, seeking the factors behind changes in trends and policies as well as their consequences.

Although this report is publicly available, the primary audience is DG MOVE. In this respect, the report is not intended to be just a statistical compendium or an activity report of aviation events that have happened in 2012. This knowledge is already known to the Commission. Instead, we have tried to provide 'value-added' to DG MOVE by drawing out the economic, regulatory and policy implications of aviation developments in 2012 in relation to the European air transport industry and its competitiveness in a global context.

In compiling this very broad-based report, we have necessarily drawn on the wealth of publicly available analysis from other organisations and industry commentators as well as our own. We acknowledge this, and have provided the source of all data and information used.

About Mott MacDonald

Mott MacDonald is a £1 billion turnover global consultancy of unrivalled diversity spanning 140 countries. Our breadth of skills, sectors, services and global reach makes us one of the world's top players in delivering management, engineering and development solutions for public and private sector customers.

We have over 15,000 staff working in all sectors from transport, energy, buildings, water and the environment to health and education, industry and communications. We provide a comprehensive range of planning, design, project delivery and business advisory services covering all stages of a project from concept to completion.

The Aviation team, based in Croydon, UK, comprises 50 staff and has a strong track record in providing independent technical support and advice to a wide variety of clients covering economics, forecasting, regulation, market analysis, aviation strategy, financial due diligence, airport construction and operations monitoring, airport planning and design and airline operations. We have provided consultancy support in over 120 countries around the world.

Structure of the Report

The report is structured in ten chapters covering all aspects of the air transport industry, together with an executive summary and a glossary. The following table provides the main components for each chapter.

Scope of the Report

Sections 6-10 were produced in April 2013, with Sections 1-5 completed in October 2013 when key data and statistics were available. The report concerns aviation developments in the calendar year 2012. Where data covering 2012 was not available, the most current information has been provided. Recent events in 2013 that might impact the air transport sector are outside of this scope.

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Executive Summary

2012 Headlines at a Glance

	World	Europe	Units	Source
Passengers	2.9 billion (+5.5%)	**0.8 billion (+0.7%)**	Passengers carried	ICAO for World Eurostat for Europe (EU27)
Airline Demand (RPK)	+5.3%	**+5.1%**	Revenue Passenger Kilometres	IATA
Airline Capacity (ASK)	+3.9%	**+2.9%**	Available Seat Kilometres	IATA
Commercial Air Transport Movements	55.5 million (+0.8%)	**16.0 million (-1.5%)**	Airport Movements	ACI
Cargo (FTK)	-1.5%	**-2.9%**	Freight Tonne Kilometres	IATA
GDP	+3.2%	**-0.3%**	GDP growth (Europe = EU27)	IMF
Airline Profitability	$7.4 billion	**$0.4 billion**	Net Profits	IATA
Busiest Airport (Passengers)	Atlanta, U.S. (95.5 million)	**Heathrow, UK (70.0 million)**	Passengers	ACI
Commercial Jet Aircraft Fleet	23,611	**6,808**	Western and Russian-built Civil Airliner Jets	Flightglobal
Safety	21 accidents 426 fatalities	**0 accident 0 fatalities**	Commercial Airline (>5,700kg) Fatal Accidents & Fatalities	EASA

Foreword

2012 saw the global aviation industry continue its recovery as the worldwide economy shook off the worst of the impacts of the recent economic meltdown and fostered a more conducive environment within which air travel demand could grow. As a record 2.9 billion passengers took to the skies across the globe, airlines were rewarded for seat capacity control as demand outstripped supply and pushed up average loads.

Although airline net profits were slightly down compared to the previous year, it does show, at the very least, a level of stability that has been absent in recent years. But with average jet fuel spot prices rising 1.5% in 2012 versus 2011, the emphasis has once again been on reducing operating costs to balance the books.

As is becoming the norm, the global uptick in air travel demand was characterised in 2012 by regional variations in performance. In terms of traffic growth, it was the emerging markets in Asia Pacific, Latin America and the Middle East that continued to record the strongest increases, while the mature economies of the West experienced dampened yet solid demand, in line with the prevailing economic climate – which also had a negative impact on global air cargo volumes.

China, India and Indonesia in particular were the markets driving Asia Pacific into the dominant air transport region in 2012, ahead of Europe and North America in terms of air passenger traffic volumes. The latter two regions were being hindered by residual impacts of the ongoing but easing Eurozone economic crises, and low business and consumer confidence in the U.S.

There was also a regional disparity in airline financial results. The majority of the US$7.4 billion net profit reported by IATA member airlines was attributable to those members registered in the Asia Pacific and Middle East regions, while European carriers collectively posted a mere US$0.4 billion of that total. Within the total, however, there were major gains posted by Lufthansa, Ryanair and easyJet, but the European average was dragged down by the likes of Air France KLM and IAG Groups reporting major losses. The European air transport industry is still rationalising, with several established airlines folding in 2012 – notably Malev, Spanair and Cimber Sterling.

Socio-political events in North Africa and across the Middle East continued to impact the regions' air travel demand, although the major Middle Eastern airlines of Emirates, Qatar and Etihad showed no signs of abating their global ambitions.

The industry's green credentials are always the subject of much debate, but efforts continued in 2012 to develop better and more efficient ways of reducing the aviation's impact on climate change. 2012 was also the year when the aviation sector became officially included in the EU ETS. However, in November 2012 the EC 'stopped the clock' on the implementation of the international aspects of its ETS aviation by deferring the obligation to surrender emissions allowances from air traffic to and from the EU by one year.

Air travel keeps getting safer. At 21, the global number of commercial airline fatal accidents in 2012 is the lowest in recent history and represents a major achievement. The number of fatalities from these accidents in 2012 also represents a record low. European passengers travelling on the region's main scheduled carriers enjoyed an overall improvement in on-time arrival performance, even as the continent's major airports suffer congestion.

The salient points of the 2012 industry review are highlighted in the executive summary that follows.

Traffic

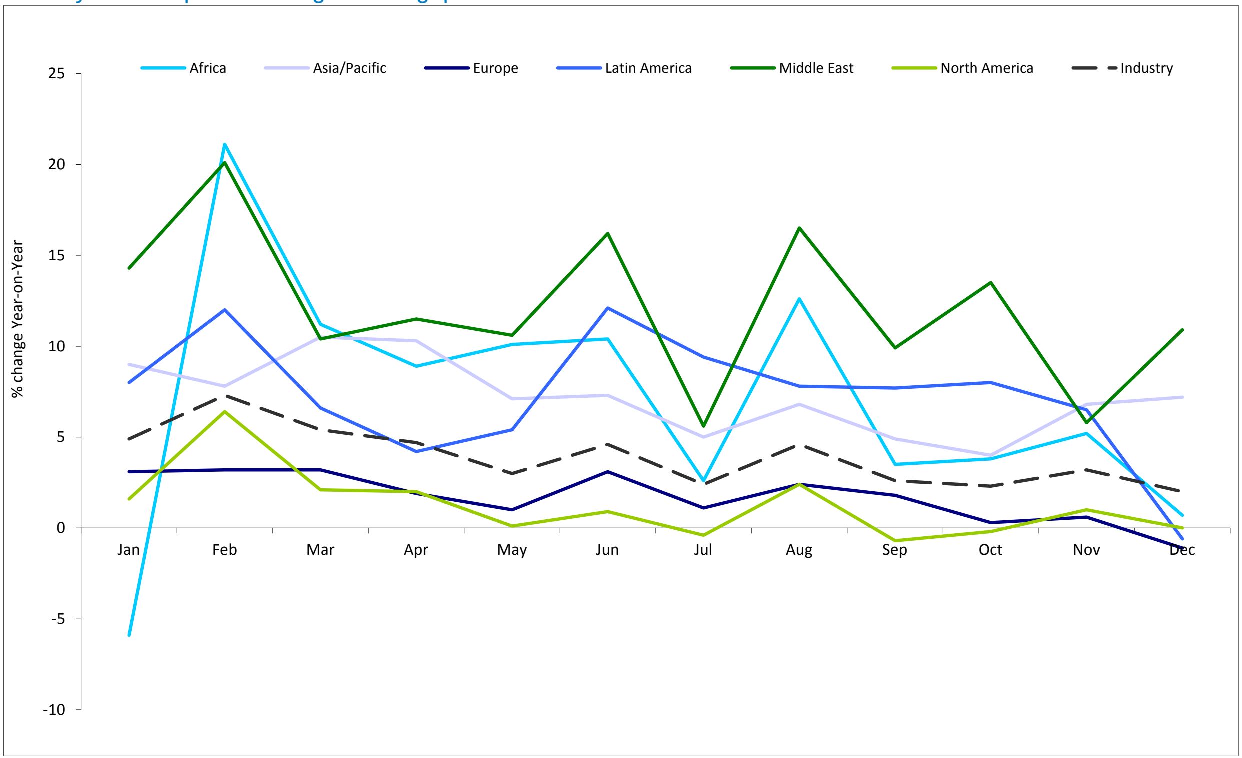
2012 was largely a positive year for air travel demand across the world regions.

The International Civil Aviation Organisation (ICAO) stated airlines of its 190 member states handled 2.9 billion passengers in 2012, a 5.5% year-on-year increase on 2011.

Air travel demand in 2012 was relatively uninterrupted by any major global events. Although there existed variations in the monthly growth rates versus the previous year, these were mainly attributable to the distorting effects of several major regional events during the course of that year, namely the North African / Middle East political uprisings and the Japanese earthquake. In North America, lower than expected business and consumer confidence hit air travel demand, while in Europe the impact of the economic downturn continued to be supressing growth in air traffic throughout the year.

When considering general trends in air travel demand, 2012 continues the pattern seen in previous years of European and North American growth lagging that of the Middle East, Asia Pacific and Latin America.

Monthly 2012 Airport Passenger Throughput Growth Rates



Source: ACI Monthly Worldwide Airport Traffic Reports, January-December 2012

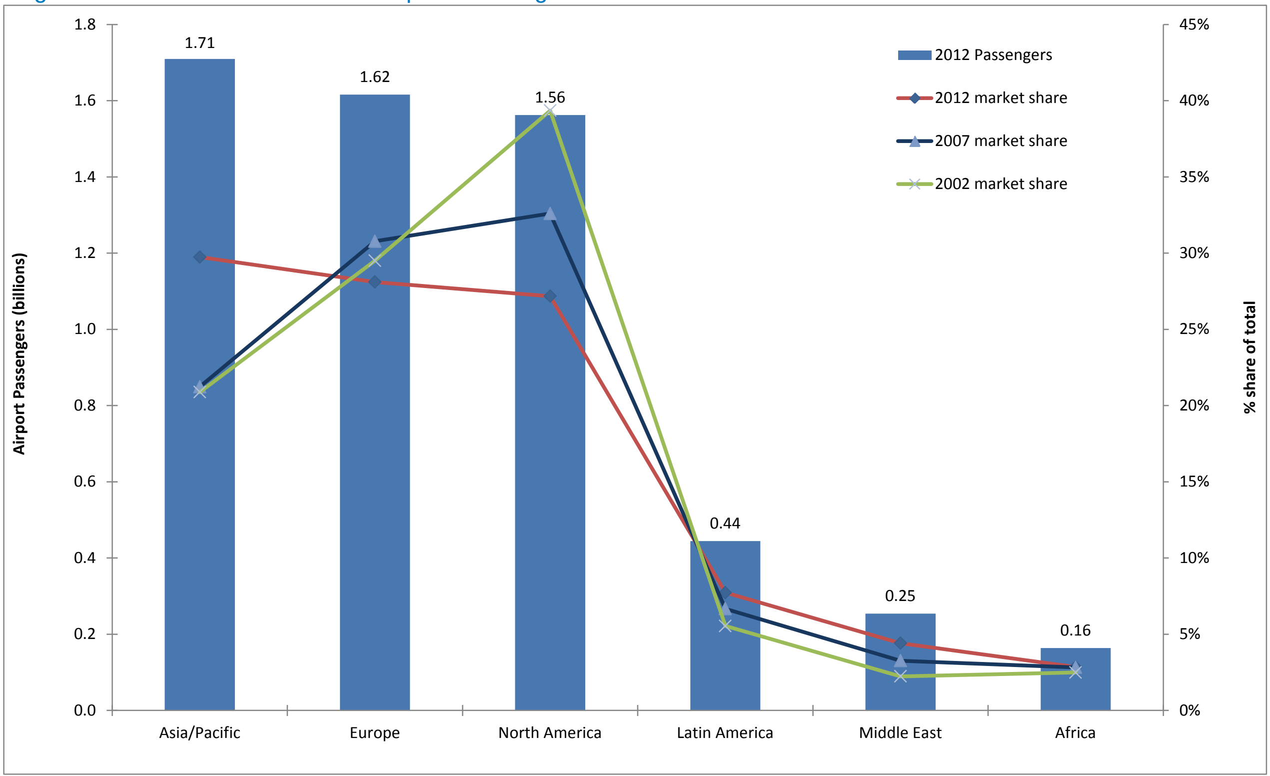
International traffic (6.5%) grew at a faster pace in 2012 than domestic (3.9%). The largest international market in terms of share is Europe (39% of total International RPKs), followed by Asia Pacific (with 27% share). In 2012, these two regions achieved similar growth in international air traffic, but diverged significantly on the performance of their domestic markets. Growth in domestic airline RPKs in Europe was actually negative, albeit the size of the market is relatively small (8% share) compared to others. However, domestic traffic within Asia Pacific accounts for 35% of the global total (second only to North America), and this segment grew at an impressive 8.8%. Within this segment, the fast-growing domestic markets of China, India and Indonesia all contribute to this overall expansion.

By analysing global airport passenger traffic data from ACI, we can observe that at the beginning of the previous decade, North America's airports commanded the greatest market share of passengers, reflecting both the pre-eminence of its domestic market and also the extent and development of its international network. The European market was a clear second, some distance behind North America but also significantly ahead of Asia Pacific, which, at this stage, was a relatively immature market yet to unlock its full potential.

Fast forward ten years to 2012 and the landscape has changed as Asia Pacific, dominated by vast, rapidly growing domestic markets in China, India and Indonesia, has transformed the region on the global stage. 2012, for the first time, saw Asia Pacific assume status as the leading global air transport market.

The Figure below serves to underline the shift in the focus of growth. As recently as 2002, North American airports dominated with a market share of global passenger throughput around 40%. Since then, European and to a greater extent Asia Pacific airports have eroded that dominance and gained market share to achieve parity, and eventually overtake by 2012.

Regional Distribution of Worldwide Airport Passenger Traffic and Historic Market Shares



Source: ACI Worldwide Airport Traffic Report

Compared to the North American and Asia Pacific market shares of global air passenger traffic, Europe's has remained fairly constant in the last decade, hovering around 30% since 2002 (falling to 28% in 2012).

During this period (2002-2012), European airports have increased passenger throughput at an average annual rate of 4.9%. When the peaks and troughs are ironed out, underlying growth of over 4% per year represents a solid achievement for a mature air transport market, indicating the success of and further potential for growth into emerging markets.

However, Europe's growth must be put into context alongside the meteoric growth recorded by Asia Pacific airports over the same time period. This regions' market share of total global airport passenger throughput increased from 21% in 2002 to 30% in 2012, on the back of 9.2% average annual growth (nearly double that achieved by Europe's airports).

The market share gain made by Asia Pacific has been mainly at the expense of North America, and recently to a lesser extent, Europe. The saturated North American market has experienced sluggish growth between 2002 and 2012, growing at an average annual rate of 1.6%. Its market share reduced from 39% to 27% during this period.

This new power shift is set to continue with the Asia Pacific airports increasing in size and global importance, driven by the economic growth in China and India, as well as an increasing awareness by ASEAN of the importance of liberalisation in its air transport market.

Airport Financial Results

According to the ACI Economics Survey 2012, based on a response from 696 airports that collectively handled 3.76 billion passengers in 2011, or some 70% of global traffic in that year, worldwide total airport income in FY 2011/12 reached USD 108.2 billion, an increase of 2.4% on FY 2010/11.

The global airport industry enjoyed aeronautical revenues of USD 60.9 billion in FY 2011/12, an increase of 11%, achieving an overall net profit of €3.3 billion. According to ACI, only the larger and medium sized airports are generally able to generate reasonable profits. Those European airports handling fewer than 5 million passengers per annum tend to make very small returns compared to the capital invested. 42.5% of European airports were loss-making in 2012.

In Europe, total airport revenues reached €33.2 billion in FY 2011/12. This is an increase of 9% over the previous year, and it is commensurate with traffic growth of 2010/11 (+7.3%). Excluding other revenues and ground-handling revenues, aeronautical revenues accounted for 59% of total airport revenues in 2011, with non-aeronautical revenues representing 41%.

Aeronautical revenues reached €16.2 billion in FY 2011/12 (+9%). These are mainly composed of airline-related charges (levied on a per aircraft basis), and passenger related charges (levied on a per passenger basis). The ratio of airline-related to passenger-related charges has shifted since 2008 significantly towards passenger-related charges and today 67% of aeronautical revenues are generated by the passenger.

In FY 2011/12, non-aeronautical revenues at European airports amounted to €11.2 billion. The single largest non-aeronautical revenue stream is the airport retail concession, accounting for 43% of non-aeronautical revenues. It is followed by property and rent (27%) and car parking (19%). Except for rental car concessions, revenues increased in all categories in absolute numbers.

Airlines

2012 saw continued growth in the World Air Transport market. IATA recorded growth of 5.3% of Revenue Passenger Kilometres (RPK) compared to 2011.

With an industry average of 79.1%, passenger load factors were 1% higher than in 2011, a result of the growth in RPKs remaining above growth in Available Seat Kilometres (ASKs) as airlines kept tighter control over the available capacity in the markets. Load factors for 2012 were above the corresponding months of 2011 for all but July where no change was recorded. As expected, PLF's were not uniform throughout the year, with the Northern Hemisphere Summer witnessing the highest load factors.

As is becoming a trend, the cost of jet fuel remained a key concern for airlines in protecting profitability in 2012. Jet fuel prices were volatile during the year with a marked drop during Spring, before prices recovered in August to the level seen at the start of the year.

Air Fares were at a lower level in 2012 compared to 2011, partially as a result of the slightly reduced fuel costs in the early part of the year.

In 2012, industry-wide net profits of some US$ 7.4 billion are marginally lower than those recorded in 2011, but this still represents a reasonable outcome when compared against recent historical results. The core reason for the dip in net profits in 2012 is that again, the rise in expenses (7.0% year-on-year) outstripped that of revenues (6.9%), with high fuel costs the main contributory factor accounting for 32% of total costs in 2012 although Non-fuel expenses also continued to rise.

Of the European airline failures in 2012, Malev and Spanair are among the most significant. When Malev was declared insolvent in February of 2012, the impact was felt at the airline's base, Budapest, as passenger traffic declined 13% in February versus 2011. The collapse in January 2012 of Spanair, whose base was at Barcelona (BCN), would have impacted traffic levels more severely at that airport had other carriers not offset the decline by increasing capacity. Cimber Sterling and Wind Jet, the Danish and Italian carriers that also ceased operations in 2012, had similar impacts on passenger traffic levels at their base airports.

Global Air Cargo Growth

According to IATA, its member airlines collectively recorded a decline in air cargo traffic – measured in Freight Tonne Kilometres (FTKs) – of 1.5% in 2012 over 2011 levels, further compounding the decline of 0.6% the previous year. IATA cites a sharp slowdown in world trade growth and shifts in commodity mix favouring sea transport as being responsible for placing further downward pressure on air cargo demand.

Airlines in all regions were affected, with the exception of African and Middle Eastern carriers who witnessed FTK growth of 7.1% and 14.7% respectively, supported by new trade links between Africa and Asia.

The worst affected region was Asia Pacific, with airlines seeing a 5.5% contraction in air cargo traffic in 2012. In terms of global trade, Asia Pacific is a major manufacturing centre and source of outbound cargo to keys markets in Europe and North America. Demand for manufactured commodities in these two regions was weak throughout 2012, giving airlines of Asia Pacific, Europe and North America fewer goods to transport.

The beginning of 2012 saw a reduction in International freight in most markets, although the decline on the North Atlantic was not as pronounced as in other regions. A recovery was evident just after the dip in January 2012 but aside from a small positive variance in the North and Mid Pacific markets between July and September 2012 all markets remained challenging.

IATA noted that growth was experienced by airlines in Africa and the Middle East, but routes between North America and Central America remained in decline throughout much of the year. There was a notable recovery in the latter months of 2012 with significant growth experienced in the North America – South America, within South America and Africa – Middle East. All three are rapidly developing marketplaces with expanding based airlines.

In its air cargo market analysis for 2012, IATA suggests that the business environment for air cargo declined in 2012 again because of flat trade indicators and confidence. The deepening Eurozone crisis also further reduced demand against a backdrop of general weakness of the economies of developed countries.

Forecasts

A short term passenger traffic forecast for the period 2013 to 2015 was produced by ICAO in 2013, using 2012 preliminary figures as a base. ICAO expects global growth in 2013, 2014 and 2015 of 4.8%, 5.9% and 6.3% respectively. In the previous forecast for 2013 and 2014 the projected growth was of 6.0% and 6.4%, so ICAO has revised downwards its expectations of air passenger growth.

The Middle East is projected to be the fastest growing region, attributable to its carriers' performance with ever-increasing market share gains. The Middle East is followed by Latin America, Asia Pacific and Africa. Europe is projected to grow faster than North America, albeit this growth will be slower than in the emerging markets.

ICAO – RPK Annual Growth Rates Forecast

Region of Airline Registration	History		Forecast		
	2011 (%)	2012* (%)	2013 (%)	2014 (%)	2015(%)
Europe	9.5	3.9	4.4	5.5	6.2
Africa	0.9	4.2	5.2	5.7	6.0
Middle East	9.2	13.7	10.2	11.2	10.8
Asia Pacific	6.8	6.4	5.5	6.4	6.8
North America	2.4	1.3	2.3	3.3	3.8
Latin America/Caribbean	11.1	8.6	7.6	8.7	8.0
World	**6.5**	**4.5**	**4.8**	**5.9**	**6.3**

Source: ICAO Medium Term Forecast 2012 *Preliminary figures

Boeing and Airbus have both produced a broad long term global market forecast for the period 2013 to 2032 using 2012 as the base year.

Boeing & Airbus Forecast Comparison

	Boeing	Airbus
RPK (trillion) 2012	5.5	5.5
RPK (trillion) 2032	14.6	13.9
Total Growth 2012 – 2032	164%	151%
Average Annual Growth Rate	**5.0%**	**4.7%**

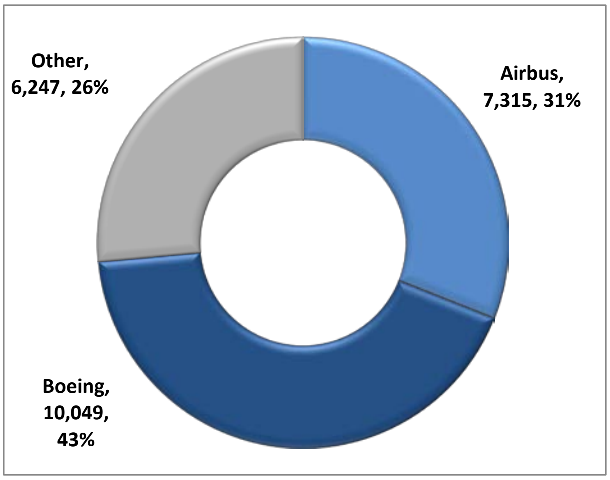
Source: Boeing, Airbus

Eurocontrol's medium term base case for flight movement growth in Europe is forecast to be 11.2 million in 2019. This figure is 17% more than in 2012. The weakness of the economic situation in Europe and the financial difficulties of carriers are reflected as in the first year of the forecast a decline of 1.3% is predicted (whereas the low case scenario would see a decline of 2.9% in 2013). For the years between 2014 and 2019 growth is expected to recover to 2.9% per year. However, the 2008 peak of 10.1 million flights is now expected to be overtaken only in 2016. In its previous forecast (September 2012) EUROCONTROL expected that this threshold would be achieved in 2015; therefore it is indicating a slower rebound of traffic in the region, with an annualised growth rate of 2.3% expected between 2013 and 2019.

Aircraft Fleets

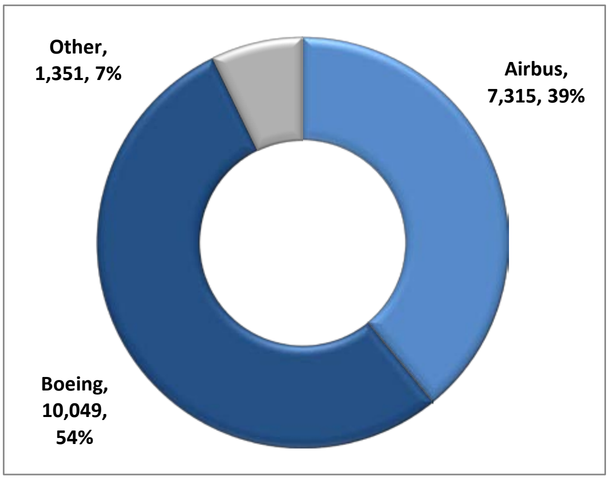
As of December 2012, Boeing and Airbus aircraft make up nearly three quarters of the global fleet market share for civil airliner jets (which comprise regional, narrowbody and widebody aircraft, excluding turboprops), with Boeing accounting for a greater share of the total (43%) compared to Airbus (31%), which was the same the previous year. The remaining 26% is dominated by Embraer and Bombardier as active manufacturers in the regional jet sector.

Share of Global Civil Airliner Jet Fleet 2012



Source: Flightglobal ACAS

Share of Global NB & WB Jet Fleet 2012

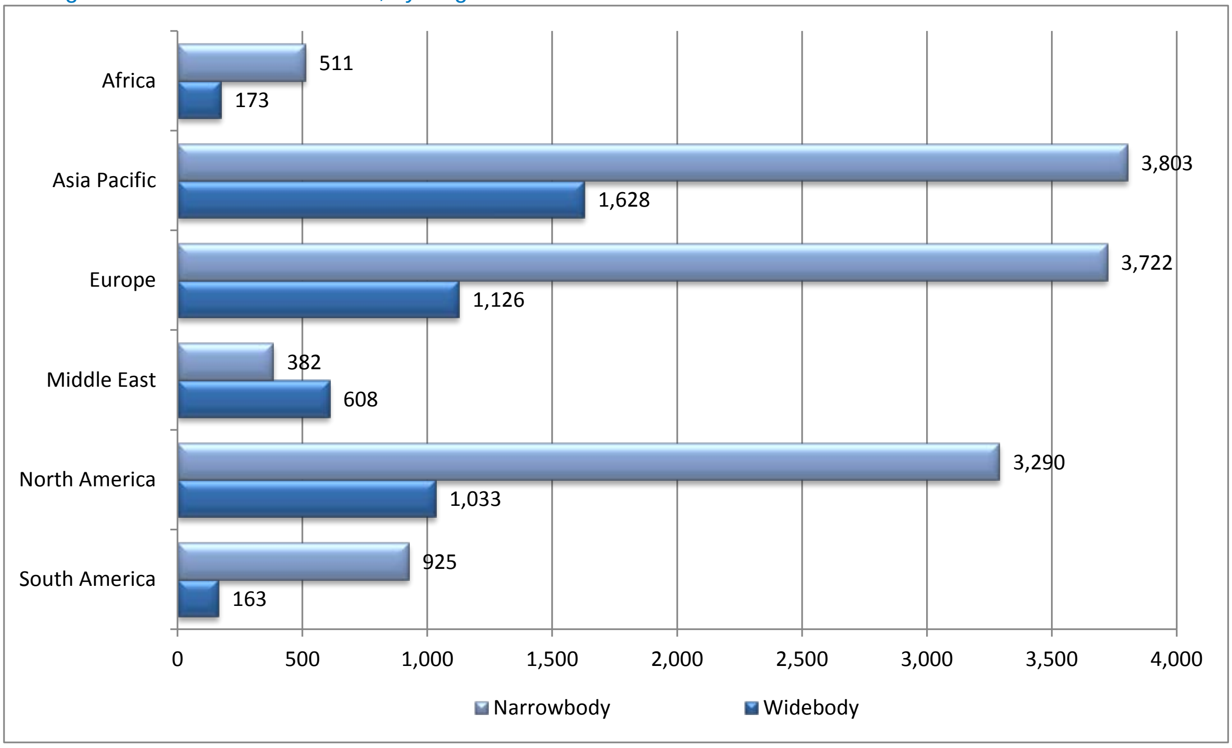


Source: Flightglobal ACAS

The Figure below shows the consolidated Boeing and Airbus aircraft fleets by narrowbody and widebody categorisation, by world region. The continued rise of low cost carriers (LCCs) and growth of hub and spoke networks has supported the continued popularity of narrowbody aircraft. Narrowbody aircraft have dominated Boeing and Airbus order books in recent years.

Boeing reports that, in Europe, single aisle aircraft will account for 70% of new deliveries through to 2032. By comparison the greatest concentration of the widebody (twin aisle) fleet can be found in Asia Pacific, where the long distances involved in some city pairs suit medium- to long-haul, high capacity models. Nevertheless, the burgeoning LCC (Low-Cost Carrier) growth in the Asia Pacific region is contributing to 69% of new aircraft deliveries by 2032 being narrowbody aircraft.

Boeing and Airbus civil aircraft fleet, by Region in 2012



Source: Flightglobal ACAS

Air Traffic Management

Now that the initial Reporting Period 1 (RP1) of the SES II Performance Scheme has started, focus has moved onto the assessment of current performance and on the proposed regulatory and performance target setting approach for the next reporting period, RP2, which runs for five years from 2015 to 2020.

Although revised performance plans collectively still fell short of EU-wide targets for RP1 by a small margin, the Performance Review Body (PRB) concluded that States had made a major collective effort to close the gap in terms of capacity and cost-efficiency and that this would result in savings of some €2.4 billion over RP1 compared to the 2009 unit rate baseline. The PRB also concluded that the Network Management function was making an adequate contribution to the EU-wide targets. However, in terms of the development of Functional Airspace Blocks (FABs), only two out of nine had been fully established in advance of the December 2012 deadline.

In November 2012, the European Commission said that there was little evidence of FABs contributing towards an integrated and defragmented airspace and warned that Europe was still a long way from creating a single airspace. In 2013, the Commission will present proposals to make sure the nine FABs deliver real operational improvements.

In 2012, a 2nd edition of the European ATM Master Plan was issued and further developments were made in determining the set up sequence for the SESAR Deployment Phase due to start in 2015. Guidance material has been issued on how common projects should be set up, governed and implemented.

2012 saw many ATM technical developments including the world's first four dimensional optimised flight and several pioneering operational projects providing safety improvements to airport approach control and landing. There was also significant progress towards the development of a Roadmap to achieve the safe integration of Remote Piloted Aircraft Systems (RPAS) into civil airspace.

EU External Aviation Policy

In 2012, the European Commission launched a review of the EU's external aviation policy and presented a Communication COM(2012)556, entitled "The EU's External Aviation Policy – Addressing Future Challenges". The review scrutinised the Road Map's objectives and provided an update of progress made since its development.

The Road Map was based on three defining pillars:

1. Bringing existing bilateral air services agreements between EU Member States and third countries in line with EU law;
2. The creation of a true Common Aviation Area with the neighbouring countries;
3. The conclusion of aviation agreements with key strategic partners.

In line with these three pillars, the Commission has been working to enhance aviation relations with neighbouring countries and other key international partners. On 30 July 2012, the EU and Israel initialled a comprehensive aviation agreement, following eight rounds of negotiations since December 2008, culminating in a final round of negotiations in March 2012. A potential consequence of increased liberalisation in the EU-Israel market is growth in the low cost sector. In March 2012, LCC penetration on international routes to/from Israel[1] was a mere 7.3% of seat capacity, led by air berlin and easyJet. It has been suggested that LCCs may, however, be reluctant to increase operations into Israel due to the prohibitively high costs involved with the significant security procedures at Tel Aviv Ben Gurion airport.

In June 2012, the Republic of Moldova and the EU signed a comprehensive air services agreement that will open up and integrate the respective markets, strengthen cooperation and offer new opportunities for consumers and airlines. With the establishment of the agreement, all EU and Moldovan carriers will be able to operate direct flights between the EU and Moldova.

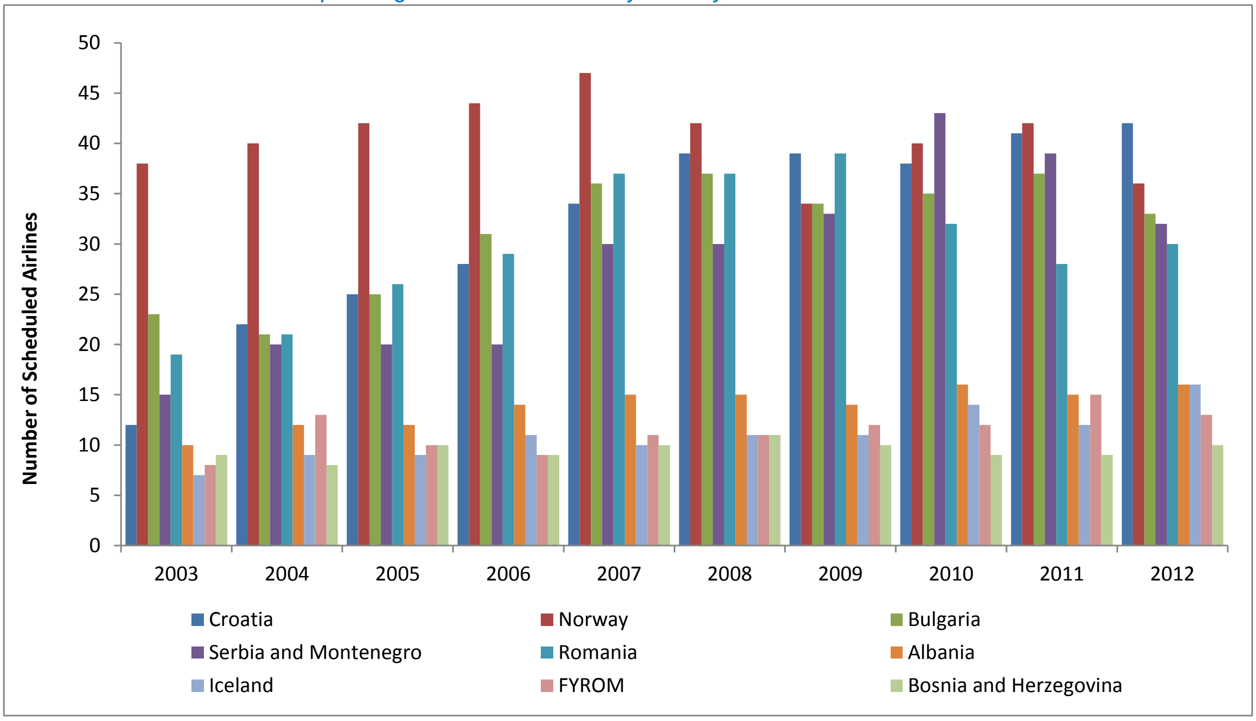
Russia's aviation relationship with the EU exists in the form of individual Air Service Agreements with EU Member States. The vision is to develop a comprehensive EU-Russia agreement that will enhance

[1] CAPA; Israeli market set to open up under new open skies agreement with EU; 26/03/12
http://www.centreforaviation.com/analysis/israeli-market-set-to-open-up-under-new-open-skies-agreement-with-eu-70449

cooperation and create material benefits for both parties. Irrespective of this, the Commission requested EU Member States to bring their bilateral agreements with Russia into line with EU law. Despite some progress, the main issues (acceptance of an EU designation clause and deletion of references to mandatory commercial agreements between designated air carriers) still remain to be resolved.

In terms of the expanded single aviation market creating increased competition in the post-2006 ECAA markets, the number of airlines operating intra-ECAA air services has been examined for the period 2003-2012 to observe the situation before and after ECAA expansion.

Number of scheduled airlines operating intra-ECAA routes by country



Source: OAG

It is quite noticeable from the Figure above that the ECAA markets examined have collectively witnessed a 'flattening' in levels of competition on intra-ECAA routes, with some exceptions.

Some of this may be attributable to the general economic climate post-2008 impacting negatively on air travel demand, and some of the stagnation in competition levels may be due to consolidation and airline bankruptcies.

However, at a high level, it is important to note that the level of competition in the ECAA markets, overall, has grown significantly between 2003 and 2012, which must in some part be attributable to joining the Common Aviation Area as market-opening will have stimulated demand and encouraged more carriers to enter those markets.

Competition Issues

In terms of investigation of alleged State aid and enforcement of State aid rules with regard to airports and airlines, the following developments took place in 2012:

1. During 2012, the Commission adopted 37 decisions concerning the financing of airports and their interaction with airlines, passenger tax schemes, or the restructuring of airlines. About two thirds of these decisions related to regional or sectoral developments concerning airports and the other third were related to individual airlines or groups of airlines. 16 Member States were implicated in the decisions, with half the cases relating to either France or Germany.

2. Of the 37 decisions, 14 related to existing cases and 23 to new cases. For the existing cases, 6 concluded that the financing did not constitute State Aid, 3 resulted in a decision to extend proceedings while the remainder related to corrigenda to the wording of previous decisions. For the new cases, 10 resulted in a decision not to raise objections while 13 resulted in a decision to initiate a formal investigation procedure. These decisions relate to over 60 on-going state aid investigations in the aviation sector.

In terms of airline acquisitions and mergers, in March 2012 the Commission cleared under the EU Merger Regulation the acquisition of UK airline bmi by IAG, the holding company of British Airways and Iberia. In July 2012, the Commission opened an in-depth investigation into the proposed acquisition of TNT Express by UPS, both major players in the express package delivery sector. Due to competition concerns, the decision to prohibit the merger followed in January 2013. In August 2012, the ongoing proposed acquisition of Aer Lingus by Ryanair was considered and assessed in detail by the Commission, and rejected in February 2013 due to concerns over the creation of a dominant competitive position in the Irish market.

EU Emissions Trading Scheme

On 1st January 2012, the aviation sector became officially included in the EU ETS. The system covers all the CO^2 emissions from flights departing from or arriving at EU airports (and extended to include EEA states). Aircraft operators will be required to monitor and report their emissions on an annual basis, and then surrender the equivalent number of allowances to their annual emissions. The scheme is designed to allow the aviation industry to grow sustainably whilst at the same time ensuring it pays commensurately for its emissions.

The emissions cap for aviation in the EU ETS for 2012 was set at 97% of the average emissions between 2004 and 2006, falling to 95% of the historic baseline from 2013 to 2020. In this cap, 85% of the allowances will be allocated for free, including 3% of allowances in a special reserve for new or rapidly growing aircraft operators.

However, on 12 November 2012 the European Commission issued a press statement declaring that, in agreement with the 27 EU Member States, it is ‘stopping the clock’ on the implementation of the international aspects of its ETS aviation by deferring the obligation to surrender emissions allowances from air traffic to and from the EU by one year.

However, the obligations relating to all operators’ activities within the EU (i.e. on intra-EU services) are to remain intact and this will be enforced in line with EU law.

The Commission made the decision following news from the ICAO Council that progress had been made in reaching agreement on establishing a path towards a global solution to reduce aviation greenhouse gas emissions. Specifically, the ICAO Council agreed to form a special High-level Group to provide recommendations on the feasibility of a global market-based measure (MBM) scheme appropriate to international aviation, as well as its development of a policy Framework to guide the general application of any proposed MBM measures to international air transport activity.

Citing that ‘stopping the clock’ would create space for the political negotiations required to formulate a global solution, the Commission stressed that in the event of the ICAO Assembly failing to move forward the EU ETS legislation would be applied in full again from 2013 onwards.

The moratorium for international flights did not, however, remove the requirement on all airlines operating at EU airports to provide emissions data, due by the end of April 2013. By May 2013, according to reports, the European Commission stated that "aircraft operators responsible for over 98% of the 2012 aviation emissions covered by the EU ETS have successfully taken the necessary steps to date to comply with the EU ETS legislation”.

Environment

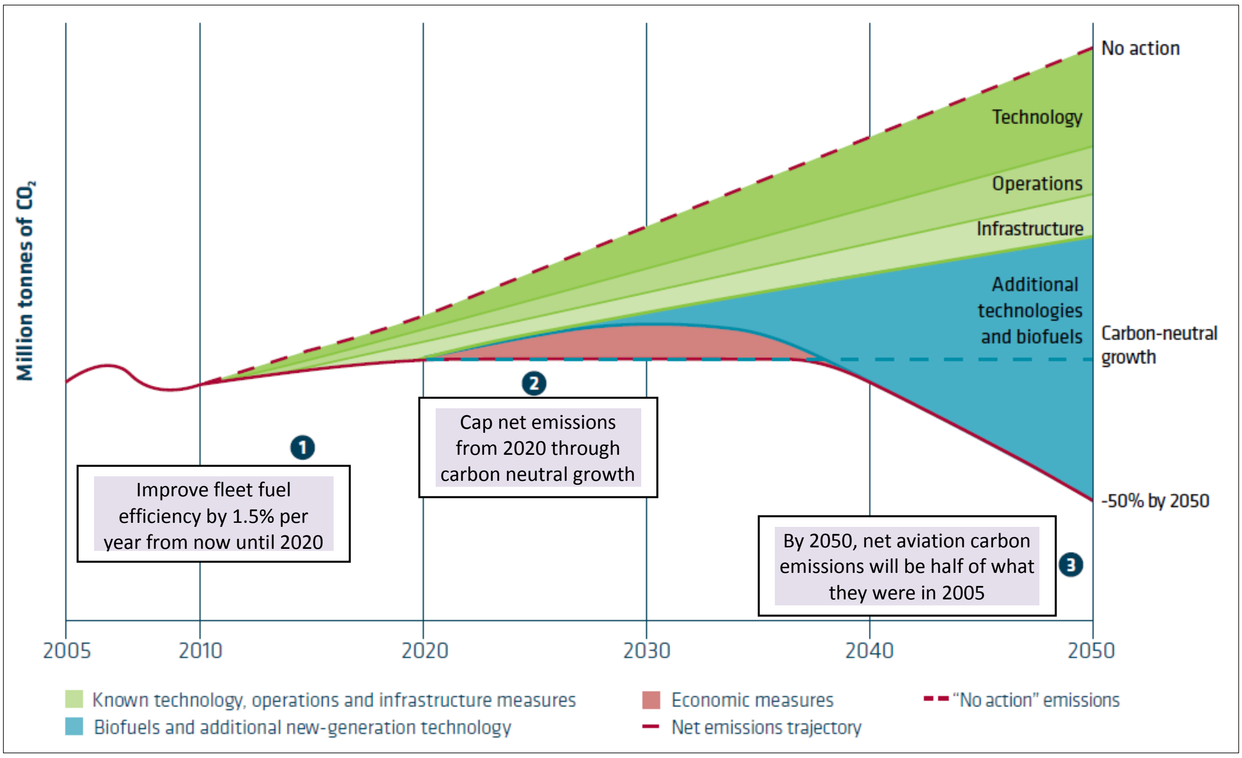
In June 2012, Rio de Janeiro hosted the United Nations conference on sustainable development (UNCSD), the Rio +20 conference. ICAO was an active participant at this event and showcased some of the developments that aviation as an industry has achieved and is aspiring to achieve. Indeed, ICAO marked the event by laying on a landmark series of connecting commercial flights powered by sustainable alternative fuels starting in Montreal and finishing the journey in Rio, carrying the ICAO Secretary General, other dignitaries, media and ordinary passengers.

The SESAR Joint Undertaking collaborates with the US Federal Aviation Administration (FAA) and a number of European and North American partners in an international programme for the reduction of aircraft emissions (AIRE - Atlantic Interoperability Initiative to Reduce Emissions). In 2012, nine new projects were selected as part of the AIRE 3 cycle taking place from 2012 to 2014.

In its November 2012 position paper, “A Sustainable Flightpath Towards Reducing Emissions”, ICAO reaffirmed the industry’s commitment to achieve a pathway to carbon-neutral growth. The organisation recognised that to achieve the targets the industry has set itself requires a multi-faceted approach and commitment from all stakeholders.

Achieving emissions reductions will focus on the four pillars of Technology, Operations, Infrastructure and Economic Measures. The aviation industry’s commitments are mapped out, as shown in the Figure below.

Mapping out the industry commitments to achieving emissions reductions



Source: ICAO

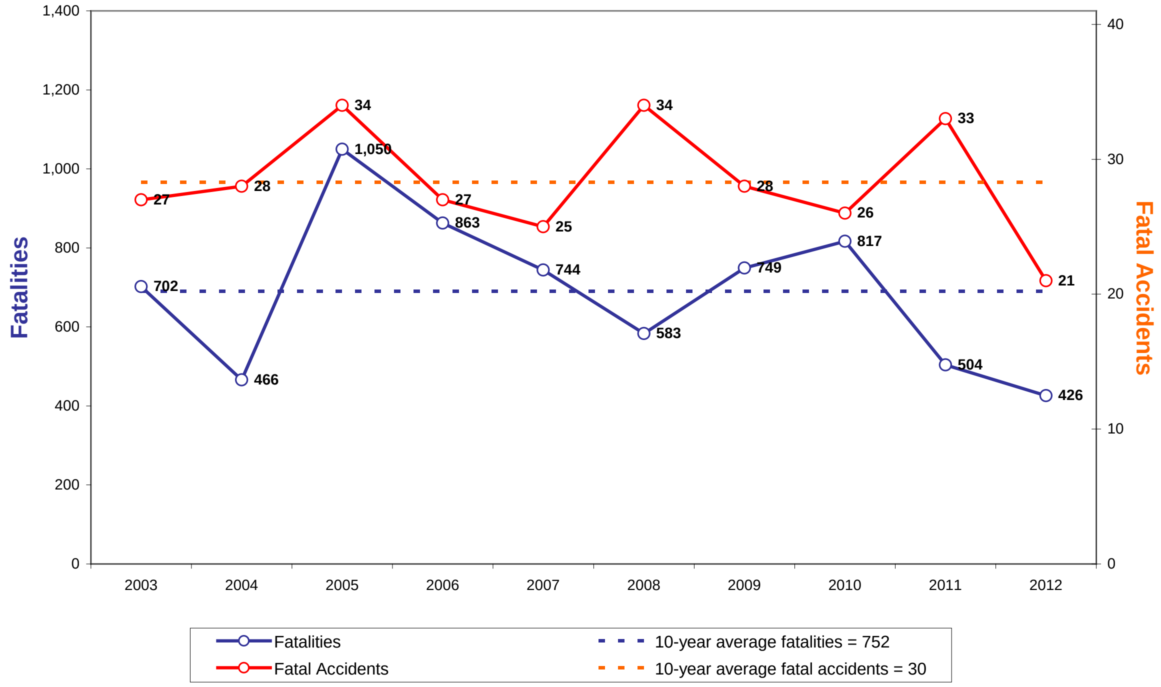
Safety

In 2012, there were 21 fatal commercial airline accidents worldwide causing the deaths of 426 passengers and crew. This spans all types of commercial airline operations, including scheduled and non-scheduled passenger flights, by jets and turboprop aircraft greater than 5,700kg; and non-passenger operations such as cargo or positioning flights. By comparison, in 2011, there were 33 fatal commercial airline accidents causing 504 deaths.

At 21, the global number of commercial airline fatal accidents in 2012 is the lowest in recent history and represents a major achievement. The number of fatalities from these accidents in 2012 also represents a historic low. But it is too early yet to say whether this part of a new declining trend.

Of the 21 fatal accidents in 2012, 5 (24%) occurred during take-off or climb, 2 (10%) en route and 14 (67%) during approach or landing. The 2012 percentages of fatal accidents by phase of flight show a higher proportion of accidents during approach and landing compared to 2011, but a lower percentage of accidents in the en route phase.

World Commercial Airline Fatal Accidents and Fatalities 2003 to 2012



Source: Flight International based on Ascend/Flightglobal

Although 2012 has been an exceptional year in statistical terms, the accident record still demonstrates many of the characteristics of recent years in that the serious accidents are occurring in airlines whose names are unknown outside their local regions, most of them in developing economies. The safety performance disparity between established carriers (such as IATA member Airlines) and others appears to be growing.

One of the regions of most concern is Africa which saw nearly a 60% increase in the hull loss accident rate from 8.1 accidents per million flights in 2011 to 12.7 accidents per million flights in 2012. In December 2012, IATA reported that the African accident rate had varied between 3 and 12 times worse than the world average – yet its traffic only constituted a 2.5% to 3.5% share of global traffic.

Air Cargo Security

Around 50 million tonnes of air cargo were transported in 2012, representing around 35%, by value, of global trade. Over half of that air cargo was transported on passenger aircraft.

On 1 February 2012, Regulation (EU) No 859/2011 regarding security measures on air cargo and mail coming from non-EU countries became applicable. This Regulation provided a basic framework for the designation of EU and non-EU air carriers as so-called ACC3, which allows them to carry cargo or mail into the Union from a non-EU airport. The Regulation also introduced rules for air cargo and mail being carried to Union airports from those so-called third countries in order to:

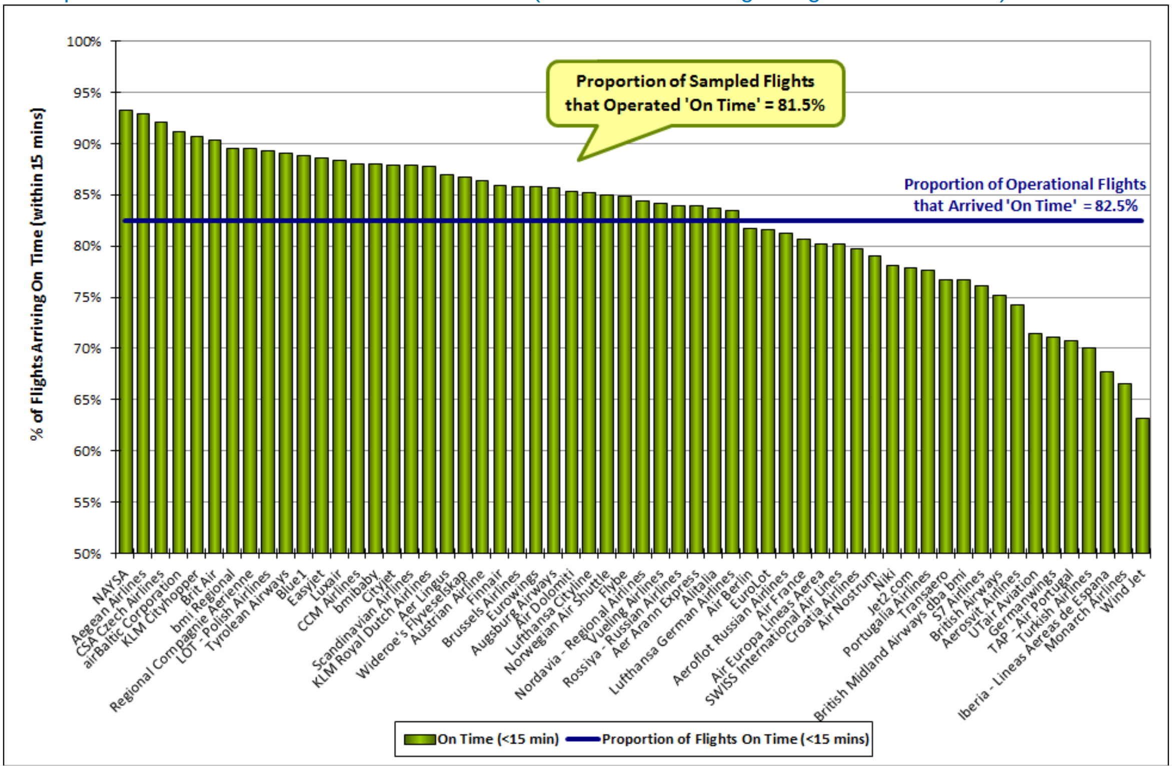
- Protect civil aviation that was carrying such cargo or mail from acts of unlawful interference; and,
- Work towards achieving enhanced cooperation on aviation security, supporting the implementation and application of standards and principles in third countries equivalent to those of the Union where this was effective to meet global threats and risks.

Punctuality and Delays

Airlines

The figure below reflects the annual arrival performance of European carrier scheduled flights, as sampled and reported by FlightStats. Whilst the overall average proportion of all operating flights (planned flights, after excluding those cancelled & diverted) that arrived ‘On Time’ in 2012 was 83%, the median indicates that 85% of all scheduled flights arrived ‘On Time’. Cancelled and diverted arriving flights accounted for 1.1% of total sampled flights.

2012 European Carrier ‘On Time’ Arrival Performance (Scheduled Passenger Flights within 15 min)



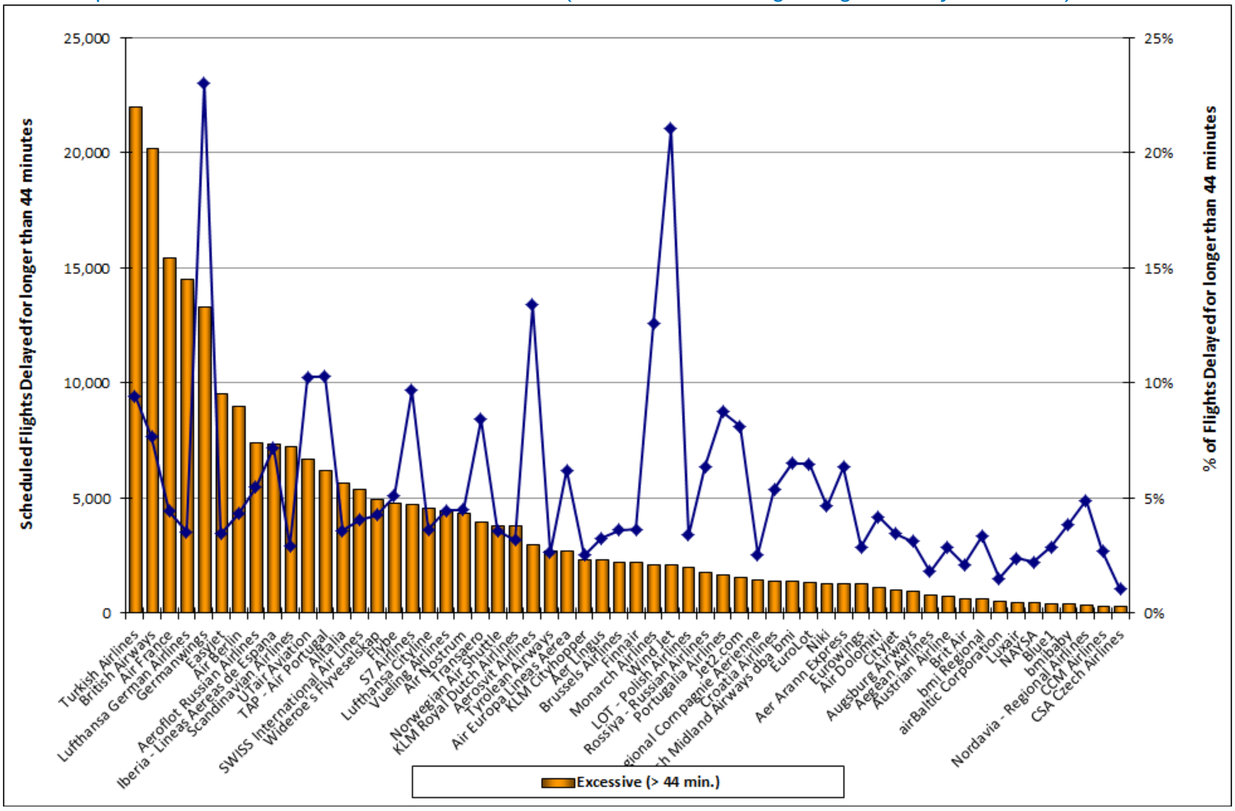
Source: www.flightstats.com

The European carriers appearing top of the list achieving ‘On Time’ punctuality performance in excess of 90% of scheduled operations were NAYSA, Aegean Airlines, CSA Czech Airlines, Air Baltic, KLM Cityhopper & Brit Air. In contrast, the five carriers ranked at the bottom half of the performance table achieved overall average ‘On Time’ punctuality equal to 69.4%; a 22 percentage point difference vs. the ‘‘On-Time’’ punctuality of the top European performers.

The overall punctuality results indicate a 1.3 year-on-year percentage point improvement in arrival punctuality performance across all sampled operational scheduled flights. The European carriers that recorded the highest percentage point improvement versus last year are Iberia (+15.5%), Air Europa (+9.1%) and Lufthansa Cityline (+8.5%). Despite Iberia's notable improvement in punctuality performance, the carrier is still positioned at the lower half of the performance table. In the opposite end of the spectrum, the airlines whose performance notably declined compared to 2011 are: Germanwings, TAP Air Portugal and Turkish Airlines, which respectively recorded a 13.7%, a 6.3% and 5.6% points decline in the share of arrival flights arriving 'On Time'.

In addition to data for 'On Time' arrivals (flights arriving within 15 minutes of the scheduled time), FlightStats also collects data for longer delays, cancellations and diversions.

2012 European Carrier 'On Time' Arrival Performance (Scheduled Passenger Flights Delayed >44min)



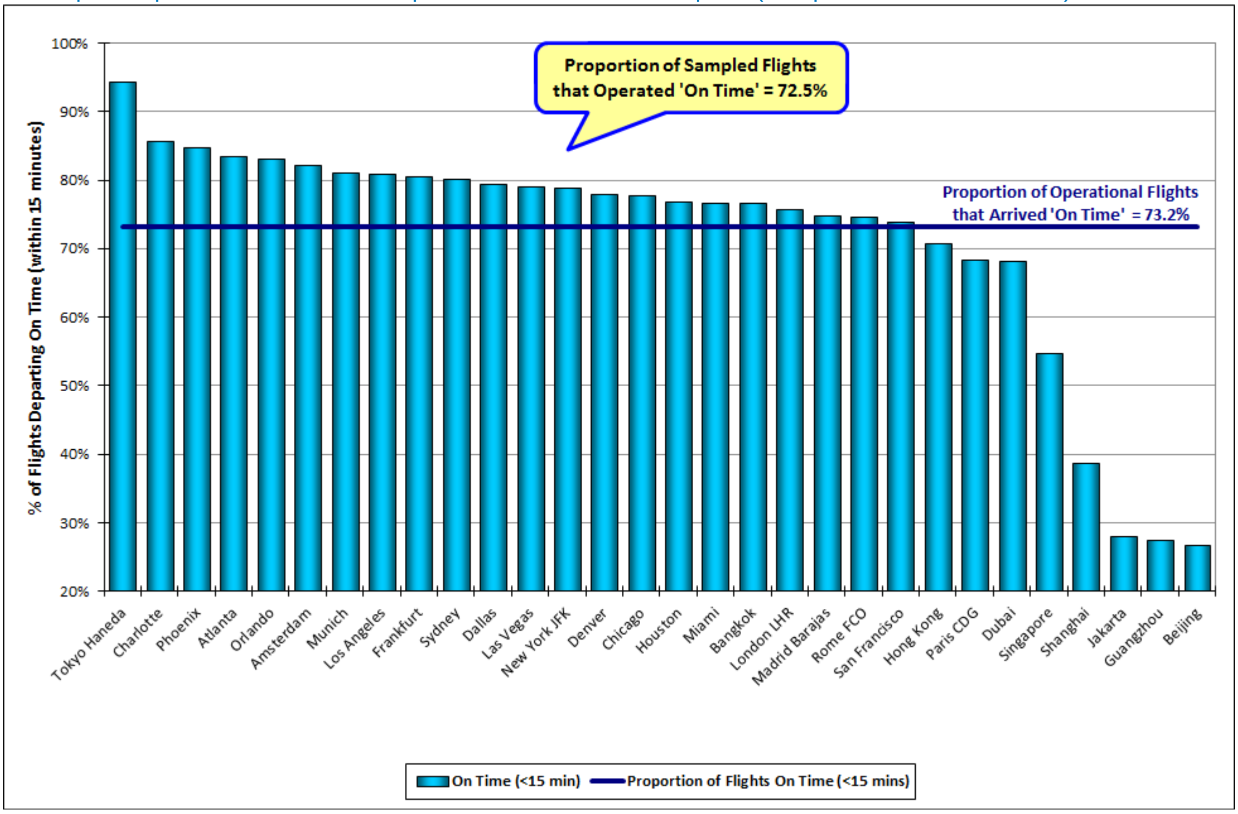
Source: www.flightstats.com

Airlines with the highest volume of long delays were Turkish Airlines (TK), British Airways (BA), Air France (AF), Lufthansa (LH) and Germanwings (4U). BA, AF and LH also appeared in the top five European carriers for 'Excessive Delays' for the previous year. The first four carriers are full service network airlines operating a hub and spoke business model from major European hub airports. Airport delays can be attributed to the airports themselves due to airspace congestion in the surrounding area as well as runway and infrastructure capacity issues in some cases. However, these longer delays should be taken in the wider context of the proportion of flights operated. Of the carriers mentioned, the share of TK flights experiencing excessive delays is 9% of overall arriving flights, with the same figure for BA being at 8% of arrivals, while the excessive flights quoted for AF and LH only reflect 4% of their arriving operations. For Germanwings on the other hand, almost one in four flights arrives 44 minutes after the scheduled arrival time.

Airports

In 2010, no European airports appeared in the top twenty; in 2011 this situation improved with London Stansted coming second after top global performer Tokyo Haneda, with Amsterdam and Munich also recording significant improvements. In 2012, the list was amended to reflect performance results from the top 30 world airports (vs. the top 50 in the previous years). In 2012, the main network carrier European hub airports (Amsterdam, Frankfurt, Heathrow, Paris CDG and Madrid) achieved between them an average ''On-Time'' departure punctuality of 76.3%. This reflects a collective improvement of 2.7% point on 2011, and 8.9% vs. 2010. The best European 'hub' performance was achieved by Amsterdam for the second consecutive year, with 82.3% (+1% point YoY) of departures on time. The four airports achieving the highest YoY improvement in punctuality performance on departing flights out of major North American Airports were: Miami (+21.5% points YoY), Dallas (+21.3% points YoY), Chicago (+13.2% points YoY) and New York JFK (+9.8% points YoY). In contrast, departure punctuality significantly declined for the major South East Asian airports of Jakarta (-57% points YoY), Guangzhou (-11.6% points YoY), Beijing (-7.8% points YoY) and Bangkok (-7.2% points YoY).

2012 Airport Departure Performance Report for World's Busiest Airports (Sampled Scheduled Airlines)



Source: www.flightstats.com

1. Air Traffic Trends

1.1 Introduction

This chapter on air traffic trends has two central aims: firstly, it is intended to deliver the highlights of 2012 in terms of air traffic developments and provide a broad high-level overview of the impacts of key events during the year; secondly, the foundation will be provided for the remainder of the report, introducing certain themes, issues and trends which will be explored and analysed in greater detail and definition in subsequent chapters.

Because of the global nature of the air transport industry, developments in one geographical region can have far-reaching implications in others. In respect of this dynamic, the objective of this section will be to analyse the key air traffic developments and events of 2012 by world region and placing them into a global context, paying particular attention to the impact on the European air transport market.

Air traffic is a broad term, but for the purposes of this section it is defined as including and being limited to:

- Commercial air passengers;
- Commercial air transport movements;
- Commercial air cargo

A variety of industry sources, using different 'cuts' of air traffic data will be used in this section to elicit trends. From the airport perspective, air passenger throughput, air transport movement figures and air cargo tonnage data are drawn upon. Airline traffic data will also be used in analyses in the form of revenue passenger kilometres (RPK) and freight tonne kilometres (FTK). It is important to note at the outset that airport and airline traffic data may not necessarily correspond with each other due to the different sources used. When compiling air traffic statistics on an aggregate level, be it passengers by geographical region or air cargo tonnes uplifted by airline alliance, the base data is either airport passenger throughput or airline passenger uplift – a straight comparison will not produce an exact match.

For example, total European Union air passenger traffic can be calculated by aggregating Member States' airport throughput, but also by aggregating Member States' airline passenger uplift – the two results will vary. As far as is practicable, this section will endeavour to compare datasets of the same origin (like with like).

1.2 Overview of 2012

2012 was largely a positive year for air travel demand across the world regions.

The International Civil Aviation Organisation (ICAO) stated airlines of its 190 member states handled 2.9 billion passengers in 2012, a 5.5% year-on-year increase on 2011.

Airports Council International (ACI) reported that 5.75 billion passengers[2] passed through its 1,345 member airports worldwide, an increase of 4.4% over the previous year.

[2] Total Passenger figures refers to 'Terminal' plus 'Transit' Passengers as identified by ACI. A portion of airports do not report purely Terminal passengers but do report Total passengers (Terminal + Transit), so Total Passengers are used in this analysis.

Table 1-1: 2012 Worldwide Airport Traffic Summary

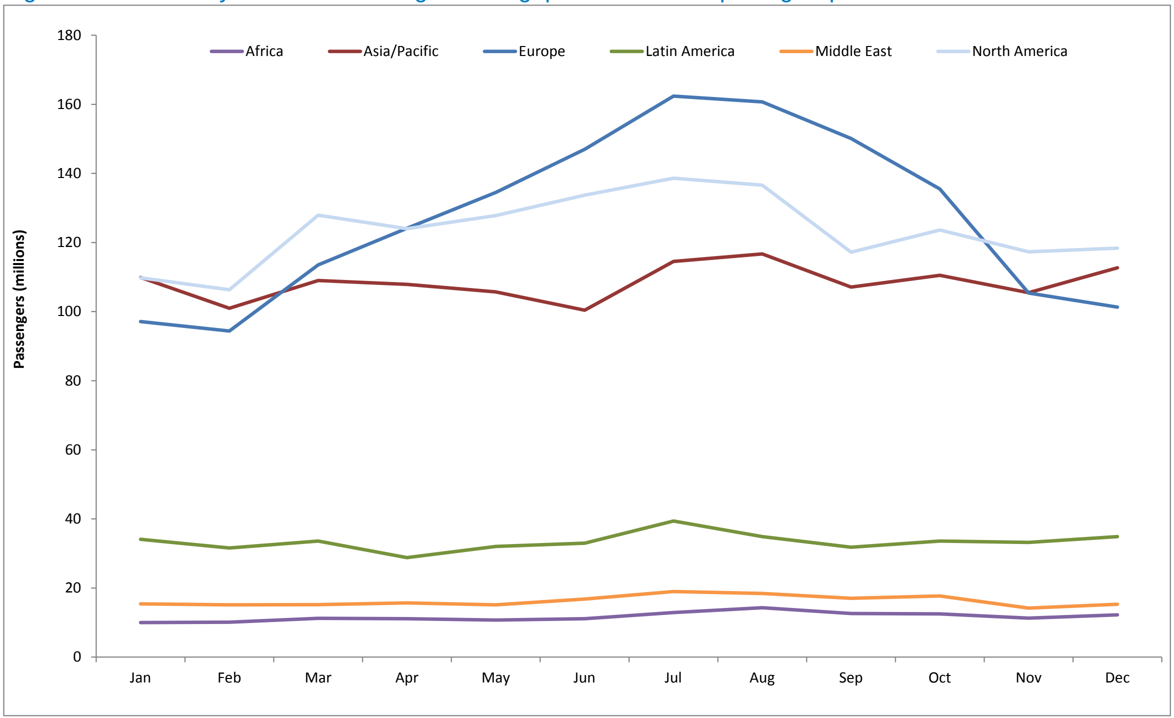
	Passenger throughput (m)			ATMs (m)			Cargo tonnes (m)		
Region	2011	2012	% chg	2011	2012	% chg	2011	2012	% chg
Africa	154.1	163.5	6.1%	2.2	2.1	-1.5%	1.8	1.8	0.0%
Asia Pacific	1,583.5	1,709.7	8.0%	9.7	10.3	6.0%	33.8	34.2	1.3%
Europe	1,587.4	1,615.9	1.8%	16.3	16.0	-1.5%	18.2	17.8	-2.4%
Latin America	413.1	444.4	7.6%	5.0	5.4	6.3%	5.0	5.0	-0.1%
Middle East	224.6	253.8	13.0%	1.8	1.9	6.6%	5.6	5.9	4.3%
North America	1,542.1	1,562.3	1.3%	20.1	19.8	-1.4%	27.9	28.3	1.2%
ACI Total	5,504.7	5,749.6	4.4%	55.1	55.5	0.8%	92.4	93.0	0.6%

Source: ACI Worldwide Airport Traffic Report

Air travel demand in 2012 was relatively uninterrupted by any major global events. Although there existed variations in the monthly growth rates versus the previous year, these were mainly attributable to the distorting effects of several major regional events during the course of that year, namely the North African / Middle East political uprisings and the Japanese earthquake. Figure 1.1 and Figure 1.2 plot 2012 airport passenger throughput[3] and growth by month, by world region.

In Figure 1.1, the seasonality profile is more pronounced for European air traffic demand, highlighting the significant peak in leisure air travel during the European summer months, more so than in any other region.

Figure 1.1: Monthly 2012 Air Passenger Throughput at all ACI Reporting Airports



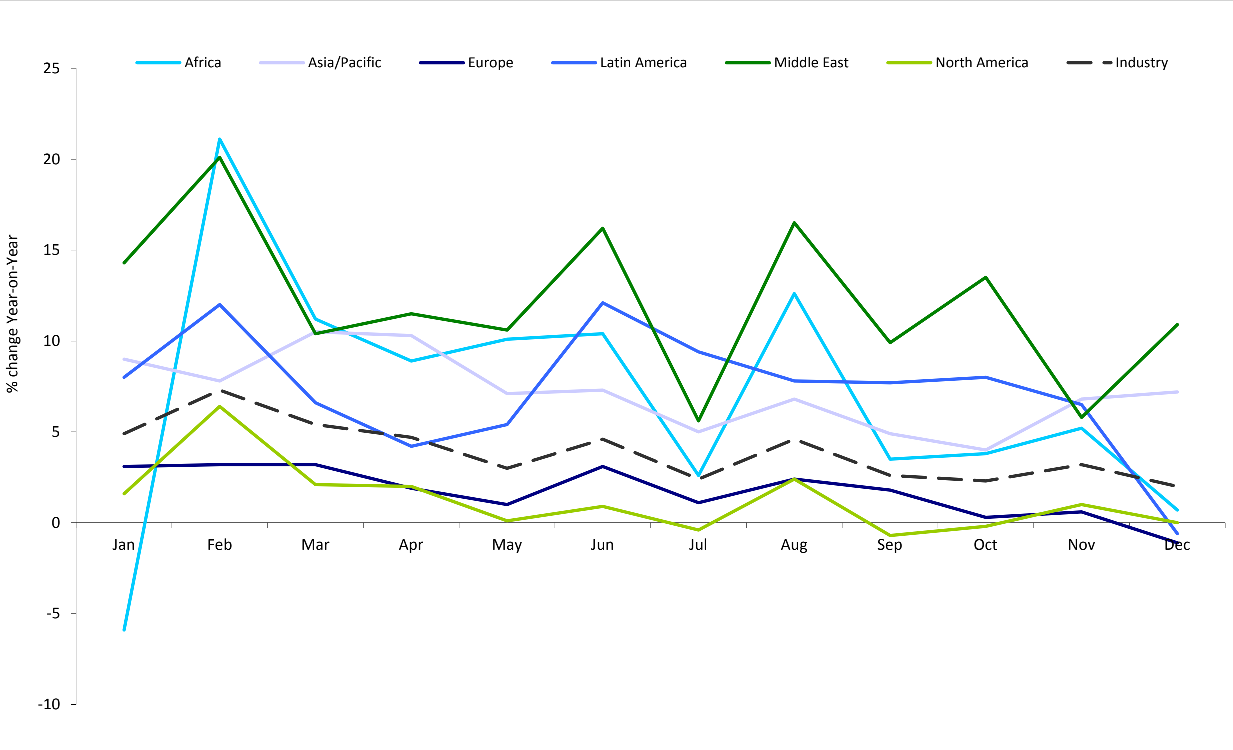
Source: ACI Monthly Worldwide Airport Traffic Reports, January-December 2012

[3] Provisional data from Airports Council International – data for December 2012 based on 74% of all ACI reporting airports

Figure 1.2 below illustrates year-on-year growth by month of 2012, by global region. When considering general trends in air travel demand, 2012 continues the pattern seen in previous years of European and North American growth lagging that of the Middle East, Asia Pacific and Latin America. The high growth rates for Africa and Middle East at the beginning of the year are mostly due to the distorting impact of the 'Arab Spring' a year earlier. Similarly, the upturn in growth in March for the Asia Pacific region is mostly attributable to the Japanese earthquake hitting growth in March 2011.

In North America, lower than expected business and consumer confidence hit air travel demand, while in Europe the impact of the economic downturn continued to be supressing growth in air traffic throughout the year.

Figure 1.2: Monthly 2012 Airport Passenger Throughput Growth Rates



Source: ACI Monthly Worldwide Airport Traffic Reports, January-December 2012

According to ICAO, total scheduled air passenger traffic (measured in revenue passenger-kilometres [RKPs]) increased by 5.5% overall in 2012, which reflects a slight slowdown on growth in 2011. ICAO opines that, while this result reflects positive economic scenarios worldwide, it has come despite sluggish economic growth in the mature markets and the implementation of fiscal austerity policies in key European economies.

The largest percentage growth in total air traffic was registered by the airlines of the Middle East with 16.8%, followed by those of Latin America (8.4%) and Asia Pacific (6.9%).

Table 1-2: ICAO Member State Airlines RPK Growth by World Region 2012

Region	International		Domestic		Total			
	Traffic Growth % vly	Market Share %	Traffic Growth % vly	Market Share %	Traffic Growth % vly	Market Share %	Capacity Growth (ASKs) %	Load Factors
Africa	7.4	3	2.3	1	6.7	2	5.2	67.8
Asia/Pacific	5.5	27	8.8	35	6.9	30	5.9	76.6
Europe	5.6	39	-0.7	8	4.9	27	2.5	79.4
Middle East	17.3	13	7.9	1	16.8	8	11.6	79.4
North America	1.3	14	1.2	49	1.2	27	0.7	82.5
Latin America/ Caribbean	11.7	4	5.3	7	8.4	5	6.1	74.6
WORLD	6.5	100	3.9	100	5.5	100	4	78.8

Source: ICAO

International traffic (6.5%) grew at a faster pace in 2012 than domestic (3.9%). The largest international market in terms of share is Europe (39% of total International RPKs), followed by Asia Pacific (with 27% share). In 2012, these two regions achieved similar growth in international air traffic, but diverged significantly on the performance of their domestic markets. Growth in domestic airline RPKs in Europe was actually negative, albeit the size of the market is relatively small (8% share) compared to others. However, domestic traffic within Asia Pacific accounts for 35% of the global total (second only to North America), and this segment grew at an impressive 8.8%. Within this segment, the fast-growing domestic markets of China, India and Indonesia all contribute to this overall expansion.

The North American domestic market accounts for half of all domestic traffic, worldwide. Although RPK growth was low (1.2%), capacity growth was even lower (0.7%), reflected in the highest Load Factors (82.5%) of any region in 2012.

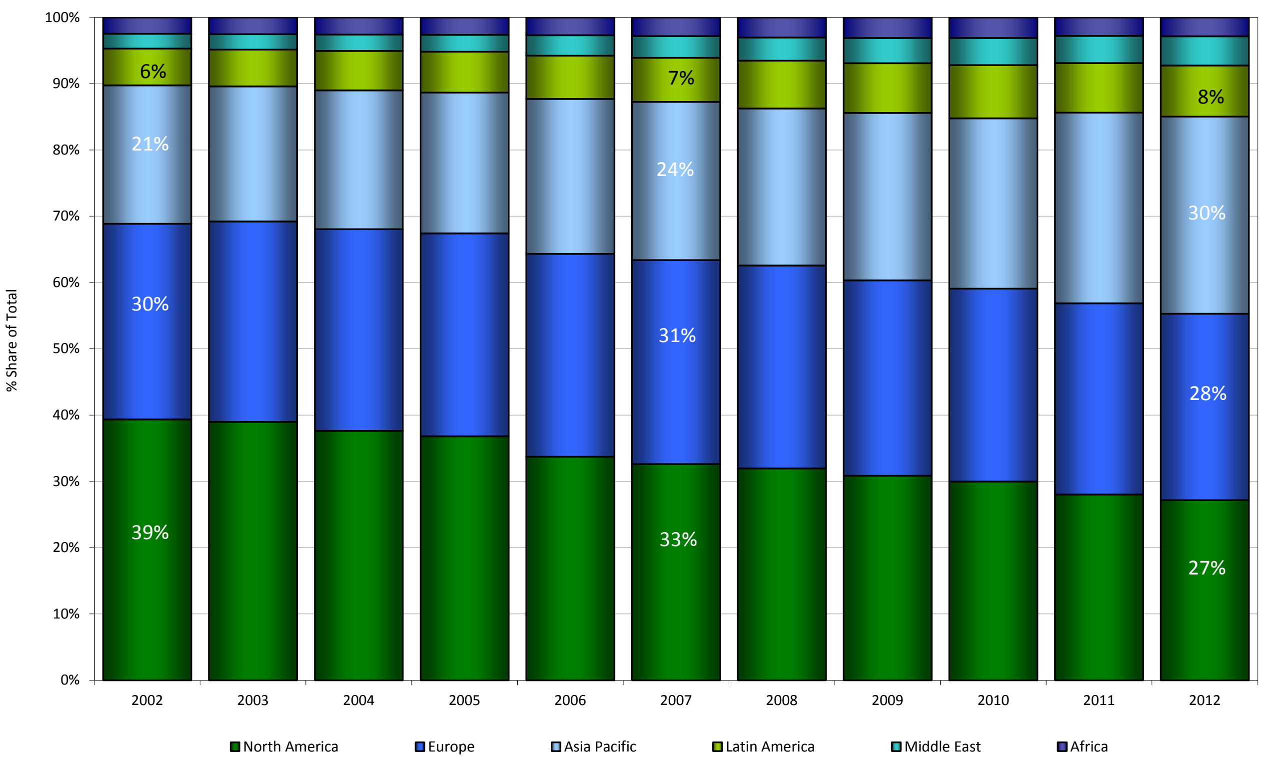
1.2.1 Historic Air Passenger Traffic trends

Figure 1.3 below illustrates the relative growth or decline in airport passenger throughput market share, by global region, between 2002 and 2012. From the graphic it is immediately apparent that over the last decade there has been a demonstrable shift in the focus of growth in a regional context.

By analysing global airport passenger traffic data from ACI, we can observe that at the beginning of the previous decade, North America's airports commanded the greatest market share of passengers, reflecting both the pre-eminence of its domestic market and also the extent and development of its international network. The European market was a clear second, some distance behind North America but also significantly ahead of Asia Pacific, which, at this stage, was a relatively immature market yet to unlock its full potential.

Fast forward ten years to 2012 and the landscape has changed as Asia Pacific, dominated by vast, rapidly growing domestic markets in China, India and Indonesia, has transformed the region on the global stage. 2012, for the first time, saw Asia Pacific assume status as the leading global air transport market.

Figure 1.3: Evolution of Global Airport Passenger Throughput 2002-2012

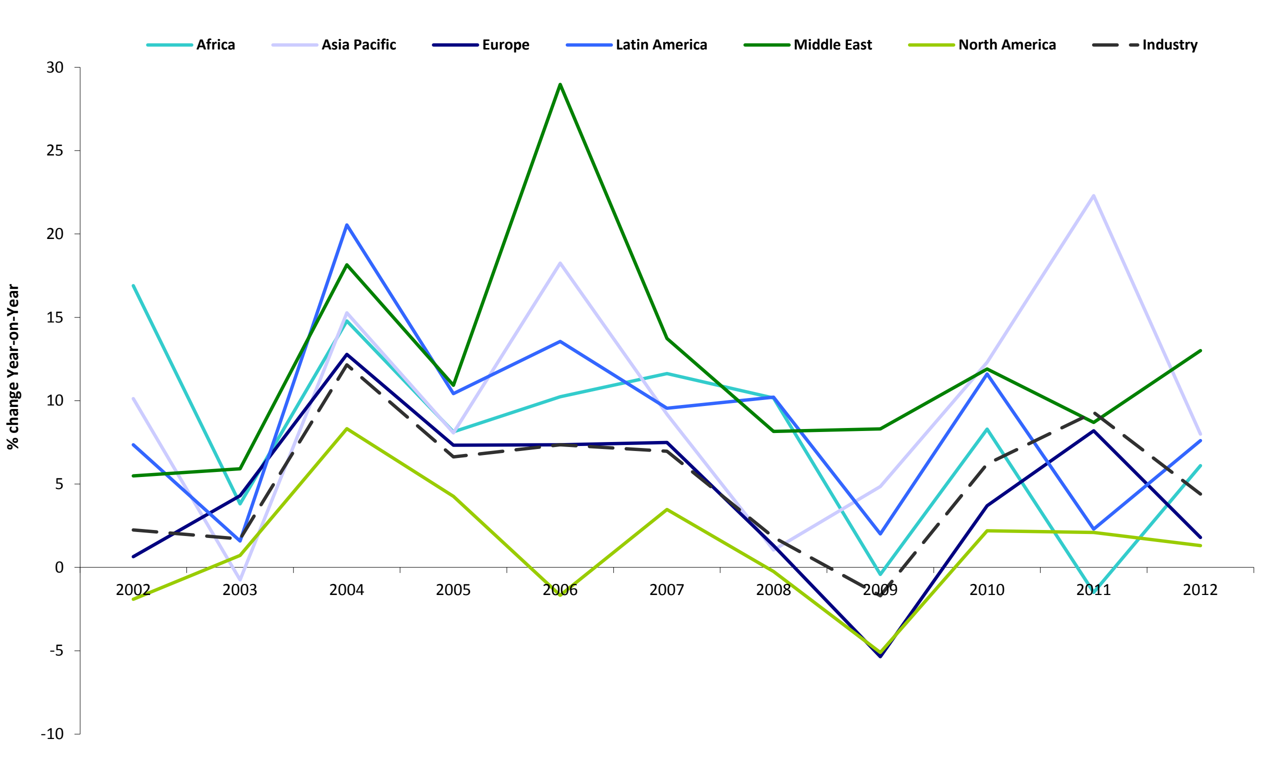


Source: ACI Worldwide Airport Traffic Report

Placing air passenger traffic growth in 2012 in a historical context (see Figure 1.4), we can see that over the course of the last decade the underlying trend has been one of positive growth, albeit fairly erratic due to a variety of external 'shock' events. The industry declines experienced in 2003, 2009 and 2011 (mainly attributable to the SARS epidemic, global economic downturn and 'Arab Spring', respectively) remind us that air travel demand is explicitly vulnerable to exogenous events.

Equally evident is the resilience of the industry in 'bouncing back' after these shocks – note the sharp increase in overall growth in 2004 and 2010, in particular, following the shocks of the preceding years.

Figure 1.4: Airport Passenger Throughput Growth at ACI Reporting Airports 2002-2012



Source: ACI Worldwide Airport Traffic Report

1.2.2 Economic Growth & GDP

Economic growth is recognised as being the key driver for air traffic demand growth, passenger travel and air cargo.

The International Monetary Fund (IMF) records economic growth, measured in Gross Domestic Product (GDP), for individual nations and various geographical/political groupings. The groupings shown in Table 1-3 below represent a broad cross-section of the world. In a European context, sub-regions have been broken out and analysed individually, to identify differences in growth within the continent.

In addition, a distinction is made between advanced economies and emerging ones in order to determine where the highest economic growth is focused in a particular region. With regions as vast and contrasting as Europe and Asia, for example, it is essential to segment the broad market into sub-markets as differences in growth will exist within them.

Table 1-3: GDP % Growth Rates for Regional Groupings – Actual & Forecast

	Actual		Forecast					
Country Group Name	2011	2012	2013	2014	2015	2016	2017	2018
Euro area	1.5	-0.6	-0.4	1.0	1.4	1.5	1.6	1.6
European Union	1.7	-0.3	0.0	1.3	1.6	1.8	1.8	1.9
Advanced economies	1.7	1.5	1.2	2.0	2.5	2.6	2.6	2.5

	Actual		Forecast					
Central and eastern Europe	5.4	1.4	2.3	2.7	3.3	3.5	3.7	3.7
Commonwealth of Independent States	4.8	3.4	2.1	3.4	3.8	3.7	3.7	3.7
Major advanced economies (G7)	1.6	1.7	1.2	2.0	2.5	2.6	2.5	2.4
Middle East and North Africa	3.9	4.6	2.1	3.8	4.2	4.1	4.2	4.4
Sub-Saharan Africa	5.5	4.9	5.0	6.0	5.7	5.6	5.5	5.7
ASEAN-5	4.5	6.2	5.0	5.4	5.5	5.4	5.5	5.5
Developing Asia	7.8	6.4	6.3	6.5	6.6	6.7	6.7	6.7
Latin America and the Caribbean	4.6	2.9	2.7	3.1	3.5	3.7	3.7	3.7
World	**3.9**	**3.2**	**2.9**	**3.6**	**4.0**	**4.1**	**4.1**	**4.1**

Source: IMF World Economic Outlook Database; October 2013 Update

Focussing on Europe, the most evident theme to note is the worsening economic situation in 2012 for the European Union and Euro area countries, where GDP growth rates were far below the world average of 3.2%[4]. Indeed, the IMF reported that these blocs were in fact in economic recession.

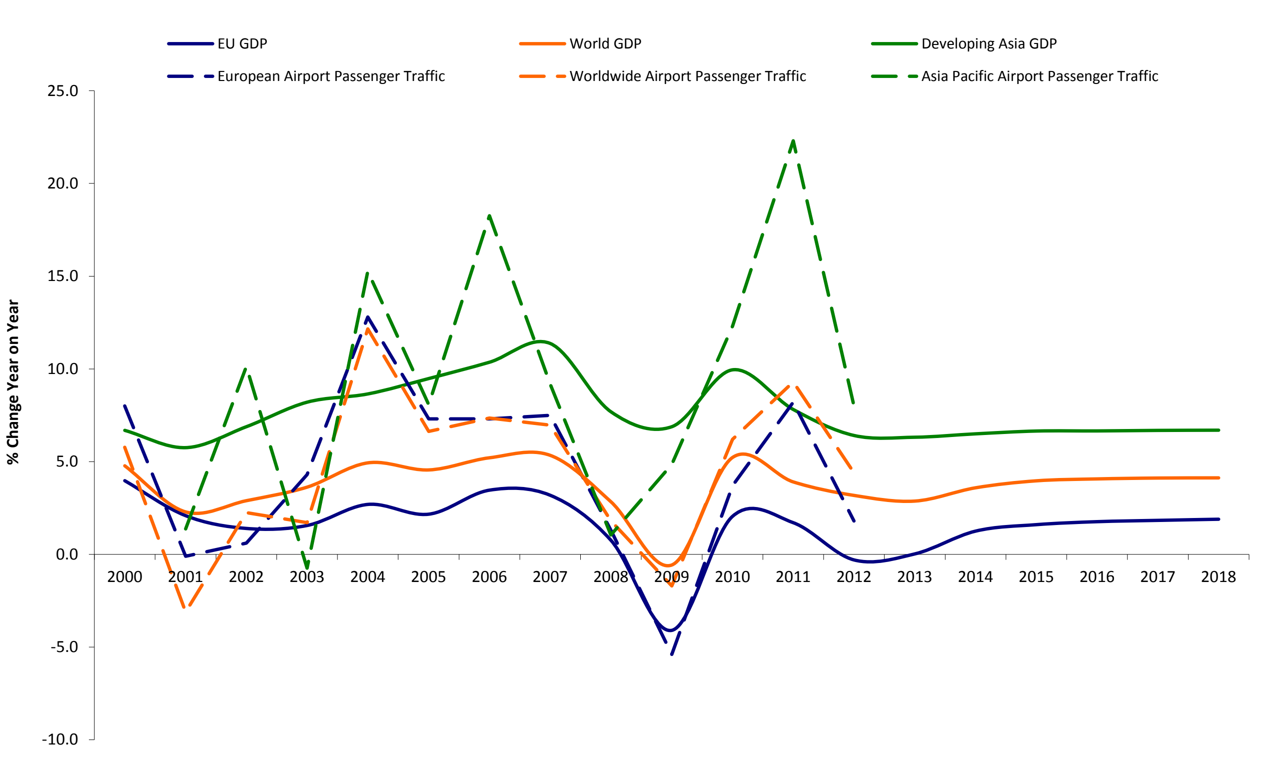
Continuing the general trend of the past several years, the highest economic growth rates in 2012 on the European continent were recorded by Central and Eastern European nations (1.4%) and the Commonwealth of Independent States (3.4%). These are mainly small, immature economies, able to remain somewhat insulated from the worst of the financial troubles impacting the EU.

Worldwide, the strongest economic growth was experienced in Asia, in particular Developing Asia which includes China and India, recording growth at double the global average of 6.4%. This does, however, represent a significant slowdown in growth from the 7.8% recorded in 2011, and mimics the global trend of solid but slower growth in 2012.

Figure 1.5 illustrates the symbiotic relationship between growth of air travel demand and economic growth. Witness the ‘tracking’ of the same coloured lines and it is reasonable to conclude that, for instance, when the global economy faltered in 2008 and 2009 and recovered in 2010, demand for air travel did likewise. It is also reasonable to conclude that where economic growth is highest, that region will also experience the highest growth in air travel demand (as demonstrated by the close correlation between ‘Developing Asia GDP’ and ‘Asia Pacific Airport Passenger Traffic’ in Figure 1.5).

[4] International Monetary Fund, World Economic Outlook Database

Figure 1.5: GDP Growth vs. Airport Passenger Growth



Source: ACI & IMF

1.3 Air Passenger Traffic Growth in 2012

1.3.1 Europe in a global context

In 2012, ACI reported that a total of 5.75 billion passengers passed through worldwide airports, an increase of 4.4% compared to 2011.

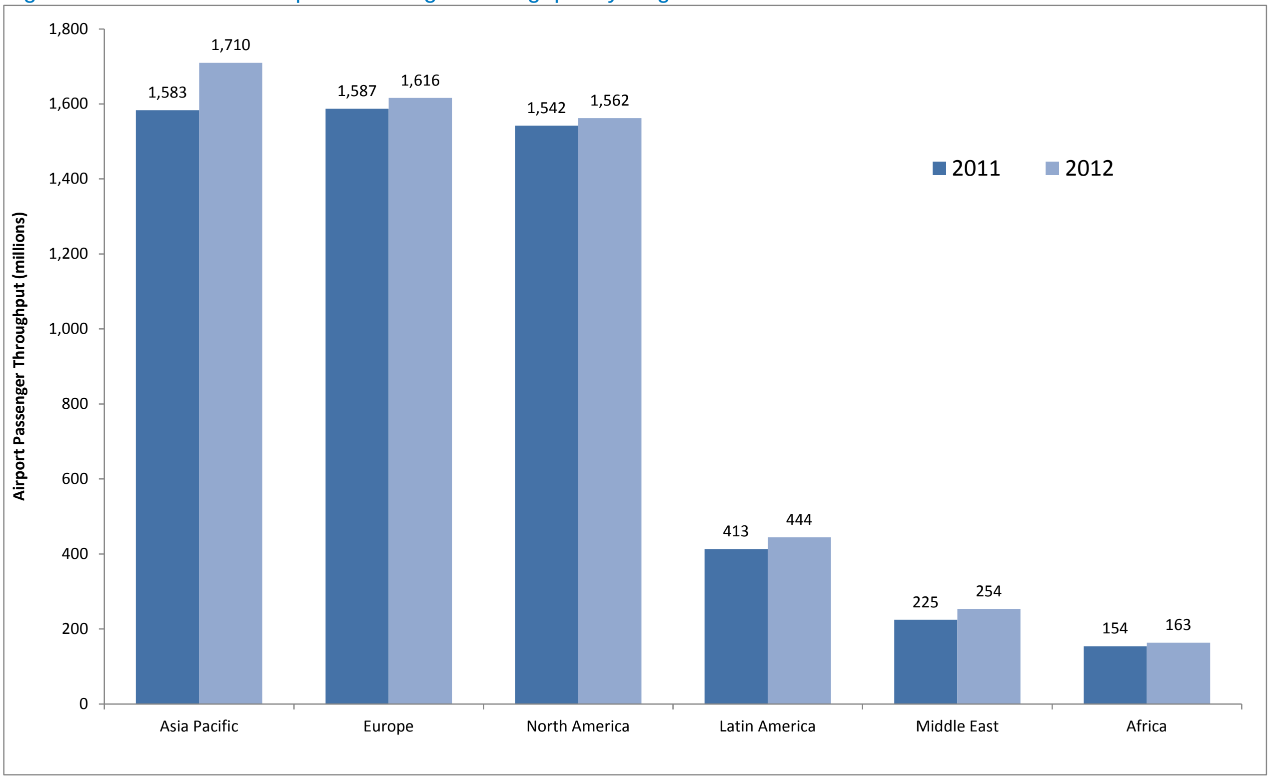
Overall, European airports performed solidly, achieving passenger throughput growth of 1.8% in 2012, in a tough economic climate. According to ACI's full year 2012 data[5], European airport passenger throughput rose from 1.58 billion in 2011 to 1.62 billion in 2012.

The European air transport market consolidated its position ahead of North America in 2012, but fell behind Asia Pacific, as this region claimed top spot ahead of it, such has been the rapid and consistent growth experienced in Asia Pacific during the past few years.

[5] ACI Worldwide Airport Traffic Report 2012

Figure 1.6 shows the relative market sizes by global region, highlighting the clear two-tier hierarchy existing on the global stage with Asia Pacific, Europe and North America competing for dominance, and Latin America, Middle East and Africa developing their emerging markets.

Figure 1.6: Worldwide Airport Passenger Throughput by Region in 2011 & 2012

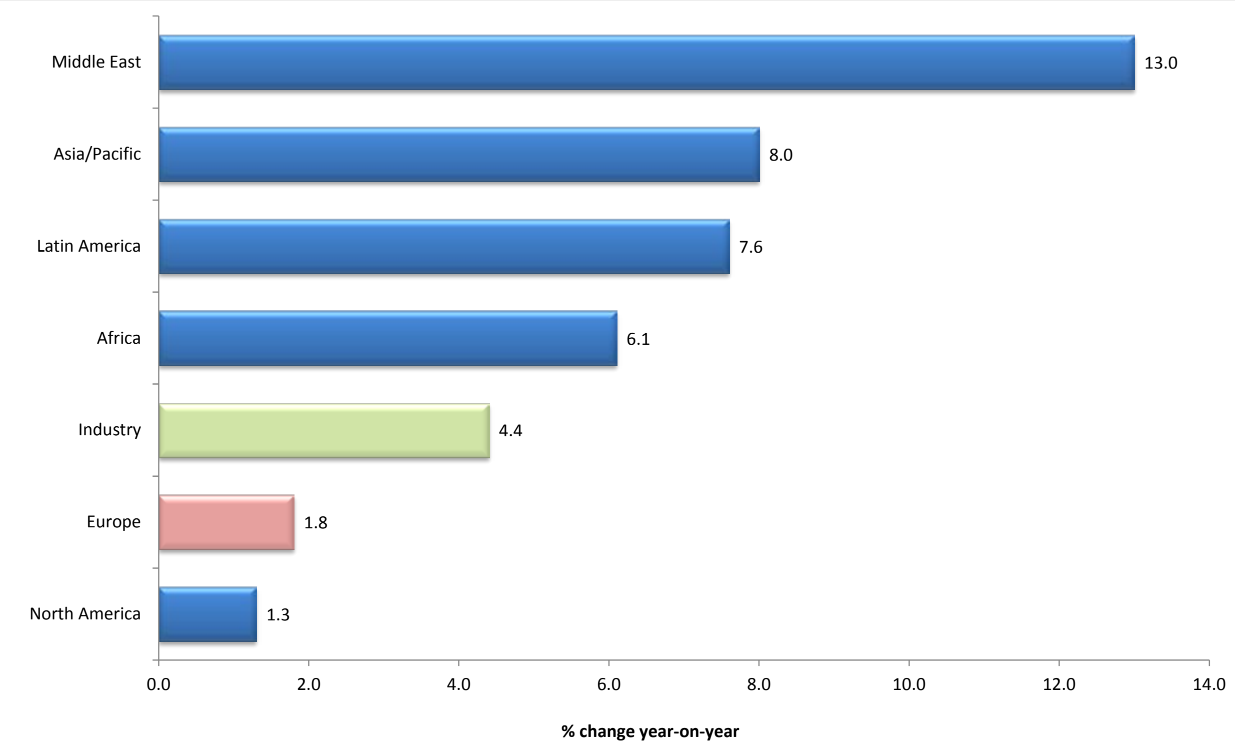


Source: ACI Worldwide Airport Traffic Report

Figure 1.7 confirms that while the 1.8% growth of Europe's airports should be considered a relative achievement in face of the non-conducive external conditions, it lagged far behind the growth of 13% year-on-year recorded by Middle East airports in 2012 – and, of more concern given the similar market sizes, the 8% achieved by Asia Pacific airports.

Europe's growth did, however, outpace that of the depressed North American airports, which posted an aggregate increase of 1.3% over 2011.

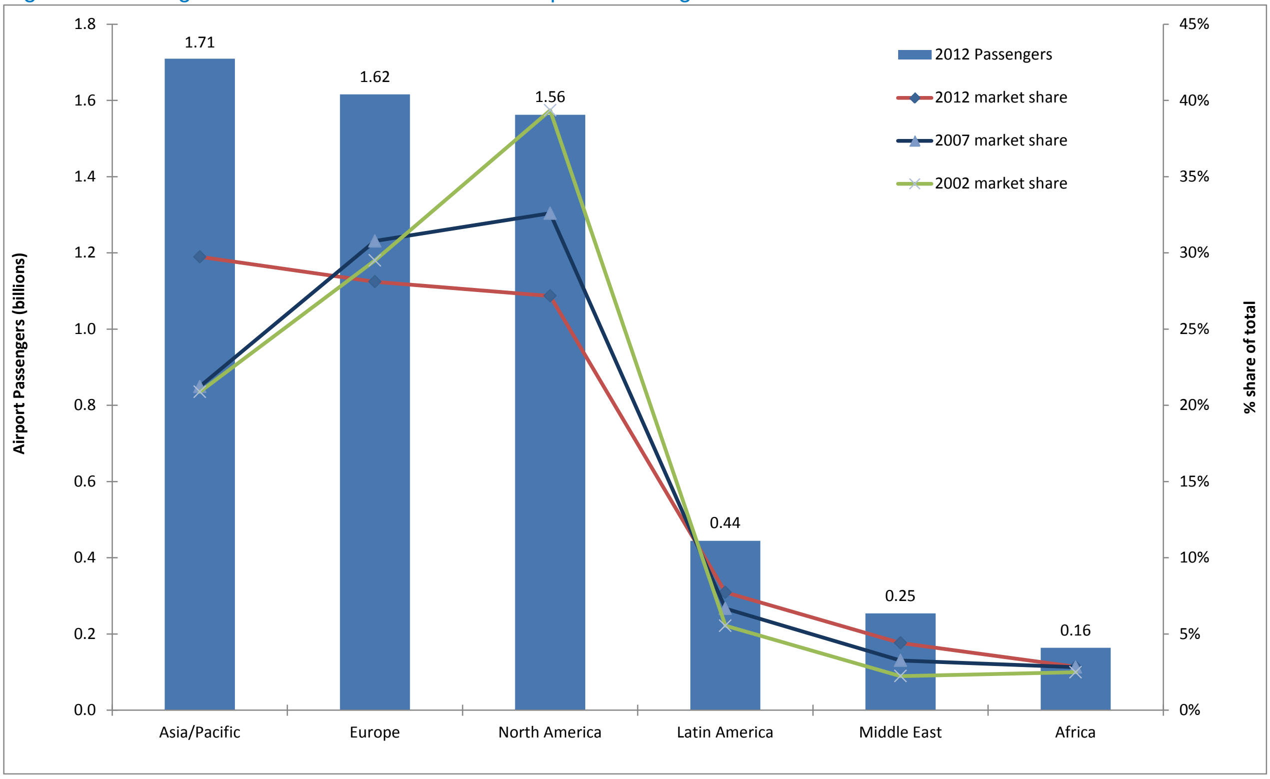
Figure 1.7: Passenger Traffic Growth (%) at Worldwide Airports by Region 2012 vs. 2011



Source: ACI Worldwide Airport Traffic Report

Figure 1.8 serves to underline the shift in the focus of growth. As recently as 2002, North American airports dominated with a market share of global passenger throughput around 40%. Since then, European and to a greater extent Asia Pacific airports have eroded that dominance and gained market share to achieve parity, and eventually overtake by 2012.

Figure 1.8: Regional Distribution of Worldwide Airport Passenger Traffic and Historic Market Shares



Source: ACI Worldwide Airport Traffic Report

Compared to the North American and Asia Pacific market shares of global air passenger traffic, Europe's has remained fairly constant in the last decade, hovering around 30% since 2002 (falling to 28% in 2012).

During this period (2002-2012), European airports have increased passenger throughput at an average annual rate of 4.9%. When the peaks and troughs are ironed out, underlying growth of over 4% per year represents a solid achievement for a mature air transport market, indicating the success of and further potential for growth into emerging markets.

However, Europe's growth must be put into context alongside the meteoric growth recorded by Asia Pacific airports over the same time period. This regions' market share of total global airport passenger throughput increased from 21% in 2002 to 30% in 2012, on the back of 9.2% average annual growth (nearly double that achieved by Europe's airports).

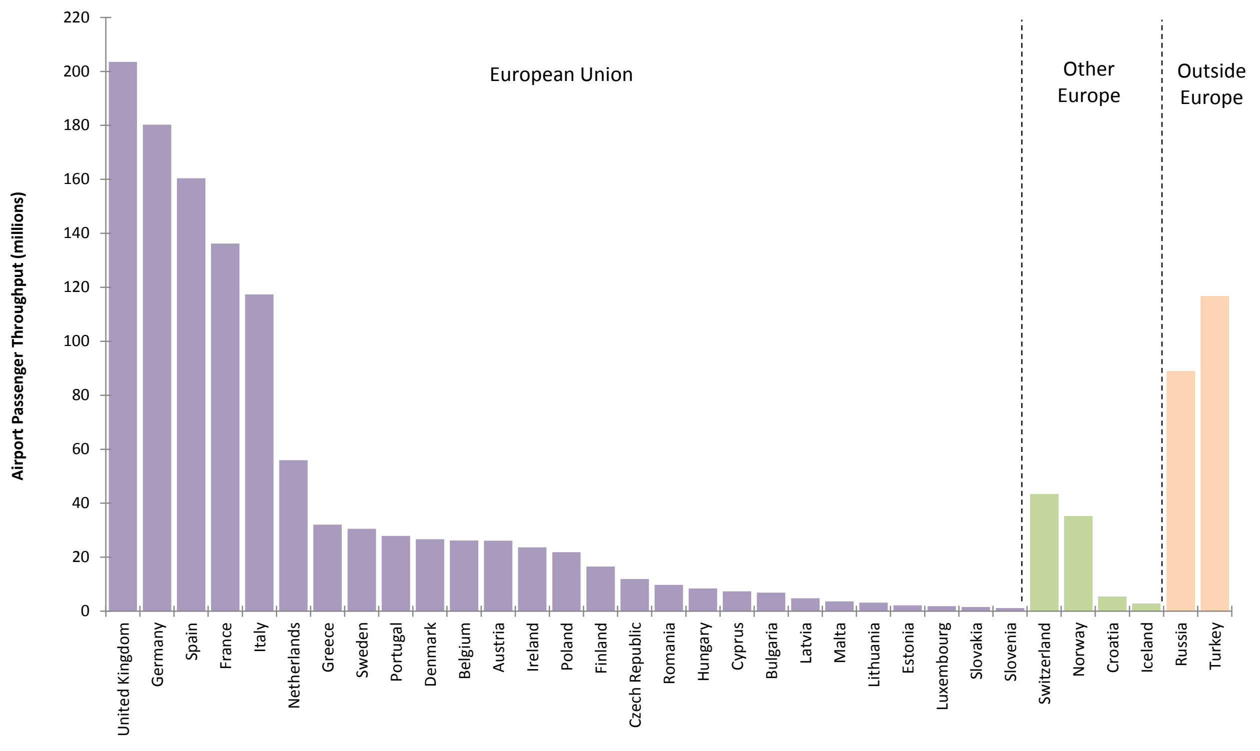
The market share gain made by Asia Pacific has been at the expense of North America. The saturated North American market has experienced sluggish growth between 2002 and 2012, growing at an average annual rate of 1.6%. Its market share reduced from 39% to 27% during this period.

This new power shift is set to continue with the Asia Pacific airports increasing in size and global importance, driven by the economic growth in China and India, as well as an increasing awareness by ASEAN of the importance of liberalisation in its air transport market.

1.3.2 The European Air Transport Market

Within Europe, there is considerable variety in the volume of air passenger traffic at an individual country basis. Figure 1.9 ranks the 27 EU member states in 2012 according to size of air transport market, and compares against ECAA states and neighbouring Turkey and Russia.

Figure 1.9: European Airport Passenger Traffic Throughput in 2012 by Country

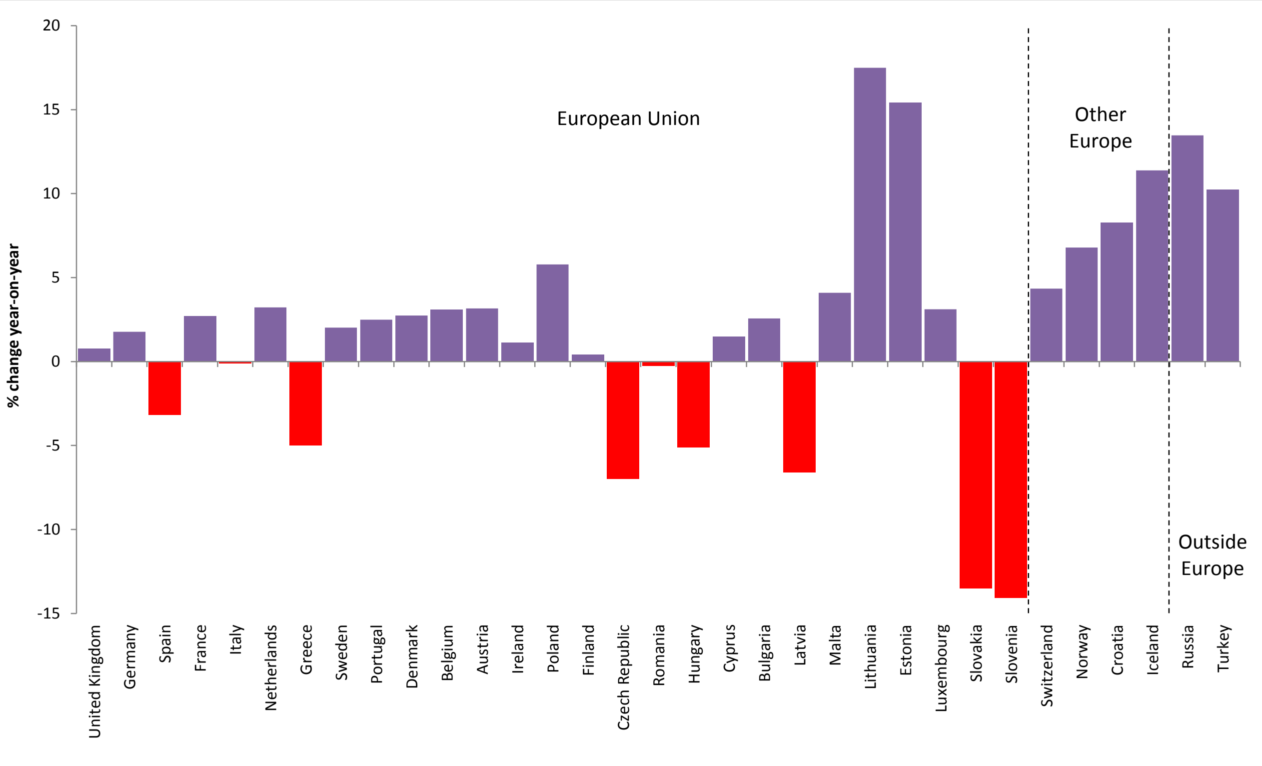


Source: Eurostat (ACI for Turkey and Russia)

Based on Eurostat data it is evident that Europe's air transport market is dominated by five countries – the UK, Germany, Spain, France and Italy. Combined, these EU member states accounted for 70% of the European Union total airport passenger throughput in 2012. The remaining 30% is distributed among 22 member states, highlighting the two tier hierarchy that exists between the mature and emerging markets within the bloc. It is interesting to note that neighbouring Turkey and Russia have expanded their air transport markets in recent years to the extent that they now rival the top five EU countries in terms of passenger volumes. Furthermore, given the rate of expansion in Turkey and Russia, the gap may reasonably be expected to close further in the near future.

This trend is illustrated in Figure 1.10 where we see growth in the Russian and Turkish air transport markets in 2012 versus 2011 outpacing all but two of the EU27 countries.

Figure 1.10: European Airport Passenger Traffic Growth 2012 vs. 2011 by Country



Source: Eurostat (ACI for Turkey and Russia)

The European Union Member States recording the highest growth in 2012 included Lithuania (17%) and Estonia (15%), reinforcing their strong performances in 2011. However, no fewer than nine of the EU27 experienced declines in 2012. The most significant of these, due to the relative size of the markets, are Spain and Greece – the economic woes of both being well documented, and having a continued negative impact on air travel demand. Although the declines in the Slovakian and Slovenian markets look dramatic in Figure 1.10, the markets are small (1.6m and 1.2m passengers in 2012, respectively) so any movement in the airport passenger throughput is going to be amplified. In the case of Slovakia, Bratislava in particular felt a hit with CSA Czech Airlines and Ryanair both cutting capacity. In Slovenia, Ljubljana traffic was negatively impacted by Adria Airways downsizing on some key routes such as Paris, London and Istanbul.

The relationship between economic growth and air travel demand can be used to justify the growth or decline in some markets (such as Spain, Italy, Greece, Turkey and Russia) but other factors including air transport market maturity; airport capacity and congestion; the policy and regulatory environment; low cost carrier stimulation; and taxation and pricing regimes will all contribute to affecting the demand for air travel, creating an uneven playing field throughout Europe allowing certain markets to flourish while others decline.

Table 1-4 observes the historical growth of passenger traffic in the EU and neighbouring countries, between 2007 and 2012. The immediate point to make is that nine out of the 27 EU member states have experienced a declining trend in air passenger traffic during this period – an alarming statistic that reveals the depth of the impact of economic and financial crises spreading across the region from 2008, severely denting demand for air travel in certain European markets.

Table 1-4: Historical European Airport Passenger Traffic Throughput by Country (millions)

Country	2007	2008	2009	2010	2011	2012	% chg '12 v '11	CAGR % 2007-2012
United Kingdom	218.6	214.9	199.2	193.5	202.0	203.5	0.8	-1.4
Germany	165.9	167.8	160.6	168.8	177.1	180.3	1.8	1.7
Spain	163.0	162.2	149.0	153.9	165.7	160.4	-3.2	-0.3
France	120.3	122.7	117.6	126.3	132.6	136.2	2.7	2.5
Italy	108.7	106.5	103.3	110.7	117.5	117.4	-0.1	1.5
Netherlands	50.8	50.7	46.7	48.9	54.2	55.9	3.2	2.0
Greece	34.8	35.1	33.4	32.6	33.8	32.1	-5.0	-1.6
Sweden	27.3	28.1	25.4	26.9	29.9	30.6	2.0	2.3
Portugal	24.1	24.8	23.8	25.4	27.2	27.9	2.5	3.0
Denmark	24.2	24.5	22.4	24.5	25.9	26.7	2.7	2.0
Belgium	21.0	22.3	21.7	23.0	25.4	26.2	3.1	4.5
Austria	23.1	24.1	22.0	23.7	25.3	26.1	3.2	2.5
Ireland	30.1	30.2	26.4	23.2	23.4	23.6	1.1	-4.7
Poland	17.2	18.7	17.1	18.4	20.7	21.9	5.8	5.0
Finland	14.4	14.8	13.8	14.3	16.4	16.5	0.4	2.7
Czech Republic	13.3	13.6	12.6	12.4	12.8	11.9	-7.0	-2.1
Romania	7.0	8.1	8.0	8.9	9.8	9.7	-0.3	6.9
Hungary	8.6	8.4	8.1	8.2	8.9	8.4	-5.1	-0.4
Cyprus	7.3	7.6	7.0	7.2	7.2	7.3	1.5	0.0
Bulgaria	6.1	6.4	5.9	6.2	6.7	6.9	2.6	2.4
Latvia	3.2	3.7	4.1	4.7	5.1	4.8	-6.6	8.5
Malta	3.0	3.1	2.9	3.3	3.5	3.7	4.1	4.2
Lithuania	2.2	2.6	1.9	2.3	2.7	3.2	17.5	7.6
Estonia	1.7	1.8	1.3	1.4	1.9	2.2	15.4	5.0
Luxembourg	1.6	1.7	1.5	1.6	1.8	1.9	3.1	3.0
Slovakia	2.3	2.6	2.0	1.9	1.8	1.6	-13.5	-7.1
Slovenia	1.5	1.7	1.4	1.4	1.4	1.2	-14.1	-5.2
EU27 Total	792.7	798.3	751.1	776.9	821.3	826.7	0.7	0.8
Switzerland	34.8	36.8	36.1	37.7	41.6	43.4	4.3	4.5
Norway	27.9	29.0	28.1	30.0	33.0	35.2	6.8	4.8
Croatia **	-	4.6	4.4	4.7	5.0	5.5	8.3	4.5
Iceland	2.5	2.2	1.9	2.1	2.5	2.8	11.4	2.3
Russia	71.6	79.1	54.4	66.9	65.2	88.9	36.4	4.4
Turkey	64.1	72.5	79.8	92.9	105.9	116.7	10.2	12.7

Source: Eurostat (ACI for Turkey and Russia); [* EU27 total removes double counting]; [**AAGR 2008-2012]
http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=avia_paoc&lang=en

The European air transport industry does not exist in isolation. Next we focus on the global scene to explore the reasons for discrepancies in air travel demand growth between worldwide regions. The following subsection investigates the variation in growth at the Top 30 airports in 2012 around the globe in mature and emerging markets.

1.3.3 The Global Air Transport Market

Worldwide Airport Passenger Traffic

The top 30 global airports by passenger throughput in 2012 have been examined and are shown in Table 1-5 (by passenger volume) and Table 1.6 (by passenger growth) below.

Table 1-5: Top 30 Global Airports by Passengers (millions) in 2012

Rank	Airport	Region	2012	% chg
1	Atlanta (ATL)	N. America	95.51	3.4
2	Beijing (PEK)	Asia Pacific	81.93	4.1
3	London Heathrow (LHR)	Europe (EU)	69.98	0.9
4	Tokyo Haneda (HND)	Asia Pacific	66.78	6.7
5	Chicago (ORD)	N. America	66.62	-0.1
6	Los Angeles (LAX)	N. America	63.69	3.0
7	Paris (CDG)	Europe (EU)	61.49	1.0
8	Dallas /Ft Worth (DFW)	N. America	58.59	1.4
9	Frankfurt (FRA)	Europe (EU)	57.27	1.7
10	Dubai (DXB)	Middle East	57.12	13.8
11	Hong Kong (HKG)	Asia Pacific	55.66	5.5
12	Jakarta (CGK)	Asia Pacific	54.49	12.9
13	Denver (DEN)	N. America	53.16	0.6
14	Bangkok (BKK)	Asia Pacific	51.64	11.5
15	Amsterdam (AMS)	Europe (EU)	50.98	2.6
16	Singapore (SIN)	Asia Pacific	49.91	9.9
17	New York (JFK)	N. America	49.29	3.5
18	Guangzhou (CAN)	Asia Pacific	48.18	7.2
19	Madrid (MAD)	Europe (EU)	45.10	-9.0
20	Istanbul (IST)	Europe (non-EU)	45.09	20.6
21	Shanghai (PVG)	Asia Pacific	44.68	8.3
22	San Francisco (SFO)	N. America	44.32	8.6
23	Charlotte (CLT)	N. America	41.23	5.6
24	Las Vegas (LAS)	N. America	40.80	0.6
25	Phoenix (PHX)	N. America	40.42	-0.4
26	Houston (IAH)	N. America	39.89	-0.6
27	Kuala Lumpur (KUL)	Asia Pacific	39.51	5.9
28	Miami (MIA)	N. America	39.47	3.0
29	Seoul (ICN)	Asia Pacific	38.97	11.1
30	Munich (MUC)	Europe (EU)	38.22	1.5

Source: ACI Worldwide Airport Traffic Report

In terms of passenger volume, North American airports dominate the top 30 in the world with twelve airports recording 633 million passengers; Asia Pacific has ten airports with 532 million passengers; Europe has seven airports with 368 million passengers (the EU has six airports with 323 million passengers); and the Middle East has one airport with 57 million passengers (Dubai).

London Heathrow remains the leading airport in Europe, approaching 70 million annual passengers in 2012. Among Europe's top airports, Madrid continued to fall down the global rankings with a further decline in passengers, while Rome Fiumicino (FCO) dropped out of the World Top 30 altogether, not because of poor growth, but due to the rapid expansion of high performers such as Kuala Lumpur and Seoul in Asia Pacific, and Istanbul Ataturk in Europe.

Table 1.6: Top 30 Global Airports by Passenger Growth (%) in 2012

Rank	Airport	Region	2012	% chg
1	Istanbul (IST)	Europe (non-EU)	45.09	20.6
2	Dubai (DXB)	Middle East	57.12	13.8
3	Jakarta (CGK)	Asia Pacific	54.49	12.9
4	Bangkok (BKK)	Asia Pacific	51.64	11.5
5	Seoul (ICN)	Asia Pacific	38.97	11.1
6	Singapore (SIN)	Asia Pacific	49.91	9.9
7	San Francisco (SFO)	N. America	44.32	8.6
8	Shanghai (PVG)	Asia Pacific	44.68	8.3
9	Guangzhou (CAN)	Asia Pacific	48.18	7.2
10	Tokyo Haneda (HND)	Asia Pacific	66.78	6.7
11	Kuala Lumpur (KUL)	Asia Pacific	39.51	5.9
12	Charlotte (CLT)	N. America	41.23	5.6
13	Hong Kong (HKG)	Asia Pacific	55.66	5.5
14	Beijing (PEK)	Asia Pacific	81.93	4.1
15	New York (JFK)	N. America	49.29	3.5
16	Atlanta (ATL)	N. America	95.51	3.4
17	Miami (MIA)	N. America	39.47	3.0
18	Los Angeles (LAX)	N. America	63.69	3.0
19	Amsterdam (AMS)	Europe (EU)	50.98	2.6
20	Frankfurt (FRA)	Europe (EU)	57.27	1.7
21	Munich (MUC)	Europe (EU)	38.22	1.5
22	Dallas /Ft Worth (DFW)	N. America	58.59	1.4
23	Paris (CDG)	Europe (EU)	61.49	1.0
24	London Heathrow (LHR)	Europe (EU)	69.98	0.9
25	Las Vegas (LAS)	N. America	40.80	0.6
26	Denver (DEN)	N. America	53.16	0.6
27	Chicago (ORD)	N. America	66.62	-0.1
28	Phoenix (PHX)	N. America	40.42	-0.4
29	Houston (IAH)	N. America	39.89	-0.6
30	Madrid (MAD)	Europe (EU)	45.10	-9.0

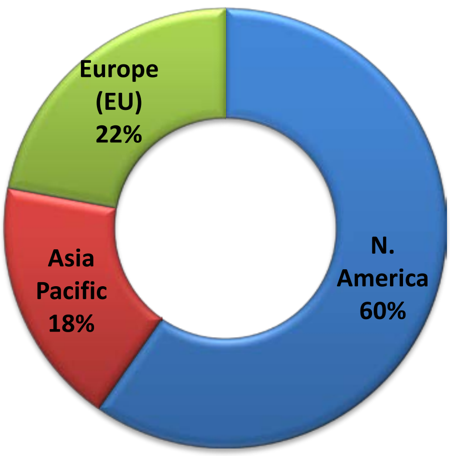
Source: ACI Worldwide Airport Traffic Report

Ranking these airports in terms of growth rates, however, shows that seven out of the top ten are Asia Pacific airports. Six out of the bottom ten airports are North American, reinforcing the trend that we pointed to earlier where a shift in focus has favoured the expansion of Asia Pacific airports. The fastest growing airport in 2012 was Istanbul Ataturk, achieving a phenomenal 20.6% growth on the back of rapidly expanding base carrier Turkish Airlines. In comparison, EU airports experienced sluggish growth in 2012, with Amsterdam (+2.6%) the top performer in the bloc. Madrid (as mentioned above) was the worst performing airport in the World Top 30, attributable in the most part to volatile airline activity – specifically, the effects of Spanair closure and sizeable reductions by easyJet, Vueling, Ryanair and base carrier Iberia – and the Spanish economy in the round supressing demand for air travel.

Historical Growth by World Region

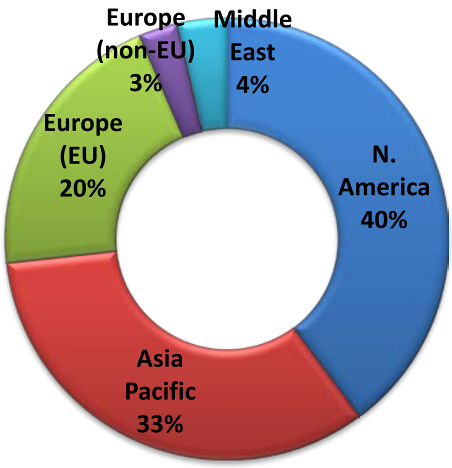
Regional market share has changed markedly from 2005 when North America dominated the top 30 global airports by passenger throughput, accounting for 60%. North America's decline has been Asia Pacific's gain, attaining a 33% market share of the top 30 global airports' passenger throughput in 2012 up from 18% in 2005, pushing past EU airports in the process.

Figure 1.11: Top 30 Global Airports by Passengers & Regional Share 2005



Source: ACI Worldwide Airport Traffic Report

Figure 1.12: Top 30 Global Airports by Passengers & Regional Share 2012



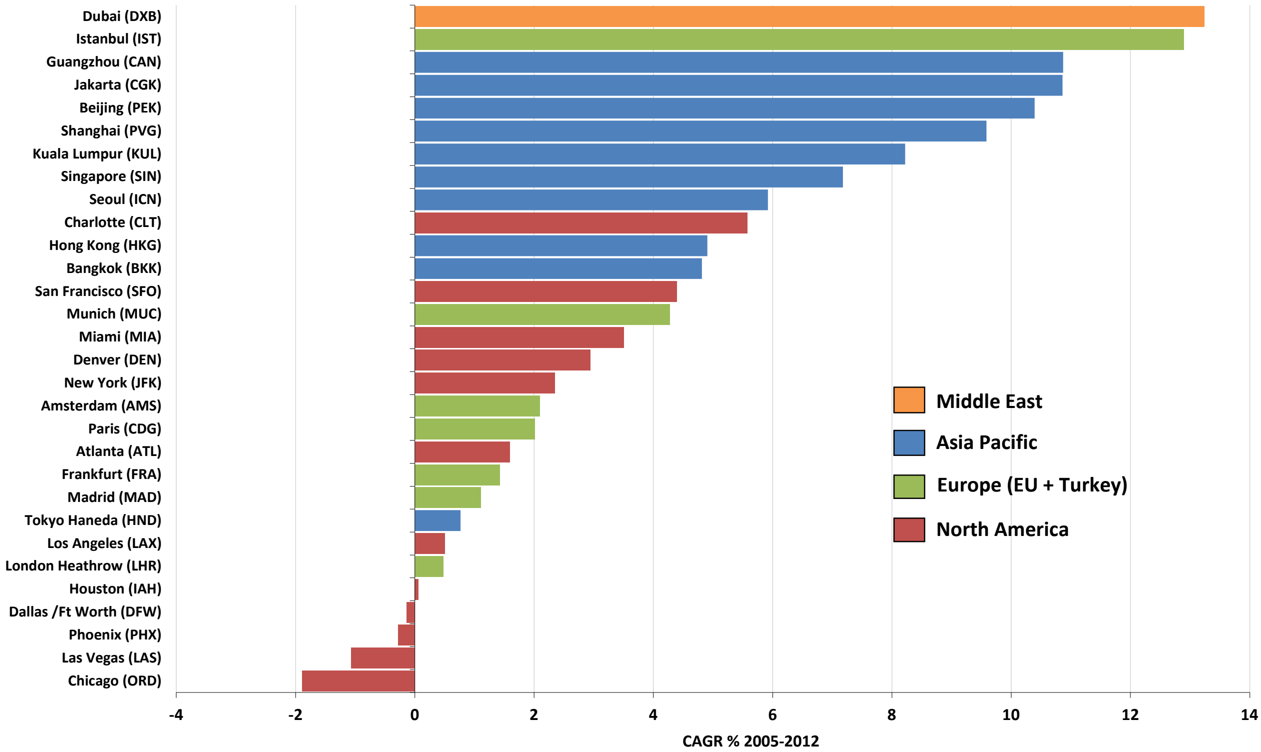
Source: ACI Worldwide Airport Traffic Report

Exploring the passenger growth of the top 30 global airports paints a picture of a changing landscape. Growth in Asia Pacific, and to a lesser extent the Middle East (albeit from a small base), is far outpacing that of the EU and North America. This reflects the maturity of the latter markets but also the continued shift in focus of economic growth to Asia coupled with increasing liberalisation in the region, and an unconstrained operating environment in the Middle East nations.

Historical Growth by Worldwide Airport

Looking at the individual airport detail, we can micro-analyse where growth and decline was focused between 2005 and 2012. The colour-coding in Figure 1.13 opposite allows us to immediately identify the block of blue (Asia Pacific) in the 'high growth' portion of the chart, indicating the rapid expansion experienced in the Asia Pacific region over the last decade. Of the major global airports, only Dubai and Istanbul outside of Asia Pacific have achieved higher average annual growth rates than the top-performing Asia Pacific airports since 2005. At the other end of the spectrum, the four major airports that have recorded declining passenger traffic levels between 2005 and 2012 are located in North America.

Figure 1.13: Top 30 Global Airports – Passenger Growth 2005-2012



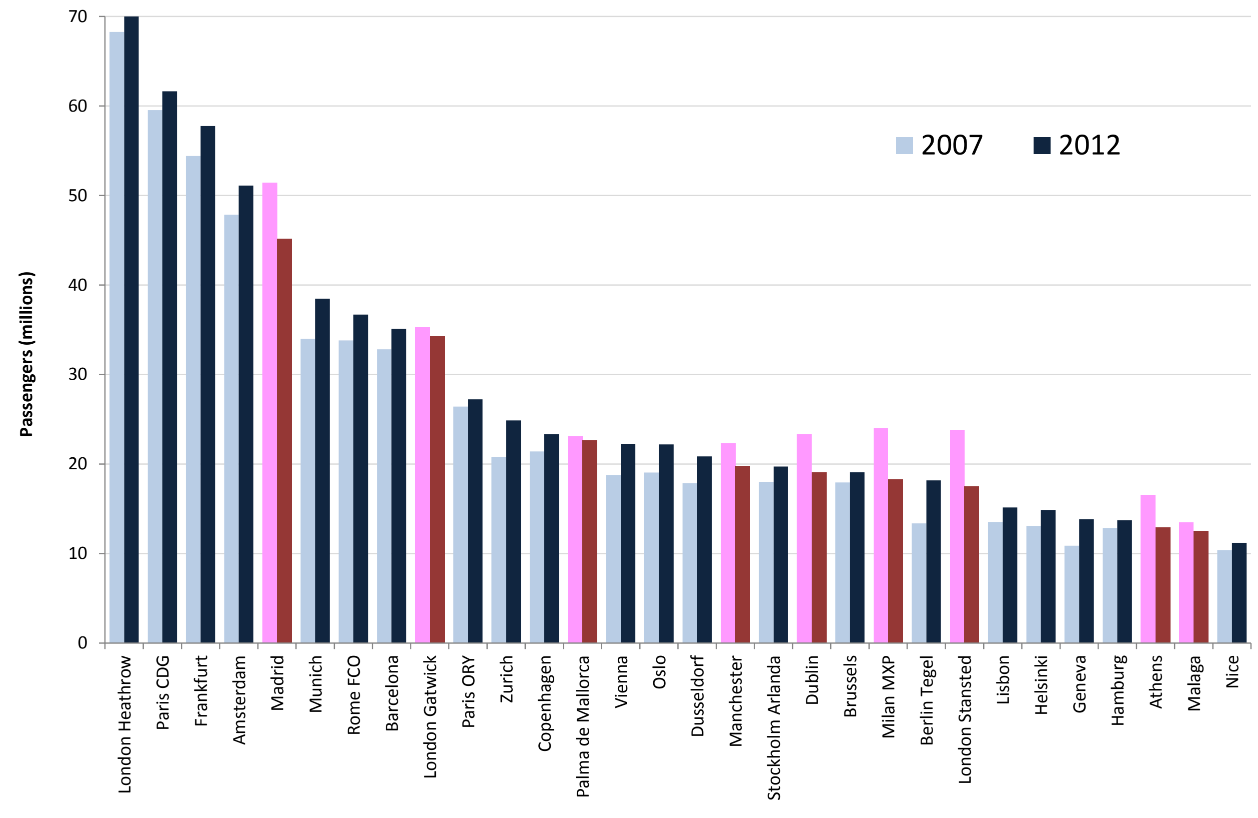
Source: ACI

Historical Growth at Top 30 European Airports

According to Eurostat, of the Top 30 European airports by passenger throughput in 2012, as many as nine have seen declining passenger volumes since 2007 (Figure 1.14). Madrid Barajas, Spain's premier hub airport, is the most significant of these. It has previously been mentioned in this report that Madrid has slipped down the global airport rankings, but has largely maintained its position as one of Europe's leading airports, only ceding fourth place in the European rankings to Amsterdam in the last five years. This coincides with the general precariousness of Spain's economy, which has impacted upon flag carrier and base airline Iberia's fortunes.

Also of significance is the fact that three of the UK's top airports – London Gatwick, Manchester and London Stansted – have all lost passenger traffic relative to 2007 levels. The most dramatic of these is Stansted, declining at an average annual rate of 6% between 2007 and 2012. The London airport serves mainly leisure air travel demand, and it is this segment that has been impacted hardest by the austerity measures in the UK economy hitting prospective holiday travellers in the pocket.

Figure 1.14: Top 30 European (ECAA) Airports by passengers in 2012 compared with 2007



Source: Eurostat (ACI 2012 figures for Rome FCO & Milan MXP)

It is a similar story at Milan Malpensa, which has experienced the second worst decline in the European Top 30, behind Stansted. Both airports have an over-reliance on LCCs to grow their traffic base. LCC passengers are more sensitive to price and liable to seek cheaper destinations or forego air travel altogether, meaning this section of the market is very sensitive to cuts in disposable income resulting from the recent depressed economic environment in, in this case, Italy and the UK.

Despite the highly visible declines, there are plenty of instances of success at the top European airports. Throughout the ongoing economic depression that began in 2008, the European major airports have largely weathered the storm with eight of the top ten recording growth since 2007. The best performer in the Top 30 is Berlin Tegel (6.3% CAGR 2007-2012), increasing its international presence during this time period.

Table 1-7: Top 30 European (ECAA) Airports by Passengers – Historical Growth (millions)

Rank	Airport	Country	2007	2012	CAGR % 2007-2012
1	London Heathrow	United Kingdom	68.3	70.1	0.5%
2	Paris CDG	France	59.5	61.6	0.7%
3	Frankfurt	Germany	54.4	57.8	1.2%
4	Amsterdam	Netherlands	47.8	51.1	1.3%
5	Madrid	Spain	51.4	45.2	-2.5%
6	Munich	Germany	34.0	38.5	2.5%
7	Rome FCO	Italy	33.8	36.7	1.7%
8	Barcelona	Spain	32.8	35.1	1.4%
9	London Gatwick	United Kingdom	35.3	34.2	-0.6%
10	Paris ORY	France	26.4	27.2	0.6%
11	Zurich	Switzerland	20.8	24.9	3.6%
12	Copenhagen	Denmark	21.4	23.3	1.7%
13	Palma de Mallorca	Spain	23.1	22.6	-0.4%
14	Vienna	Austria	18.8	22.3	3.5%
15	Oslo	Norway	19.0	22.2	3.1%
16	Dusseldorf	Germany	17.9	20.8	3.2%
17	Manchester	United Kingdom	22.3	19.8	-2.4%
18	Stockholm Arlanda	Sweden	18.0	19.7	1.8%
19	Dublin	Ireland	23.3	19.1	-3.9%
20	Brussels	Belgium	17.9	19.1	1.2%
21	Milan MXP	Italy	24.0	18.3	-5.3%
22	Berlin Tegel	Germany	13.4	18.2	6.3%
23	London Stansted	United Kingdom	23.8	17.5	-6.0%
24	Lisbon	Portugal	13.5	15.1	2.3%
25	Helsinki	Finland	13.1	14.9	2.6%
26	Geneva	Switzerland	10.9	13.8	4.9%
27	Hamburg	Germany	12.9	13.7	1.3%
28	Athens	Greece	16.5	12.9	-4.8%
29	Malaga	Spain	13.5	12.5	-1.4%
30	Nice	France	10.4	11.2	1.5%

Source: Eurostat (ACI 2012 figures for Rome FCO & Milan MXP)

Outside of Europe and competing against EU airports, among the most successful airports in the last five years in terms of passenger traffic growth are Turkish and Russian, for different reasons. Russia has been very active in expanding bilateral air service agreements to cope with the surge in outbound air travel demand created by the Russian population's increasing propensity to fly. This is shown in Table 1.8, where the two main Moscow airports' traffic growth since 2007 has been exceptional, and St Petersburg has nearly doubled its size.

Table 1.8: Major Competitor airports outside ECAA

Airport	Country	2007	2012	CAGR % 2007-2012
Istanbul IST	Turkey	25.6	45.1	12.0%
Moscow DME	Russia	18.8	28.2	8.5%
Moscow SVO	Russia	14.0	26.2	13.3%
Antalya AYT	Turkey	17.8	25.1	7.1%
Istanbul SAW	Turkey	3.8	14.4	30.6%
St Petersburg LED	Russia	6.1	11.2	12.7%

Source: ACI Worldwide Airport Traffic Report

With reference to Turkey, the country has also witnessed significant economic growth reflected in Istanbul's pre-eminence as a business hub in the region, with Atatürk Airport growing as a result of Turkish Airlines' rapid expansion and evolution into a leading carrier. Istanbul's Sabiha Gökçen airport has undergone rapid expansion in the last five years as a low-cost alternative to Atatürk. Antalya has benefited from its ability to attract increasing volumes of visitors, being a prominent destination for international tourism.

1.3.4 Trends in Average Passengers per ATM

The nature and role of an airport dictates the aircraft mix and thus the level of average number of passengers per air transport movement (ATM) it is likely to achieve – whether it is an international gateway, domestic hub, point-to-point or regional airport.

Where airports are runway-capacity constrained, passenger throughput can be grown by increasing the average passengers per air transport movement. By altering the aircraft mix at an airport to include a greater proportion of high seat density widebodies, for example, an airport's passenger volume can grow without significantly increasing the number of movements.

However, this is not a panacea for capacity constrained major hub airports, as there are commercial limitations on the optimum mix of aircraft by the nature of the way a hub airport needs short-haul connecting services to feed long-haul routes. Increasing the average number of passengers per movement by introducing larger aircraft at an airport cannot happen indefinitely – there is a threshold.

To investigate this further, the evolution of average passengers per ATM at the Top 30 global airports, ranked by passenger volume in 2012, has been analysed in Table 1-9 below.

Table 1-9: Top 30 Global Airports Ranked by Passenger Volume (in 2012) – Passengers per ATM evolution

Rank	Airport Name	2007	2008	2009	2010	2011	2012	Diff. '12 vs '07	% chg '12 vs '11
1	Atlanta (ATL)	90	93	91	124	101	104	13	2.8
2	Beijing (PEK)	134	130	134	143	148	147	13	-0.3
3	London Heathrow (LHR)	143	141	143	146	146	148	6	1.9
4	Tokyo Haneda (HND)	201	197	184	187	165	171	-31	3.6
5	Chicago (ORD)	84	80	79	78	78	78	-6	0.2
6	Los Angeles (LAX)	101	102	107	108	108	111	10	2.6
7	Paris (CDG)	110	110	112	118	120	125	15	4.1

Rank	Airport Name	2007	2008	2009	2010	2011	2012	Diff. '12 vs '07	% chg '12 vs '11
8	Dallas /Ft Worth (DFW)	88	88	119	121	90	91	3	0.9
9	Frankfurt (FRA)	111	111	111	115	117	120	10	2.9
10	Dubai (DXB)	145	152	156	165	167	178	33	6.8
11	Hong Kong (HKG)	160	159	164	166	162	163	3	0.4
12	Jakarta (CGK)	124	123	130	138	140	143	20	2.6
13	Denver (DEN)	82	83	83	83	85	87	5	3.3
14	Bangkok (BKK)	151	151	154	155	155	164	13	6.3
15	Amsterdam (AMS)	110	111	111	117	118	120	11	1.8
16	Singapore (SIN)	160	156	150	155	151	154	-6	2.1
17	New York (JFK)	109	110	112	119	118	126	16	6.4
18	Guangzhou (CAN)	118	119	120	125	129	130	11	0.3
19	Madrid (MAD)	107	108	110	115	116	121	14	4.7
20	Istanbul (IST)	95	112	112	117	124	130	35	5.1
21	Shanghai (PVG)	115	107	112	123	121	125	9	2.9
22	San Francisco (SFO)	105	106	106	110	110	113	8	2.7
23	Charlotte (CLT)	68	69	71	116	118	120	52	1.5
24	Las Vegas (LAS)	86	82	86	107	103	105	19	2.0
25	Phoenix (PHX)	85	85	87	91	92	95	10	2.7
26	Houston (IAH)	74	75	76	79	79	81	7	2.4
27	Kuala Lumpur (KUL)	136	130	131	138	139	140	4	0.6
28	Miami (MIA)	88	92	98	96	98	102	14	3.5
29	Seoul (ICN)	148	142	144	156	153	153	6	0.4
30	Munich (MUC)	83	84	87	94	97	101	18	4.6

Source: ACI Worldwide Airport Traffic Report

The figures would suggest that London Heathrow – the busiest international airport in the world – has reached its threshold in average number of passengers per ATM. Between 2007 and 2012, passengers per movement remained broadly at the same level at the UK's premier airport. In order to run a successful hub operation at Heathrow, there is an optimum balance of short-haul versus long-haul traffic – too many long-haul flights (thus larger aircraft) will not allow sufficient short-haul feeder traffic. At other major EU hubs like Paris CDG, Amsterdam, Frankfurt and Madrid, runway capacity and the availability of slots are less of an issue; so there is more opportunity to accommodate growth of both short-haul and long-haul flights compared to Heathrow, meaning average aircraft size can be increased without compromising the effective 'hub and spoke' operation. This is borne out by the respective higher growth in average passengers per ATM of the major EU airports, compared to Heathrow.

The fast-growing major airports in the Asia Pacific region, such as Beijing, Jakarta, Bangkok and Guangzhou, have also experienced rapid growth in average aircraft size, reflecting the evolving nature of these airports from regional hubs to international hubs, and the expansion of long-haul route networks utilising larger aircraft. Dubai in the Middle East and Istanbul in Europe have grown for ostensibly the same reasons, with base carriers Emirates and Turkish Airlines, respectively, expanding rapidly into international markets with widebody operations.

1.4 Airline Passenger Traffic

1.4.1 Growth of Passenger Traffic in 2012

Due to data availability on airline traffic, this section addresses trends in airline traffic growth rather than reporting on absolute numbers. IATA reported that in 2012 its member airlines recorded an increase in demand for scheduled air passenger traffic (RPKs) of 5.3%, slower than the 6.9% achieved in 2011. However, capacity growth (ASKs) in 2012 was far below that of RPKs, at 3.9%. In all world regions, passenger growth outstripped that of capacity growth (as shown in Table 1-10). This contributed to pushing total market Passenger Load Factors up one percentage point to 79.1% in 2012, from 78.1% in 2011.

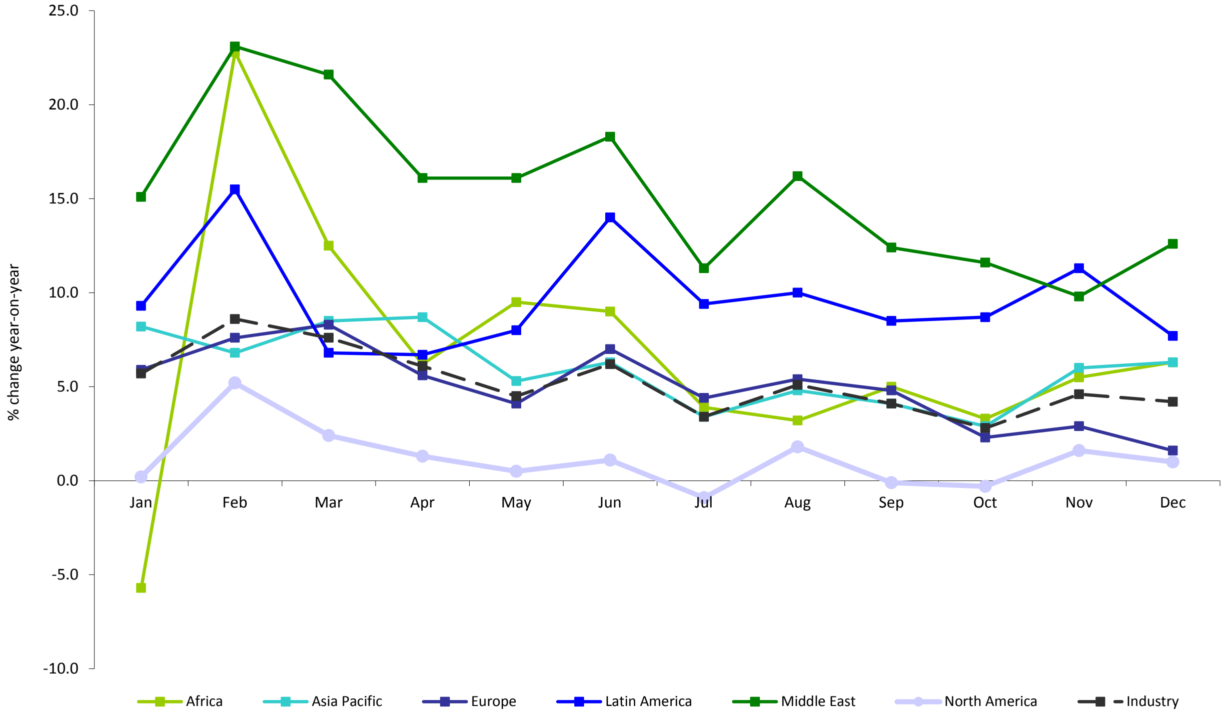
Table 1-10: Summary of Air Passenger Traffic growth by Region in 2012 vs. 2011

	Africa	Asia Pacific	Europe	Latin America	Middle East	North America	Industry
Revenue Passenger Kilometres (RPK)	7.2%	6.0%	5.1%	9.5%	15.2%	1.1%	5.3%
Available Seat Kilometres (ASK)	6.5%	5.2%	2.9%	7.5%	12.4%	0.1%	3.9%

Source: IATA

Figure 1.15 shows year-on-year growth in IATA member airline RPKs by month of 2012, by global region. The trends are similar to those expressed in Figure 1.2 (airport passenger throughput growth). The high growth rates for African and Middle Eastern airlines at the start of the year are mostly due to the distorting impact of the 'Arab Spring' a year earlier. Similarly, the upturn in growth in March for the Asia Pacific region is mostly attributable to the Japanese earthquake hitting growth in March 2011.

Figure 1.15: Revenue Passenger Kilometre (RPK) growth of IATA Airlines by Region 2012 vs. 2011



Source: IATA

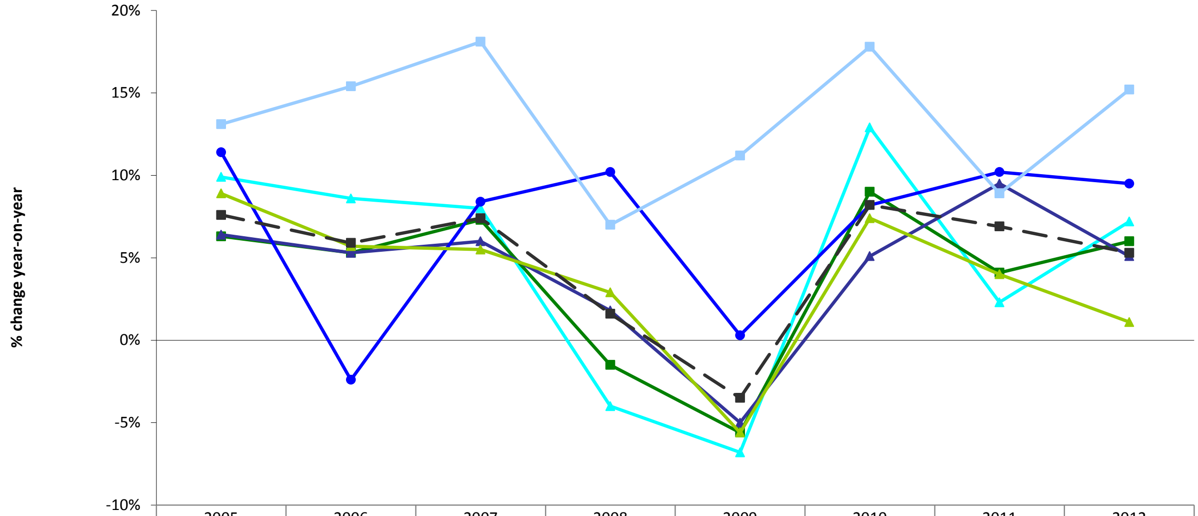
For European airlines, RPK growth slowed as 2012 progressed, and annual growth of 5.1% was slightly behind the total market average (5.3%). Capacity growth in Europe was also lower than the industry average, at 2.9% (compared to 3.9%). Passenger Load Factors (PLF) increased considerably over 2011 levels, with IATA's European members achieving PLFs of 79.6% in 2012, up from 78.0% a year earlier.

Middle Eastern carriers saw the highest growth in RPKs (15.2%) and ASKs (12.4%) across 2012, continuing the rapid expansion of its major carriers. PLFs rose to 77.5%, up two percentage points over 2011. Traffic growth of Asia Pacific carriers rose to 6.0% in 2012, while capacity growth of 5.2% in the region was above the industry average. As the difference between capacity and passenger growth was fairly small, the resultant PLFs achieved by Asia Pacific airlines was up only 0.7 percentage points over 2011 (77.5% versus 76.8%). North American carriers recorded the lowest growth in passenger traffic (1.1%) and capacity (0.1%), far below the industry averages in 2012. However, PLFs in the region remain the highest in the industry, at 82.9%, up from 82.1% the previous year.

Latin American carriers sustained high growth rates (9.5% RPKs; 7.5% ASKs) in 2012, albeit from a lower base than most regions. In line with the rest of the world, IATA's Latin American members recorded an upswing in PLFs in 2012, to reach 76.1%, up from 74.6% in 2011. African carriers experienced reasonable traffic growth in 2012 (7.2%), while capacity was also added at a solid rate (6.5%). However, with PLFs across the region remaining the lowest of all regions (67.7%) in 2012, further capacity discipline is required to boost PLFs that have stagnated (67.6% in 2011).

1.4.2 Historical Growth in Passenger Traffic

Figure 1.16: Historical RPKs by Region



	2005	2006	2007	2008	2009	2010	2011	2012
Africa	9.9%	8.6%	8.0%	-4.0%	-6.8%	12.9%	2.3%	7.2%
Asia/Pacific	6.3%	5.3%	7.3%	-1.5%	-5.6%	9.0%	4.1%	6.0%
Europe	6.4%	5.3%	6.0%	1.8%	-5.0%	5.1%	9.5%	5.1%
Latin America	11.4%	-2.4%	8.4%	10.2%	0.3%	8.2%	10.2%	9.5%
Middle East	13.1%	15.4%	18.1%	7.0%	11.2%	17.8%	8.9%	15.2%
North America	8.9%	5.7%	5.5%	2.9%	-5.6%	7.4%	4.0%	1.1%
Industry	7.6%	5.9%	7.4%	1.6%	-3.5%	8.2%	6.9%	5.3%

Source: IATA

Figure 1.16 shows that since 2005, in broad terms, Middle Eastern airlines have been growing at the fastest pace followed by Latin American carriers (barring an exceptional decline in 2006). The growth of European, North American and Asia Pacific airlines have been fairly closely aligned, experiencing similar demand peaks and troughs over the period from 2005 to 2012.

1.4.3 The Top 30 Major Airlines Worldwide

From an analysis of 2012 traffic statistics of major global airlines from across the world, a trend emerges that recognises the shift in focus of air travel demand growth away from the mature markets towards the emerging expanding markets. The Top 30 airlines have been ranked according to RPK volume and RPK growth in Table 1-11.

Table 1-11: Top 30 Global Airlines by Passenger Traffic (RPKs) and Growth in 2012 (billion)

Rank	Airline	Region	RPKs (billions)	% chg
1	Delta Air Lines	North America	310.5	0.1
2	United Airlines	North America	288.7	-1.3
3	American Airlines	North America	203.3	-0.1
4	Emirates	Middle East	188.6	17.6
5	Southwest Airlines	North America	165.7	-1.0
6	Lufthansa	Europe (EU)	149.8	1.3
7	Air France	Europe (EU)	135.8	2.1
8	British Airways	Europe (EU)	126.4	7.7
9	China Eastern Airlines	Asia Pacific	109.1	8.1
10	China Southern Airlines	Asia Pacific	107.0	5.3
11	US Airways	North America	100.5	2.7
12	Ryanair	Europe (EU)	100.0	6.1
13	Air China	Asia Pacific	95.9	3.0
14	Cathay Pacific	Asia Pacific	94.2	2.4
15	Singapore Airlines	Asia Pacific	93.8	6.8
16	Air Canada	North America	89.5	2.6
17	KLM	Europe (EU)	86.3	2.5
18	Qantas	Asia Pacific	75.9	0.3
19	Turkish Airlines	Europe (non-EU)	74.6	26.6
20	Qatar Airways	Middle East	73.6	13.7
21	Korean Air	Asia Pacific	68.8	6.1
22	easyJet	Europe (EU)	65.2	6.3
23	All Nippon Airways	Asia Pacific	62.5	4.3
24	Thai Airways	Asia Pacific	60.7	9.8
25	TAM Linhas Aereas	Latin America	59.1	4.3
26	jetBlue	North America	54.0	9.3
27	Aeroflot	Europe (non-EU)	50.5	20.3
28	Iberia	Europe (EU)	49.7	-3.1
29	Air Berlin	Europe (EU)	48.7	-6.6
30	Etihad Airways	Middle East	48.0	23.1

Airline	Region	% chg
Turkish Airlines	Europe (non-EU)	26.6
Etihad Airways	Middle East	23.1
Aeroflot	Europe (non-EU)	20.3
Emirates	Middle East	17.6
Qatar Airways	Middle East	13.7
Thai Airways	Asia Pacific	9.8
jetBlue	North America	9.3
China Eastern Airlines	Asia Pacific	8.1
British Airways	Europe (EU)	7.7
Singapore Airlines	Asia Pacific	6.8
easyJet	Europe (EU)	6.3
Ryanair	Europe (EU)	6.1
Korean Air	Asia Pacific	6.1
China Southern Airlines	Asia Pacific	5.3
All Nippon Airways	Asia Pacific	4.3
TAM Linhas Aereas	Latin America	4.3
Air China	Asia Pacific	3.0
US Airways	North America	2.7
Air Canada	North America	2.6
KLM	Europe (EU)	2.5
Cathay Pacific	Asia Pacific	2.4
Air France	Europe (EU)	2.1
Lufthansa	Europe (EU)	1.3
Qantas	Asia Pacific	0.3
Delta Air Lines	North America	0.1
American Airlines	North America	-0.1
Southwest Airlines	North America	-1.0
United Airlines	North America	-1.3
Iberia	Europe (EU)	-3.1
Air Berlin	Europe (EU)	-6.6

Source: Airline Business August 2013 edition (Left hand table ranked by RPK, right hand table by growth)

Although four of the top five airlines in the ranking by RPK volume are North American, that same group of airlines resides in the bottom six in terms of growth. Once again, the stand-out performer at the top end of the rankings – ranked fourth by both volume and growth – is Middle Eastern carrier, Emirates (18% RPK growth in 2012 versus 2011), which continues to close the gap on the top carriers to be considered a truly major player in the global airline scene. Fellow Middle Eastern network carriers Qatar Airways and Etihad Airways also posted impressive growth of 14% and 23% in 2012, respectively.

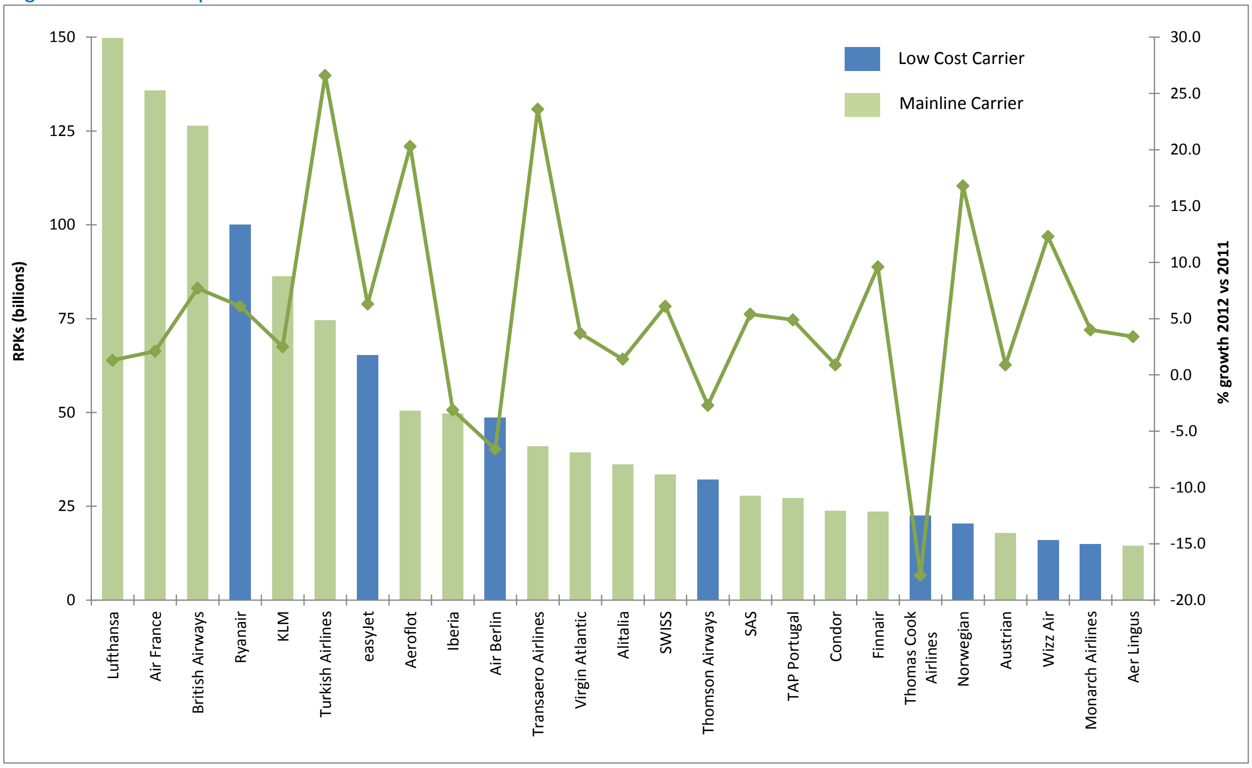
The European majors posted a mixed bag of traffic results, with Lufthansa and Air France recording solid but fairly flat growth, and British Airways outperforming the rest of the EU majors with almost 8% RPK growth over 2011. The worst-performing airline in the Top 30 was Air Berlin (-7%), reflecting its struggle to maintain market position and correct its financial problems. In wider Europe, both Turkish Airlines (27%) and Aeroflot (20%) achieved impressive passenger growth on the back of strong home markets.

Europe – Major Airlines Growth in 2012

In terms of growth, the major European carriers presented a largely positive story in 2012. The big three network carriers in the region (Air France-KLM, Lufthansa and British Airways) recorded solid growth, while the region’s foremost LCC, Ryanair, continued its inexorable expansion. The only declines in the top ten lay with Iberia and Air Berlin.

A familiar trend reappears with growth of Russian and Turkish operators outstripping the traditional legacy carriers in Europe, with Turkish Airlines, Transaero and Aeroflot achieving 26%, 24% and 20% growth respectively in 2012. Norwegian Air Shuttle again recorded impressive growth of 17% in 2012, following 25% and 30% growth in 2011 and 2010 respectively.

Figure 1.17: European Airlines RPK Growth in 2012

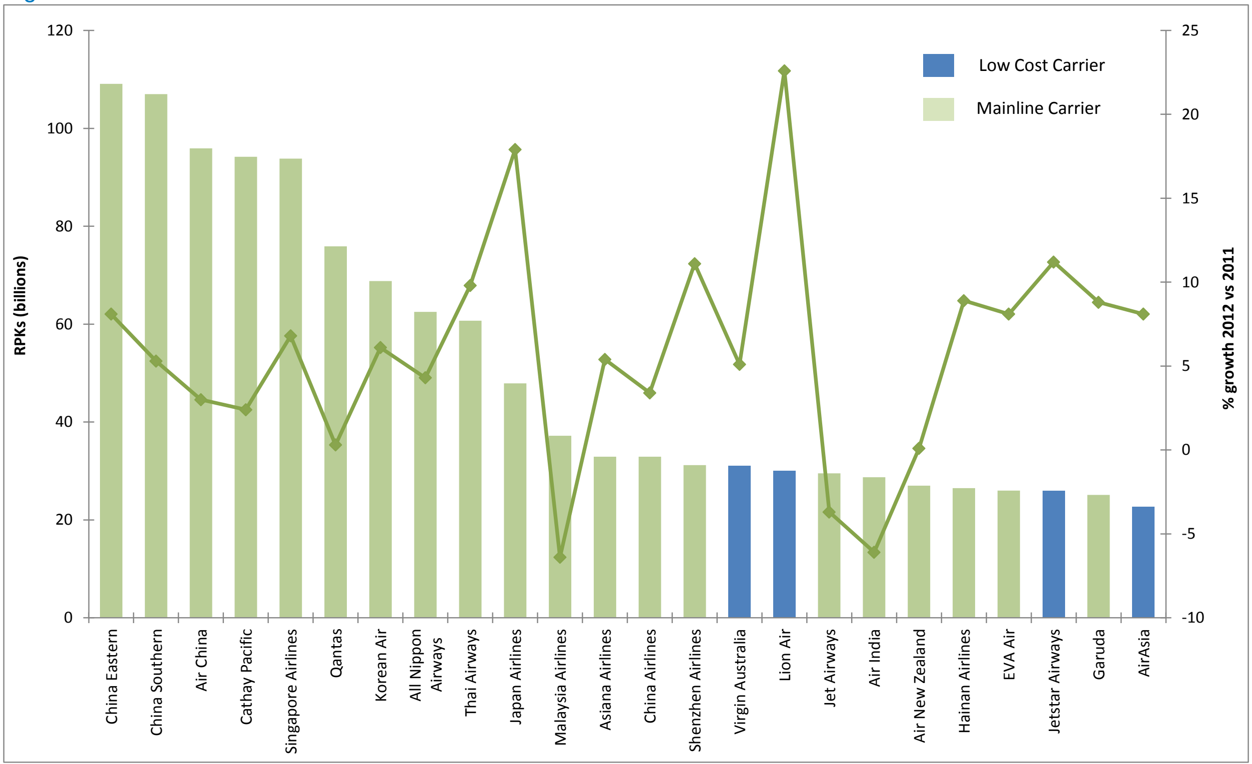


Source: Airline Business August 2013 edition

Asia Pacific – Major Airlines Growth in 2012

The top three Asia Pacific mainline carriers in terms of RPK volumes in 2012 are based in China, reinforcing the position of China as the premier air transport market in the Asia Pacific region. However, growth has started to slow down from the exceptional pace of previous years, in line with a cooling down (albeit relative) in economic growth of China. Low Cost Carriers are an emerging force in this region, and it is expected that the likes of Lion Air and AirAsia, competing in their expanding home markets, will continue to benefit from the rapidly growing demand for air travel in Indonesia and Malaysia in particular.

Figure 1.18: Asia Pacific Airlines RPK Growth in 2012



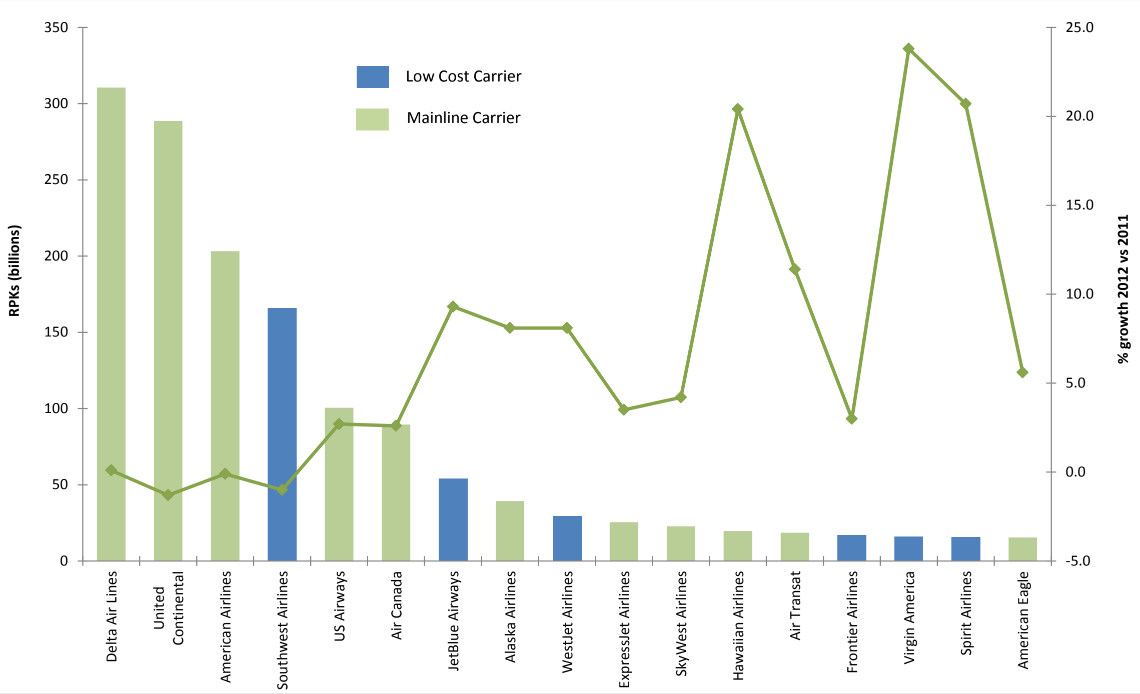
Source: Airline Business August 2013 edition

North America – Major Airlines Growth in 2012

In North America, the US majors are on a different level to most of the other region's mainline carriers in terms of passenger traffic (RPKs).

Of the top five major airlines in terms of RPKs, three recorded passenger declines in 2012 (United-Continental -1.3%; American Airlines -0.1%; Southwest Airlines -1.0%) – at the top of the rankings, Delta remained flat. Further down the rankings, however, the majority of North American carriers experienced either robust or impressive growth in traffic. Focussing on the low cost sector in the region, although Southwest Airlines had a rare poor performance in 2012, jetBlue Airways (9.3%), Westjet Airlines (8.1%), Virgin America (23.8%) and Spirit Airlines (20.7%) all posted sterling traffic growth, signalling a recovery in leisure markets in North America – jetBlue, for instance, earmarked its San Juan (Puerto Rico) base as a cornerstone for expansion in the Caribbean market.

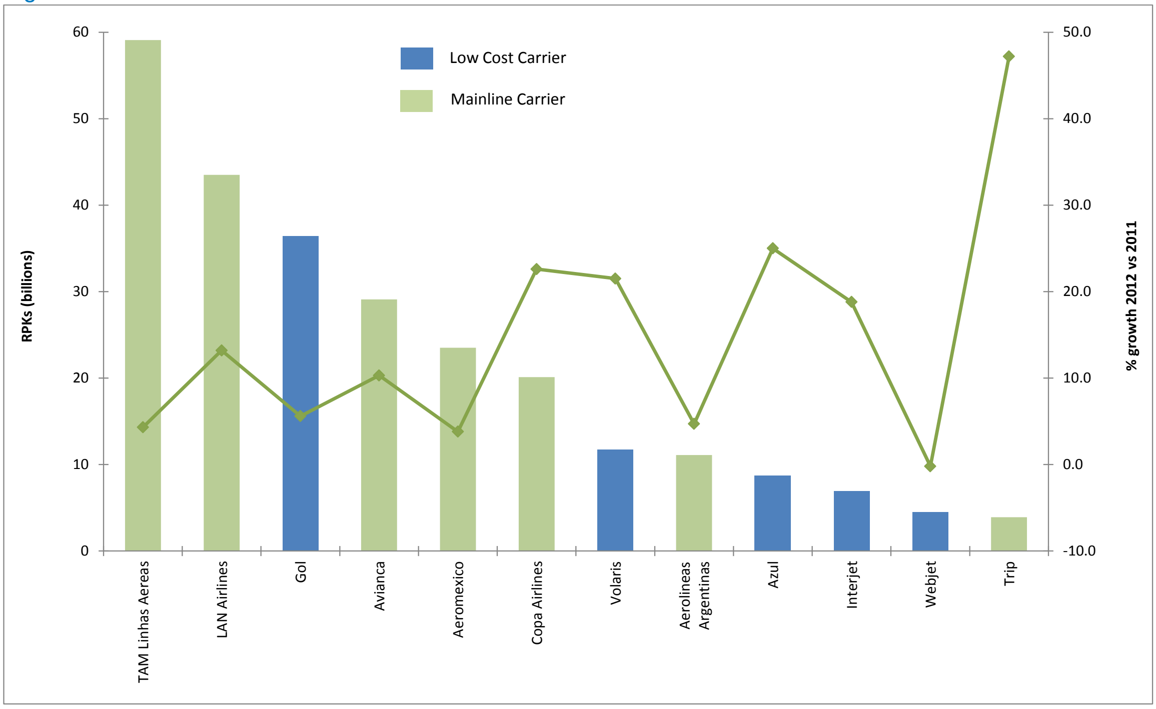
Figure 1.19: North American Airlines RPK Growth in 2012



Source: Airline Business August 2013 edition

Latin America – Major Airlines Growth in 2012

Figure 1.20: Latin American Airline RPK Growth in 2012



Source: Airline Business August 2013 edition

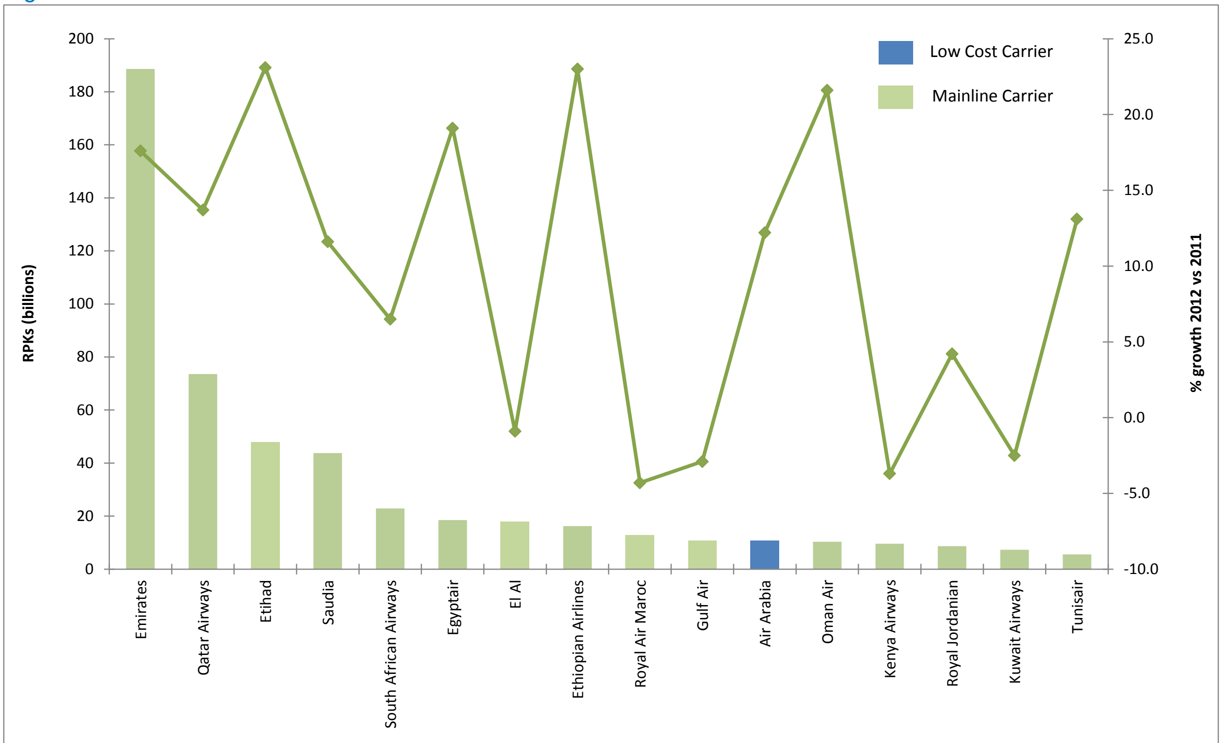
Brazilian mainline operator TAM, and Chilean airline LAN, merged in 2012 creating a new mega-carrier in Latin America. The new entity is called LATAM airlines, but for much of 2012 the two carriers operated under separate certificates, with bases across the continent at São Paulo, Santiago, Lima and Bogotá. Of interest are the two major players in the Brazilian domestic market – TAM (4.3%) and Gol (5.6%) – and their solid but unspectacular traffic growth in 2012, reflecting a slowing down in the rate of expansion of the domestic economy. LCC's Azul (25%) and Webjet (-0.2%), and regional airline Trip (47.2%) also compete in the Brazilian domestic market, with differing fortunes in 2012.

In Mexico, the two LCC's of Volaris (21.5%) and Interjet (18.8%) compete to gain market share from the premier Mexican carrier, Aeromexico (3.8%), with both LCC's achieving far greater growth in traffic in 2012 than the network carrier.

Middle East and Africa – Major Airlines Growth in 2012

In the Middle East, Dubai-based Emirates is the premier airline by some distance, and continued to grow at a phenomenal pace in 2012 (17.6%). Fellow Gulf carriers Qatar Airways (13.7%) and Etihad (23.1%) also continued their aggressive expansion. Certain airlines in the Middle East / Africa region (particularly North African region) have benefitted from an upsurge in traffic compared to a very depressed base in 2011, when the full impacts of the 'Arab Spring' were being felt on airline passenger volumes – carriers including Egyptair (19.1%) and Tunisair (13.1%).

Figure 1.21: Middle East and African Airline RPK Growth in 2012



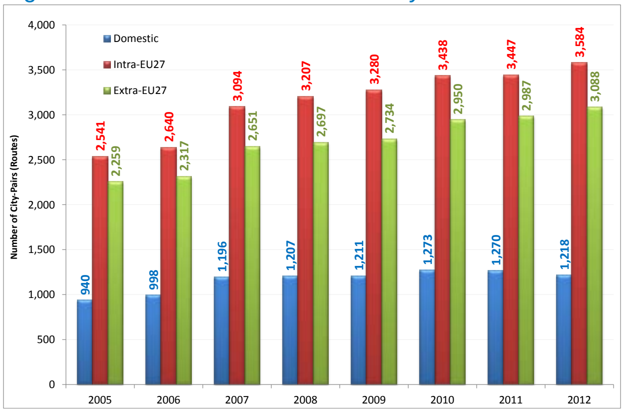
Source: Airline Business August 2013 edition

1.5 European Union (EU27) Route Competition

The level of competition on routes served from European Union (EU27) airports has evolved over recent history. An analysis of OAG airline schedule data for EU airports, for the years 2005 to 2012 on Domestic, Intra-EU and Extra-EU routes, reveals differences by market in the number of carriers operating routes. For this analysis a route is defined as a service between two cities (a city pair).

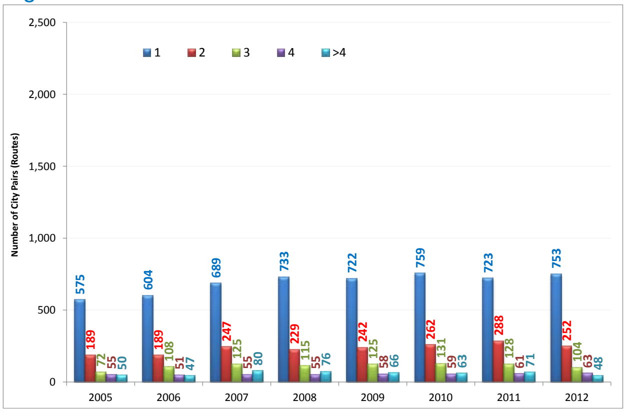
For context, Figure 1.22 shows that growth in the total number of routes served from EU airports has varied by market between 2005 and 2012. Overall, the total number of Domestic routes increased at an average annual rate of 3.8%, while Intra-EU and Extra-EU routes outpaced this, growing 5.0% and 4.6% respectively. However, in 2012, the total number of Domestic routes within the EU declined year-on-year while the Intra-EU and Extra-EU markets both grew. The increased competition with surface transport modes (particularly high speed rail) across Europe could explain the decline in air travel demand on some shorter distance Domestic routes, as well as a general dampening of business air travel demand that impacted upon Domestic markets more than International markets.

Figure 1.22: Total number of routes by market



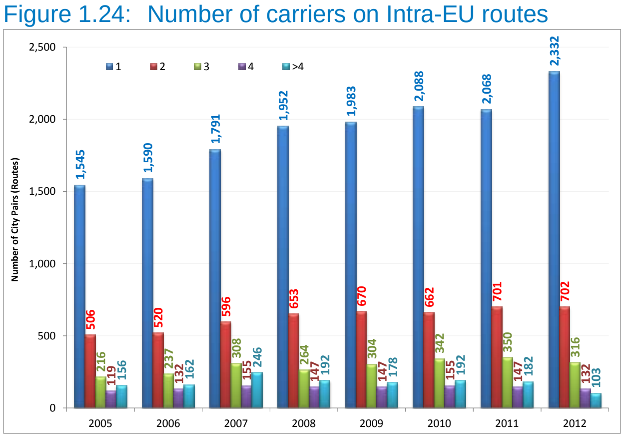
Source: OAG

Figure 1.23: Number of carriers on Domestic routes



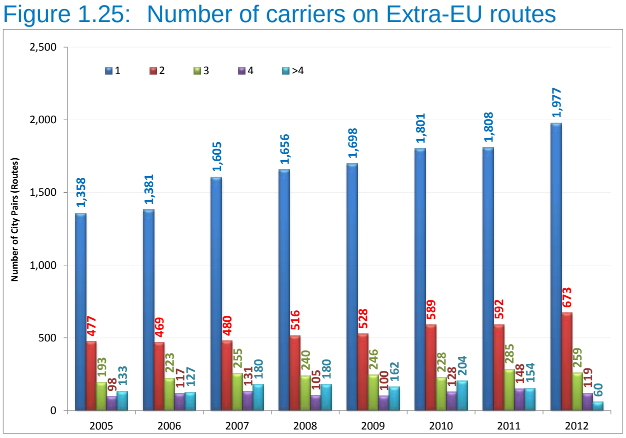
Source: OAG

Figure 1.24: Number of carriers on Intra-EU routes



Source: OAG

Figure 1.25: Number of carriers on Extra-EU routes



Source: OAG

Focussing on competition, Figure 1.23, Figure 1.24 and Figure 1.25 show the number of carriers operating on routes by market. Across all markets, the level of routes with a sole operator in service far outweighs the number of routes where competition exists. Indeed, these routes account for around 60% of the total across Domestic, Intra-EU and Extra-EU markets, and have remained around this mark between 2005 and 2012. Actual growth in number of routes with a sole operator has been high in each of the markets since 2005. Although a ‘flattening’ trend can be seen in the latter years, reflecting adverse economic conditions dampening overall demand for air travel in Europe in general, an upturn in fortunes for 2012 signals the broader recovery in the European air transport market highlighted in earlier subsections.

In general, growth in the number of routes with a sole operator can be attributed to the amount of ‘thin’ routes linking smaller markets inside and outside of the expanding European Union where demand can only support the operation of one airline.

Table 1.12, Table 1.13 and Table 1.14 highlight the share of routes with one carrier, duopoly and oligopoly routes of the total in the three separate markets – Domestic, Intra-EU and Extra-EU.

Table 1.12: Competition on Domestic routes at EU27 airports - % market share

No. of Carriers	2005	2006	2007	2008	2009	2010	2011	2012	CAGR %
1	61.1	60.5	57.6	60.7	59.6	59.6	56.9	61.8	3.9%
2	20.1	18.9	20.7	18.9	20.0	20.6	22.7	20.6	4.2%
3	7.6	10.8	10.5	9.5	10.3	10.3	10.0	8.5	5.4%
4	5.9	5.1	4.6	4.5	4.8	4.6	4.8	5.1	2.0%
>4	5.3	4.7	6.7	6.3	5.4	4.9	5.6	4.0	-0.6%
≤2	81.2	79.4	78.3	79.7	79.6	80.2	79.6	82.4	4.0%
≥3	18.8	20.6	21.7	20.3	20.4	19.8	20.4	17.6	2.8%

Table 1.13: Competition on Intra-EU27 routes at EU27 airports - % market share

No. of Carriers	2005	2006	2007	2008	2009	2010	2011	2012	CAGR %
1	60.8	60.2	57.9	60.9	60.4	60.7	60.0	65.0	6.1%
2	19.9	19.7	19.2	20.3	20.4	19.3	20.3	19.6	4.8%
3	8.5	9.0	9.9	8.2	9.3	9.9	10.1	8.8	5.6%
4	4.7	5.0	5.0	4.6	4.5	4.5	4.3	3.7	1.5%
>4	6.1	6.1	8.0	6.0	5.4	5.6	5.3	2.9	-5.8%
≤2	80.7	79.9	77.1	81.2	80.9	80.0	80.3	84.6	5.8%
≥3	19.3	20.1	22.9	18.8	19.1	20.0	19.7	15.4	1.7%

Table 1.14: Competition on Extra-EU27 routes at EU27 airports - % market share

No. of Carriers	2005	2006	2007	2008	2009	2010	2011	2012	CAGR %
1	60.1	59.6	60.5	61.4	62.1	61.1	60.5	64.0	5.5%
2	21.1	20.2	18.1	19.1	19.3	20.0	19.8	21.8	5.0%
3	8.5	9.6	9.6	8.9	9.0	7.7	9.5	8.4	4.3%
4	4.3	5.0	4.9	3.9	3.7	4.3	5.0	3.9	2.8%
>4	5.9	5.5	6.8	6.7	5.9	6.9	5.2	1.9	-10.7%
≤2	81.2	79.8	78.6	80.5	81.4	81.0	80.3	85.8	5.4%
≥3	18.8	20.2	21.4	19.5	18.6	19.0	19.7	14.2	0.5%

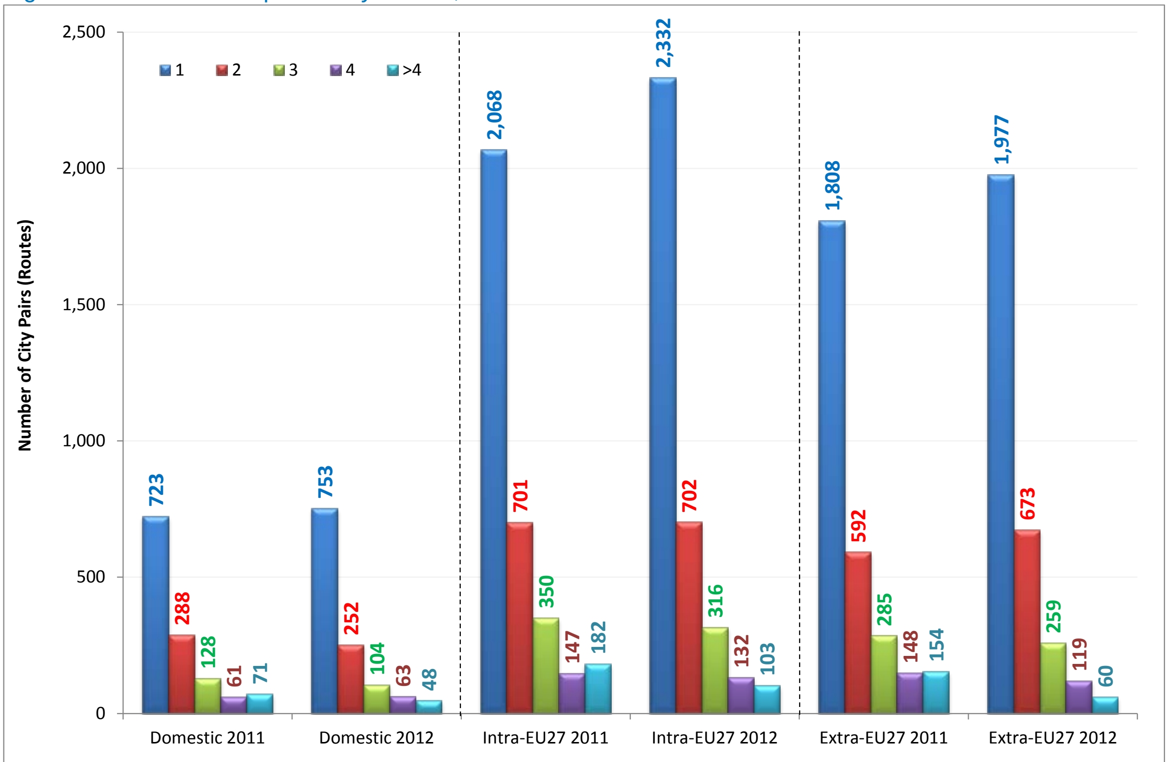
Historically, in all of the three markets, routes served by one or two carriers account for the vast majority (over 80%) of the total.

Competition in the Domestic market is characterised by faster growth on routes with one or two carriers (4% CAGR between 2005 and 2012), than on routes with three or more airlines in service (3% CAGR). In the Intra-EU market, the total number of routes has grown faster than in the other markets, an intended consequence of the introduction of the single European air transport market. Figure 1.26 shows that in 2012, there was a sharp rise in Intra-EU routes served by only one airline, but a marked fall in number of routes with three or more carriers in service. This pattern is repeated in the Extra-EU market, where the number of highly competitive routes has declined in market share relative to the number of routes served by one or two airlines.

At a macro level, the reasons for this can vary. For instance, airline bankruptcies have been a fairly common feature against the backdrop of European economic troubles, leading to carriers' inability to compete effectively on certain routes that were hitherto very competitive, but could no longer support multiple carriers because of waning demand. It can also point to an airline policy of new route stimulation being preferable to joining a route with existing competition (particularly the case for the region's LCCs).

The routes with greatest competition are likely to be those routes between the major European centres that create sufficient demand to enable multiple operators to compete for market share using price and product differentiation. Where insufficient air travel demand exists – for instance, between two small urban populations, or connecting a major urban centre with a peripheral community – the level of passenger traffic stimulated may only require one airline to serve that route.

Figure 1.26: Route competition by market, 2012 versus 2011



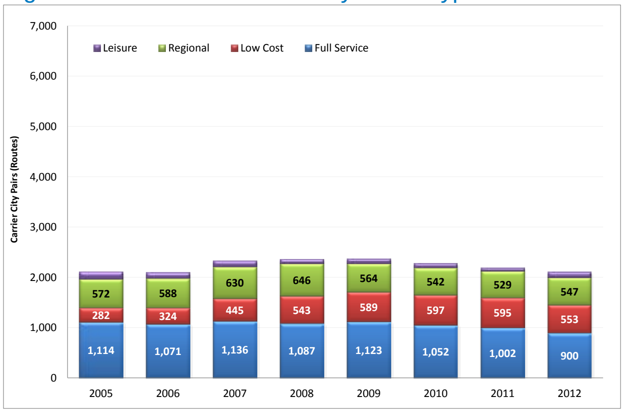
Source: OAG

1.6 Trends in Distribution of Supply by Carrier Type

Analysing the distribution of supply by carrier type (Full Service; Low Cost; Regional; Leisure[6]) reveals some interesting trends. The figures below show number of routes operated at EU27 airports by type of airline, from 2005 to 2012, by market segment.

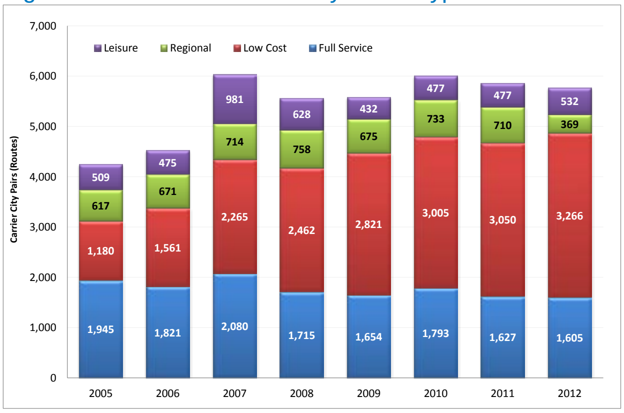
On Domestic and Intra-EU routes, a trend of Low Cost Carriers competing with and/or usurping Full Service Airlines is evident from the OAG analysis. A similar trend is exhibited on Extra-EU routes, but not to the same degree, as Full Service Airlines have generally been increasing the number of routes on which they operate, in parallel with a rise in Low Cost activity in this market segment.

Figure 1.27: Domestic routes by carrier type



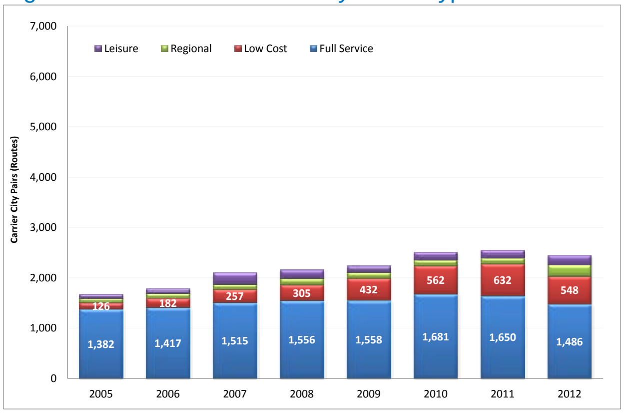
Source: OAG

Figure 1.28: Intra-EU routes by carrier type



Source: OAG

Figure 1.29: Extra-EU routes by carrier type



Source: OAG

Historically, the Low Cost Carrier segment has been the major driver of growth across all markets. On Domestic routes, LCCs now compete on 26% of the total, up from 13% in 2005. Market share has been prised from Full Service and Regional carriers alike (demonstrated in Table 1.15, Table 1.16 and Table 1.17).

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[6] Leisure carriers included in the OAG Flight Guide are defined as primarily those charter airlines operating scheduled services to holiday destinations on behalf of tour operators.

Table 1.15: Domestic routes by carrier type - % market share

Domestic	2005	2006	2007	2008	2009	2010	2011	2012	CAGR %
Full Service	52.7	51.1	48.7	46.1	47.5	46.2	45.8	42.7	-3.0%
Low Cost	13.3	15.5	19.1	23.0	24.9	26.2	27.2	26.2	10.1%
Regional	27.1	28.0	27.0	27.4	23.8	23.8	24.2	25.9	-0.6%
Leisure	6.9	5.4	5.3	3.4	3.8	3.7	2.8	5.1	-4.2%

Table 1.16: Intra-EU27 routes by carrier type - % market share

Intra-EU	2005	2006	2007	2008	2009	2010	2011	2012	CAGR %
Full Service	45.8	40.2	34.4	30.8	29.6	29.8	27.7	27.8	-2.7%
Low Cost	27.8	34.5	37.5	44.3	50.5	50.0	52.0	56.6	15.7%
Regional	14.5	14.8	11.8	13.6	12.1	12.2	12.1	6.4	-7.1%
Leisure	12.0	10.5	16.2	11.3	7.7	7.9	8.1	9.2	0.6%

Table 1.17: Extra-EU27 routes by carrier type - % market share

Extra-EU	2005	2006	2007	2008	2009	2010	2011	2012	CAGR %
Full Service	82.6	79.3	72.2	72.0	69.5	67.0	64.7	60.7	1.0%
Low Cost	7.5	10.2	12.2	14.1	19.3	22.4	24.8	22.4	23.4%
Regional	5.3	5.3	4.8	6.0	5.5	4.5	4.6	9.1	14.0%
Leisure	4.6	5.3	10.7	8.0	5.8	6.1	5.9	7.9	14.0%

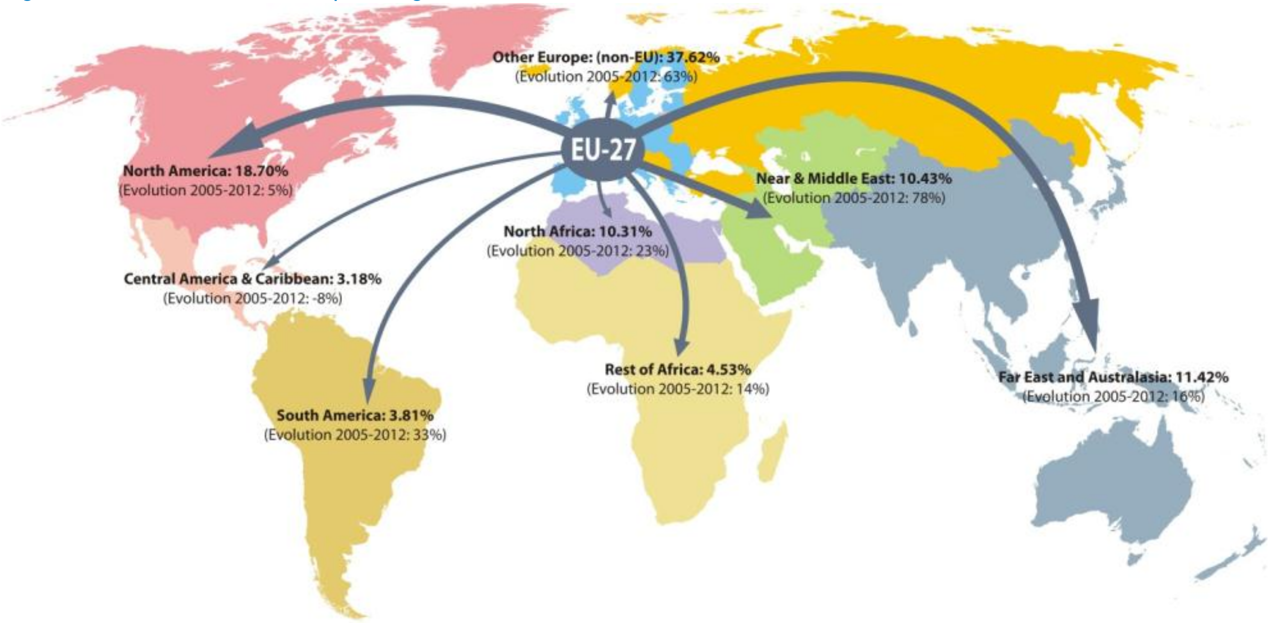
On Intra-EU operations the growth in LCCs has been explosive since 2005, with market share increasing from 28% to 57% in 2012. This implies that LCCs compete on over half the total routes between EU nations. Part of this growth has been at the expense of Full Service carriers, but there has also been a significant stimulation of new demand in this market due to LCC growth. If we refer back to subsection 1.5 and the analysis of competition in the Intra-EU market, we can assume that the growth of routes with only one airline in service is primarily due to LCC's opening up new, initially thin routes. This trend is largely repeated in the Extra-EU market.

1.7 European Union air traffic flows

Figure 1.30 shows the market share of international passenger flows from the European Union, and the associated growth between 2005 and 2012. EU27 to Other Europe (Non-EU) is the largest Extra-EU market with a 38% share and has grown in real terms by 63% since 2005. The fastest-growing market for air passenger traffic from the EU between 2005 and 2012 was the Near & Middle East, with this market 78% larger than it was in 2005, albeit its overall share remains around 10% of total Extra-EU air passenger flows.

Figure 1.31 illustrates the market share of international air cargo traffic flows from the EU. Unsurprisingly, Asia-Pacific (Far East and Australasia) is the dominant market – being the global manufacturing centre – commanding a 34% share and expanding by 25% between 2005 and 2012. The fastest-growing market for air cargo, however, is Other Europe (Non-EU), increasing by 92% since 2005, and gaining market share to represent 7% of the total Extra-EU air cargo market.

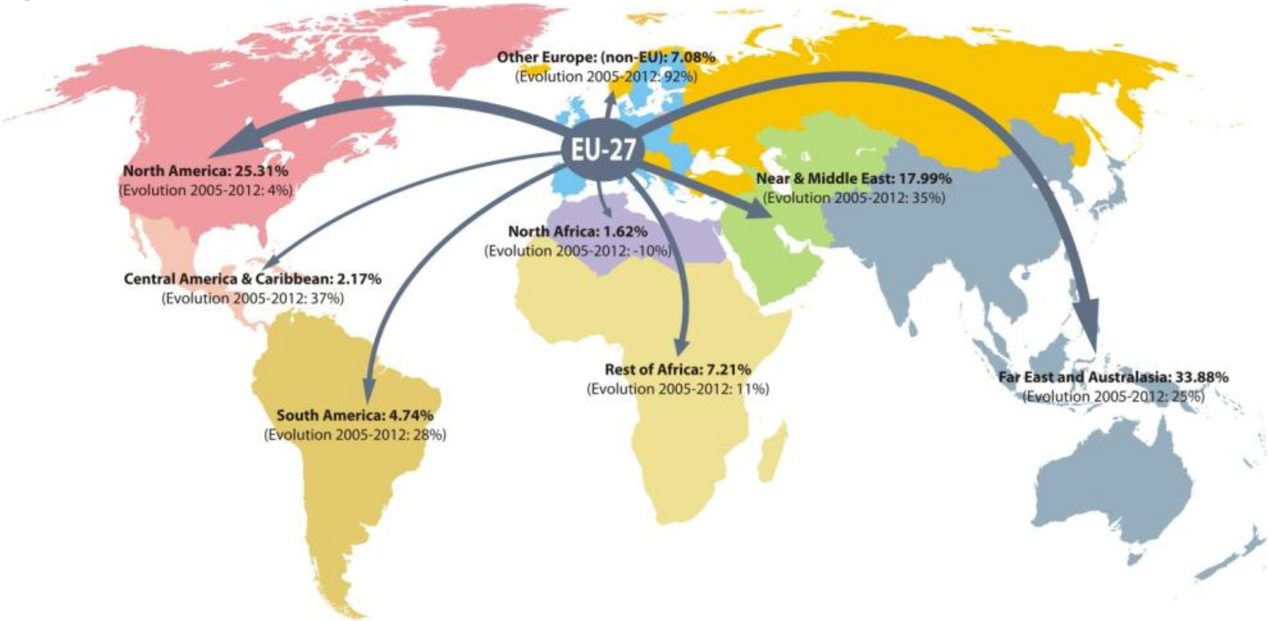
Figure 1.30: EU-27 worldwide passenger traffic flows



2005 data from Bulgaria are not available.

Source: Eurostat

Figure 1.31: EU-27 worldwide air cargo traffic flows



2005 data from Bulgaria are not available.

Source: Eurostat

1.8 Major Carriers at EEA airports

Table 1.18 displays the top 25 carriers ranked by available departing seat capacity at EEA airports in 2012. According to OAG, the airline supplying the highest seat capacity at EEA airports in 2012 was the Irish Low Cost Carrier, Ryanair, offering over 94 million seats, growing capacity 5% over 2011. Ryanair sits at the top of the rankings by some distance, dominating the intra-European market with bases across the region, and shows no signs of abating that expansion. Fellow LCC, easyJet, achieved similar growth to Ryanair in 2012 in providing over 60 million seats. Although not at the same scale as these two major LCCs, Vueling Airlines also posted strong growth (20%) on the back of expansion in its home market, Spain – Vueling's departing seat capacity at Spanish airports accounts for three quarters of its EEA total. Staying with the regions' LCC's, both Norwegian and Wizz recorded significant growth in 2012 (17% and 9% respectively). Norwegian is aggressively claiming market share across the Scandinavian market while Wizz's growth is primarily due to its 29% expansion in its home market, Hungary.

Table 1.18: Departing seat capacity by airline at all reporting EEA airports, 2011 vs 2012

				Departing Seats (millions)		
	Carrier	Country	Carrier Type	2011	2012	% chg
1	Ryanair	Ireland	Low Cost	89.90	94.34	4.9%
2	Lufthansa	Germany	Full-Service	78.27	78.29	0.0%
3	easyJet	UK	Low Cost	57.42	60.38	5.2%
4	Air France	France	Full-Service	53.17	55.13	3.7%
5	British Airways	UK	Full-Service	37.26	40.41	8.4%
6	SAS Scandinavian	Sweden	Full-Service	32.28	34.37	6.5%
7	Air Berlin	Germany	Low Cost	32.74	31.69	-3.2%
8	Iberia	Spain	Full-Service	28.59	26.72	-6.5%
9	Alitalia	Italy	Full-Service	26.80	24.95	-6.9%
10	Norwegian Air Shuttle	Norway	Low Cost	21.20	24.75	16.8%
11	KLM	Netherlands	Full-Service	21.87	22.68	3.7%
12	Vueling Airlines	Spain	Low Cost	15.89	19.12	20.4%
13	Aer Lingus	Ireland	Full-Service	13.58	13.75	1.3%
14	Wizz Air	Hungary	Low Cost	12.33	13.42	8.9%
15	Flybe	UK	Regional	12.77	13.32	4.4%
16	Austrian Airlines	Austria	Full-Service	12.90	12.28	-4.8%
17	TAP Portugal	Portugal	Full-Service	11.95	12.24	2.4%
18	Finnair	Finland	Full-Service	10.60	10.10	-4.8%
19	germanwings	Germany	Low Cost	9.27	9.45	2.0%
20	Thomson Airways	UK	Leisure	9.24	8.81	-4.6%
21	Air Europa	Spain	Leisure	9.53	8.24	-13.5%
22	Brussels Airlines	Belgium	Full-Service	7.94	7.87	-0.9%
23	Aegean Airlines	Greece	Full-Service	8.72	7.69	-11.9%
24	Swiss/Crossair	Switzerland	Full-Service	6.74	7.04	4.4%
25	Turkish Airlines	Turkey	Full-Service	5.65	6.92	22.5%

Source: OAG

Nb: Note that OAG reports Air France and KLM separately

In the Full-Service airline segment, there were strong performances in 2012 for British Airways (8% growth 2012 versus 2011), SAS Scandinavian (7%), and entry into the Top 25 for Turkish Airlines (22%), as it continues to increase its presence at EEA airports and provided nearly 7 million departing seats in this bloc in 2012. The Turkish carriers' policy of providing access to its Istanbul hub from European airports has seen the airline expand operations in key markets such as Germany, Italy and the UK, as well as smaller emerging markets in Scandinavia and Hungary for instance. British flag carrier BA's growth in the region was mainly attributable to its 9% expansion at UK airports – the UK accounted for 75% of BA's total EEA departing seat capacity in 2012.

The poorest performing airlines in the Top 25 in 2012 included Spanish leisure airline, Air Europa (-13%); de facto Greek national airline, Aegean (-12%); Italy's flag carrier, Alitalia (-7%); and Spanish network operator, Iberia (-7%). Each of these struggling airlines has a common theme, operating in economically troubled home markets with the consequential impact on air travel demand.

1.9 Air Cargo Traffic Growth

1.9.1 Air Cargo by Global Region

This section addresses trends in air cargo traffic growth in 2012 rather than reporting on absolute numbers due to publicly sourced data from IATA.

Table 1-19: Summary of Air Cargo Traffic growth by Region in 2012 vs 2011

	Africa	Asia Pacific	Europe	Latin America	Middle East	North America	Industry
Freight Tonne Kilometres (FTKs) % chg 2012 v 2011	7.1%	-5.5%	-2.9%	-1.2%	14.7%	-0.5%	-1.5%

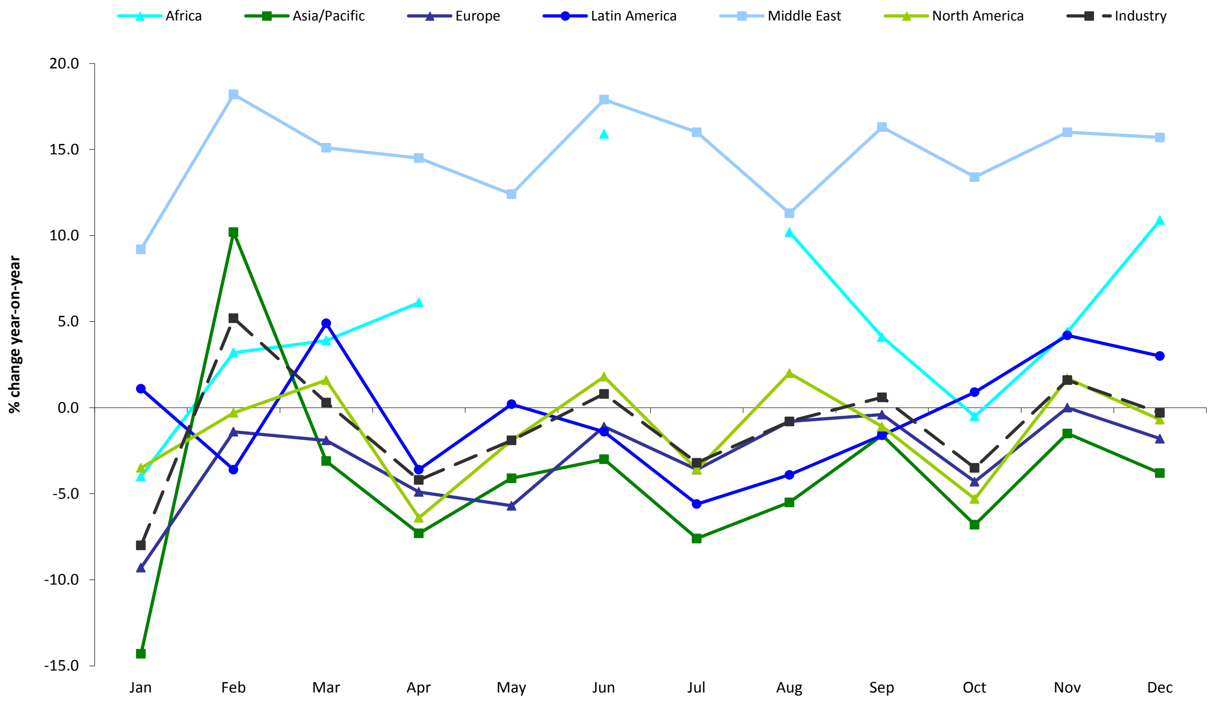
Source: IATA

According to IATA, its member airlines collectively recorded a decline in air cargo traffic – measured in Freight Tonne Kilometres (FTKs) – of 1.5% in 2012 over 2011 levels, further compounding the decline of 0.6% the previous year. IATA cites a sharp slowdown in world trade growth and shifts in commodity mix favouring sea transport as being responsible for placing further downward pressure on air cargo demand.

Airlines in all regions were affected, with the exception of African and Middle Eastern carriers who witnessed FTK growth of 7.1% and 14.7% respectively, supported by new trade links between Africa and Asia.

The worst affected region was Asia Pacific, with airlines seeing a 5.5% contraction in air cargo traffic in 2012. In terms of global trade, Asia Pacific is a major manufacturing centre and source of outbound cargo to keys markets in Europe and North America. Demand for manufactured commodities in these two regions was weak throughout 2012, giving airlines of Asia Pacific, Europe and North America fewer goods to transport.

Figure 1.32: Freight Tonne Kilometre (FTK) Growth by Region 2012 vs. 2011



Source: IATA

Nb: May and July figures for Africa unavailable.

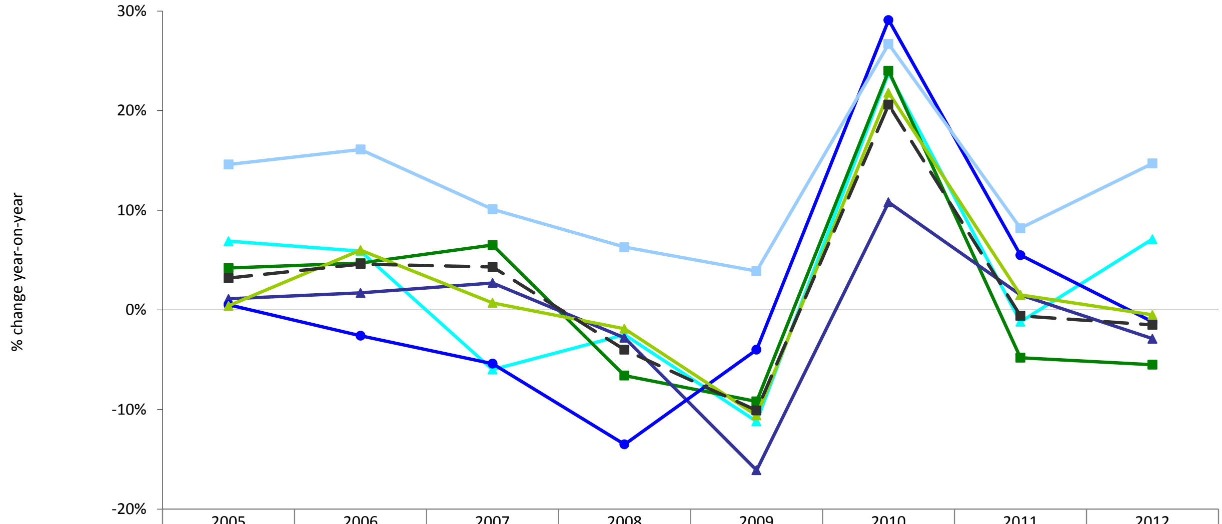
Figure 1.32 shows the monthly pattern of air cargo traffic growth across 2012. As noted above, the Middle Eastern carriers proved the stellar performers across the year, achieving high growth in each month with some variation. Barring a spike in air cargo demand in February, Asia Pacific airlines posted declines in every month of 2012. The spike in February has been attributed to the postponement of shipments in January during the Chinese New year holiday, pushing up the industry average.

The industry average is heavily influenced by the Asia Pacific results, as this region's airlines commanded a 39% share of the air cargo market in 2012.

Figure 1.33 shows the historical growth of air cargo carried on airlines by global region. Since 2005, Middle Eastern airlines have consistently outperformed the industry average in terms of air cargo growth rates achieved. This is primarily due to the region's emergence and consolidation as an international transit hub between Asia and Europe. Airlines such as Emirates, Etihad and Qatar Airways serving the Middle Eastern airport hubs have a high proportion of widebody aircraft fleet with greater capacity to carry cargo.

Although 2010 experienced a strong spike in demand growth, this is merely a recovery to pre-economic air cargo levels following poor growth in 2008 and 2009. The industry average since 2010 has trended downwards, due in large part to weak demand for outbound air cargo in Asia Pacific from the Western markets.

Figure 1.33: Historical Air Cargo Growth by Region 2005-2012



	2005	2006	2007	2008	2009	2010	2011	2012
Africa	6.9%	5.9%	-6.0%	-2.5%	-11.2%	23.8%	-1.2%	7.1%
Asia/Pacific	4.2%	4.7%	6.5%	-6.6%	-9.2%	24.0%	-4.8%	-5.5%
Europe	1.1%	1.7%	2.7%	-2.8%	-16.1%	10.8%	1.5%	-2.9%
Latin America	0.5%	-2.6%	-5.4%	-13.5%	-4.0%	29.1%	5.5%	-1.2%
Middle East	14.6%	16.1%	10.1%	6.3%	3.9%	26.7%	8.2%	14.7%
North America	0.4%	6.0%	0.7%	-1.9%	-10.6%	21.8%	1.5%	-0.5%
Industry	3.2%	4.6%	4.3%	-4.0%	-10.1%	20.6%	-0.6%	-1.5%

Source: IATA

1.9.2 Air Cargo by Worldwide Airport

Global airport cargo throughput is also indicative of where the main trade flow growth is focussed. The Top 30 worldwide airports by air cargo throughput, as reported by ACI, are dominated by Asia Pacific – accounting for 44% of the top 30 airports' combined volume in 2012. Three of the top five airports in 2012 are in the Asia Pacific region, but when looking at growth, two of these three declined year-on-year (Shanghai -4.7%; Seoul -3.2%), reflecting weak demand in the major manufacturing centres of China and South Korea.

In Europe, the standout result comes from the cargo express integrator DHL's base in Leipzig, recording nearly 14% growth in cargo traffic in 2012, reflecting a greater demand for the integrators' product in Europe. Despite this, the four major European air cargo hubs of Paris CDG, Frankfurt, London Heathrow and Amsterdam, all posted declines.

Table 1-20: Top 30 Worldwide Airports by Air Cargo Throughput (000's tonnes) & Growth in 2012

Rank	Airport Name	Region	2012	% chg
1	Hong Kong (HKG)	Asia Pacific	4,067	2.3
2	Memphis (MEM)	N. America	4,016	2.5
3	Shanghai (PVG)	Asia Pacific	2,939	-4.7
4	Anchorage (ANC)	N. America	2,464	-3.1
5	Seoul (ICN)	Asia Pacific	2,457	-3.2
6	Paris (CDG)	Europe (EU)	2,151	-6.5

Airport Name	Region	% chg
Leipzig Halle (LEJ)	Europe (EU)	13.7
Beijing (PEK)	Asia Pacific	9.7
Guangzhou (CAN)	Asia Pacific	5.8
Los Angeles (LAX)	N. America	5.0
Miami (MIA)	N. America	4.8
Doha (DOH)	Middle East	4.5

Rank	Airport Name	Region	2012	% chg
7	Frankfurt (FRA)	Europe (EU)	2,066	-6.7
8	Dubai (DXB)	Middle East	2,280	3.9
9	Louisville (SDF)	N. America	2,168	-0.9
10	Tokyo Narita (NRT)	Asia Pacific	2,006	3.1
11	Singapore (SIN)	Asia Pacific	1,842	-3.0
12	Miami (MIA)	N. America	1,930	4.8
13	Los Angeles (LAX)	N. America	1,781	5.0
14	Beijing (PEK)	Asia Pacific	1,800	9.7
15	Taiwan (TPE)	Asia Pacific	1,577	-3.1
16	London Heathrow (LHR)	Europe (EU)	1,556	-0.8
17	Amsterdam (AMS)	Europe (EU)	1,512	-2.4
18	New York (JFK)	N. America	1,283	-4.5
19	Bangkok (BKK)	Asia Pacific	1,345	1.8
20	Chicago (ORD)	N. America	1,254	-4.4
21	Guangzhou (CAN)	Asia Pacific	1,249	5.8
22	Indianapolis (IND)	N. America	989	1.8
23	Tokyo Haneda (HND)	Asia Pacific	910	4.2
24	Shenzhen (SZX)	Asia Pacific	855	3.2
25	New York (EWR)	N. America	744	-8.5
26	Doha (DOH)	Middle East	845	4.5
27	Leipzig Halle (LEJ)	Europe (EU)	846	13.7
28	Osaka (KIX)	Asia Pacific	723	-2.7
29	Cologne-Bonn (CGN)	Europe (EU)	730	0.5
30	Kuala Lumpur (KUL)	Asia Pacific	702	1.1

Airport Name	Region	% chg
Tokyo Haneda (HND)	Asia Pacific	4.2
Dubai (DXB)	Middle East	3.9
Shenzhen (SZX)	Asia Pacific	3.2
Tokyo Narita (NRT)	Asia Pacific	3.1
Memphis (MEM)	N. America	2.5
Hong Kong (HKG)	Asia Pacific	2.3
Indianapolis (IND)	N. America	1.8
Bangkok (BKK)	Asia Pacific	1.8
Kuala Lumpur (KUL)	Asia Pacific	1.1
Cologne-Bonn (CGN)	Europe (EU)	0.5
London Heathrow (LHR)	Europe (EU)	-0.8
Louisville (SDF)	N. America	-0.9
Amsterdam (AMS)	Europe (EU)	-2.4
Osaka (KIX)	Asia Pacific	-2.7
Singapore (SIN)	Asia Pacific	-3.0
Anchorage (ANC)	N. America	-3.1
Taiwan (TPE)	Asia Pacific	-3.1
Seoul (ICN)	Asia Pacific	-3.2
Chicago (ORD)	N. America	-4.4
New York (JFK)	N. America	-4.5
Shanghai (PVG)	Asia Pacific	-4.7
Paris (CDG)	Europe (EU)	-6.5
Frankfurt (FRA)	Europe (EU)	-6.7
New York (EWR)	N. America	-8.5

Source: ACI Worldwide Airport Traffic Report

Table 1-20 illustrates the general weak demand for air cargo across the globe as fourteen of the world's Top 30 airports suffered declines in 2012 versus 2011.

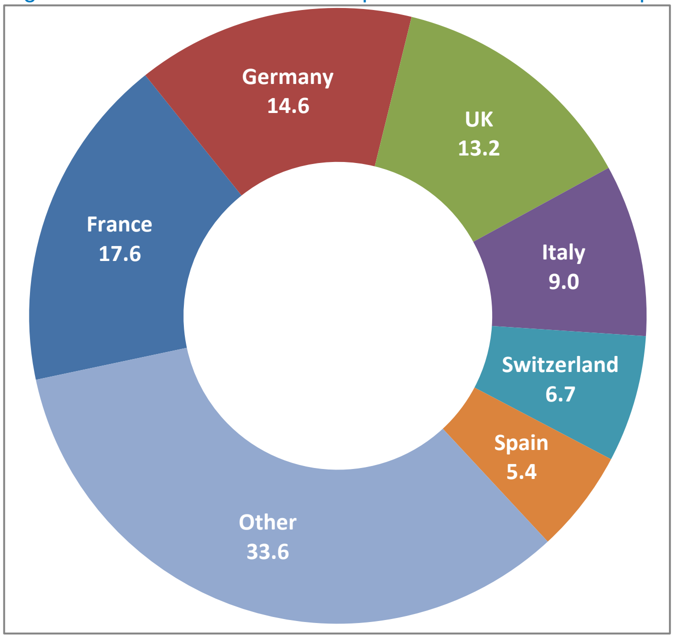
1.10 Business Aviation

1.10.1 Europe Overview

According to Eurocontrol[7], business aviation in Europe in 2012 recorded a decline of 3.8% on average, based on total flights of business aviation aircraft types. France, Germany and the United Kingdom combined accounted for nearly half of all business aviation departures in Europe in 2012, as highlighted in Figure 1.34. Every top market experienced decline (except Turkey), with Italy dragging the European average down by recording -14%.

[7] Briefing: Business Aviation in Europe in 2012; Eurocontrol; October 2013

Figure 1.34: States' share of European business aviation departures in 2012

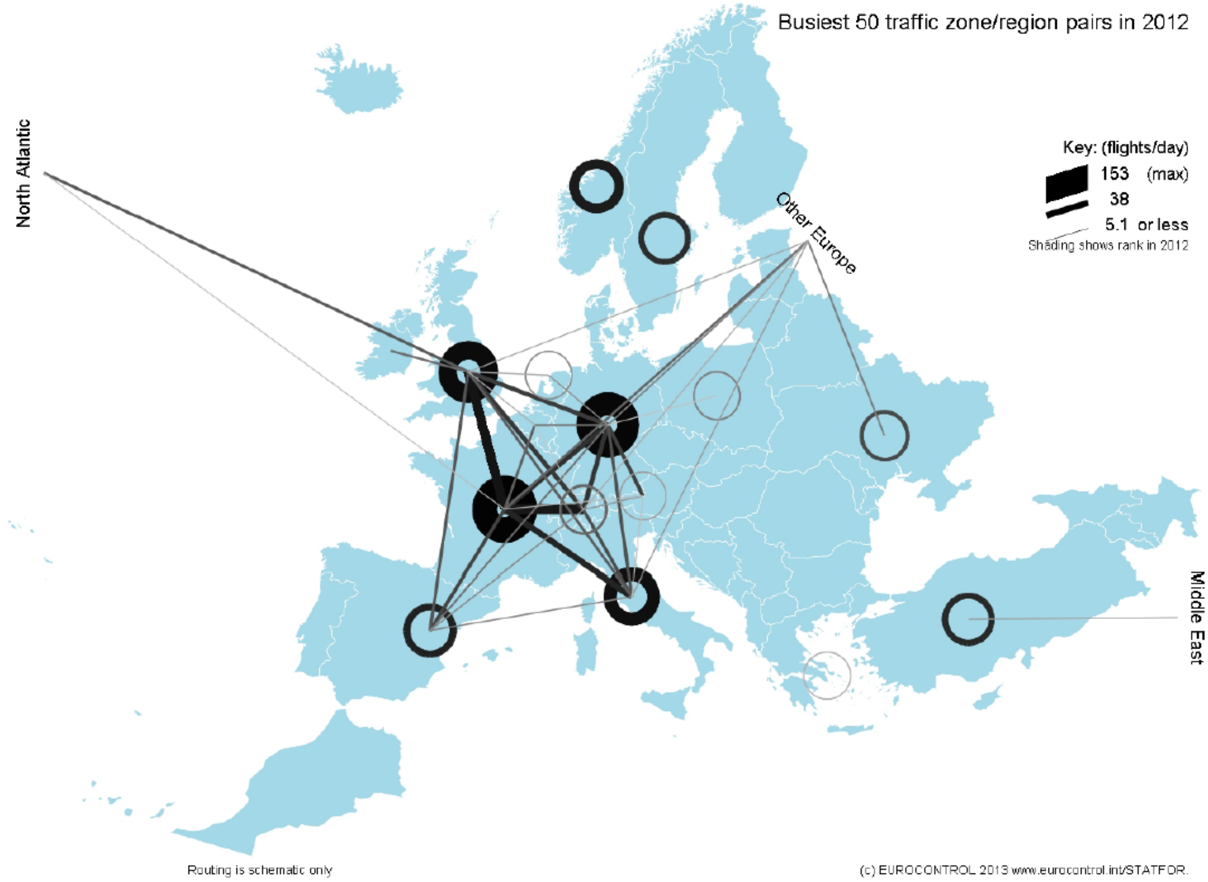


Source: Eurocontrol; 'Briefing: Business Aviation in Europe in 2011'; May 2012

Of the top ten business aviation airports in Europe, Nice was unique in 2012 in reporting positive growth, and even this was marginal at 0.2%. It reflects a scene of depressed demand across the region. The busiest business aviation airport on the continent, Paris Le Bourget, saw activity decline by 5.5%. Outside of the top ten, Stuttgart (9.6%), Kiev-Zhulyany (106.8%) and Istanbul-Sabiha Gokcen (76%) all bucked the trend to post solid growth. Italy, it was mentioned above, has dragged down the European average. This is mainly attributable to heavy losses reported at the key business aviation airports of Milan Linate (-11%) and Rome Ciampino (-19%).

Figure 1.35 shows the major business aviation traffic flows in 2012 both between European States and with regions outside. France domestic remains the single busiest domestic market, with Germany second and the UK third. Internationally, the top business aviation traffic flow is France-UK, followed by France-Switzerland and France-Italy.

Figure 1.35: Busiest 50 Traffic Zone/Region Pairs for Business Aviation Departures in 2012

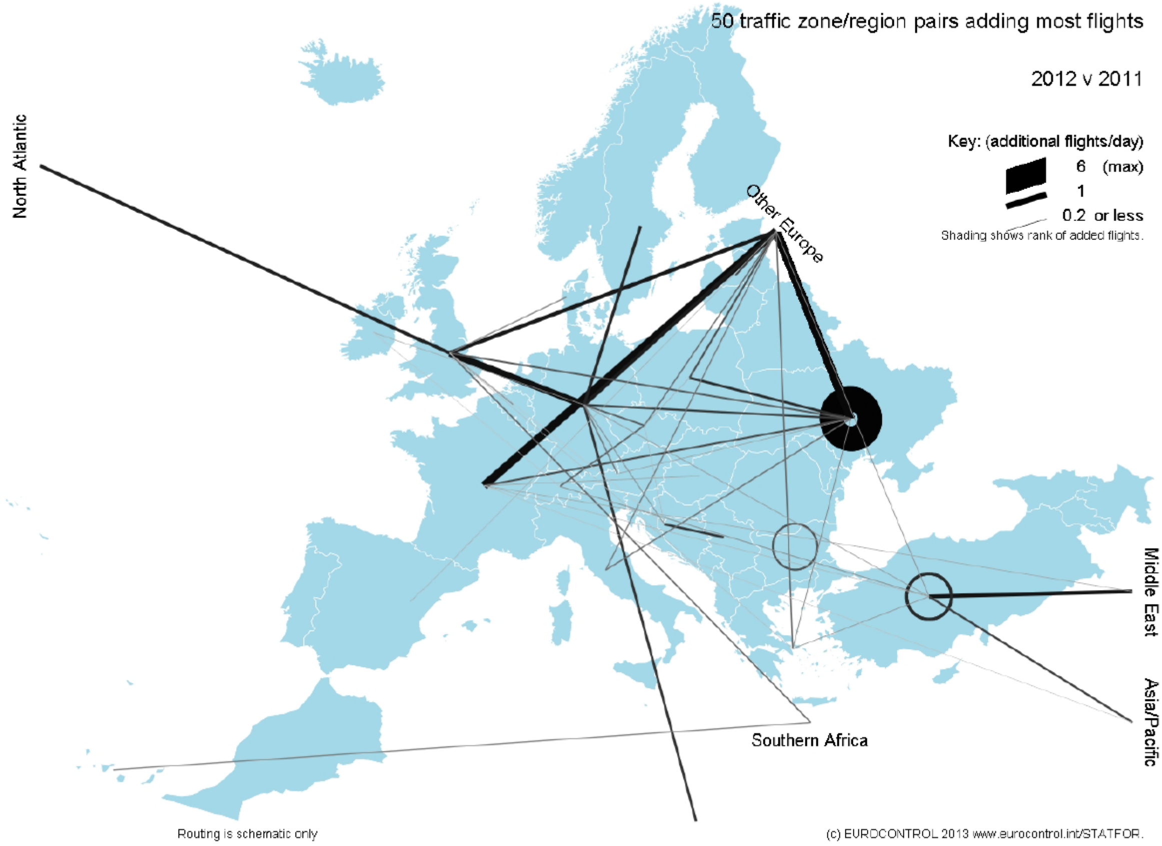


Note: Other Europe is mainly represented by Russia

Source: Eurocontrol; 'Briefing: Business Aviation in Europe in 2011'; May 2012

Figure 1.36 highlights the routes and markets recording the highest growth in business aviation activity in 2012. The exceptional event of the UEFA European Football Championship in June 2012 distorted figures somewhat by introducing new Ukrainian domestic routes such as Donetsk-Kiev Zhulyany. This resulted in the Ukraine domestic market being the fastest growing flow in Europe in 2012.

Figure 1.36: 50 Traffic Zone/Region Pairs adding most business aviation flights in 2011 vs 2010



Note : Other Europe is mainly represented by Russia

Source: Eurocontrol; 'Briefing: Business Aviation in Europe in 2011'; May 2012

1.10.2 Focus on global manufacturers

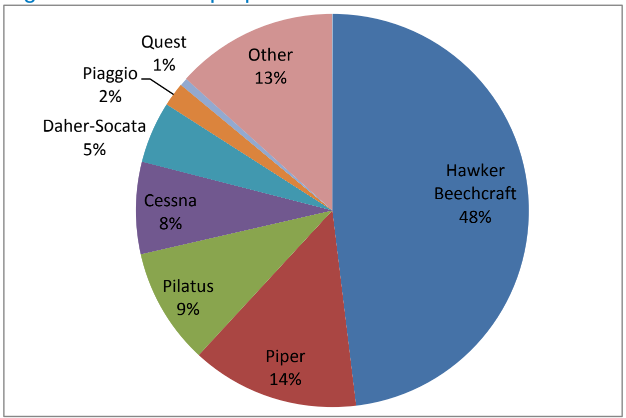
The Business Aviation industry's recovery is continuing to be stifled by the fragile state of the world's largest economies, coupled with political volatility in global hot spots.

There is a paradox, presently, where a halt and reversal in the decline in key indicators has not been met with a full scale recovery in demand for business aviation. It is reported that unsold inventories are down, utilisation and fuel sales are up and, critically, in the United States (home to the largest inventory of business aircraft) business confidence and corporate profits are strong.

In Flight International's 2012 business aircraft census, using data compiled by Flightglobal's Ascend Fleets database, inventories for the 12 months from 30 September 2011 are shown.

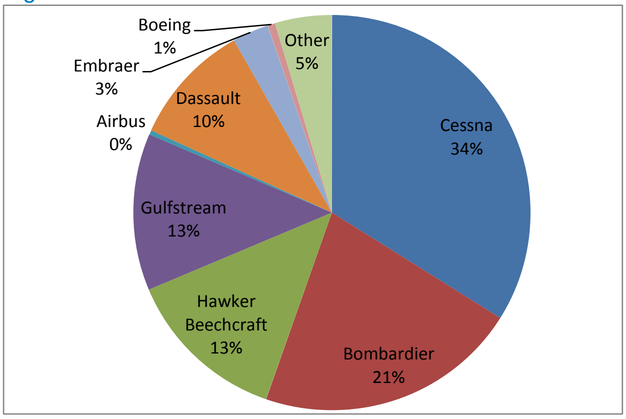
According to the census, the jet inventory grew by 565 aircraft to 17,974, whilst the turboprop tally rose by 180 aircraft to just over 11,700.

Figure 1.37: Turboprop manufacturer market share 2012



Source: Flightglobal Ascend Fleets

Figure 1.38: Business Jet manufacturer share 2012



Source: Flightglobal Ascend Fleets

Figure 1.37 and Figure 1.38 show market shares for global inventories of business jet and turboprop aircraft. Hawker Beechcraft dominates the business turboprop aircraft market with nearly half of the global share. It’s most popular in-production jets are the midsize Hawker 900XP and the larger Hawker 4000, but it is the twin-engined turboprop King Air fleet that has driven modest growth for this manufacturer in 2012.

Cessna owns one third of the global business jet inventory. This segment is dominated by its Citation family, which number over 6,000 in 2012.

In the census period, with the key North American market yet to fully recover, Latin America and Asia-Pacific have continued to be a lifeline for many manufacturers. The business aircraft fleet (jet and turboprop) in Latin America/Caribbean jumped since the last census by 207 aircraft to 3,912.

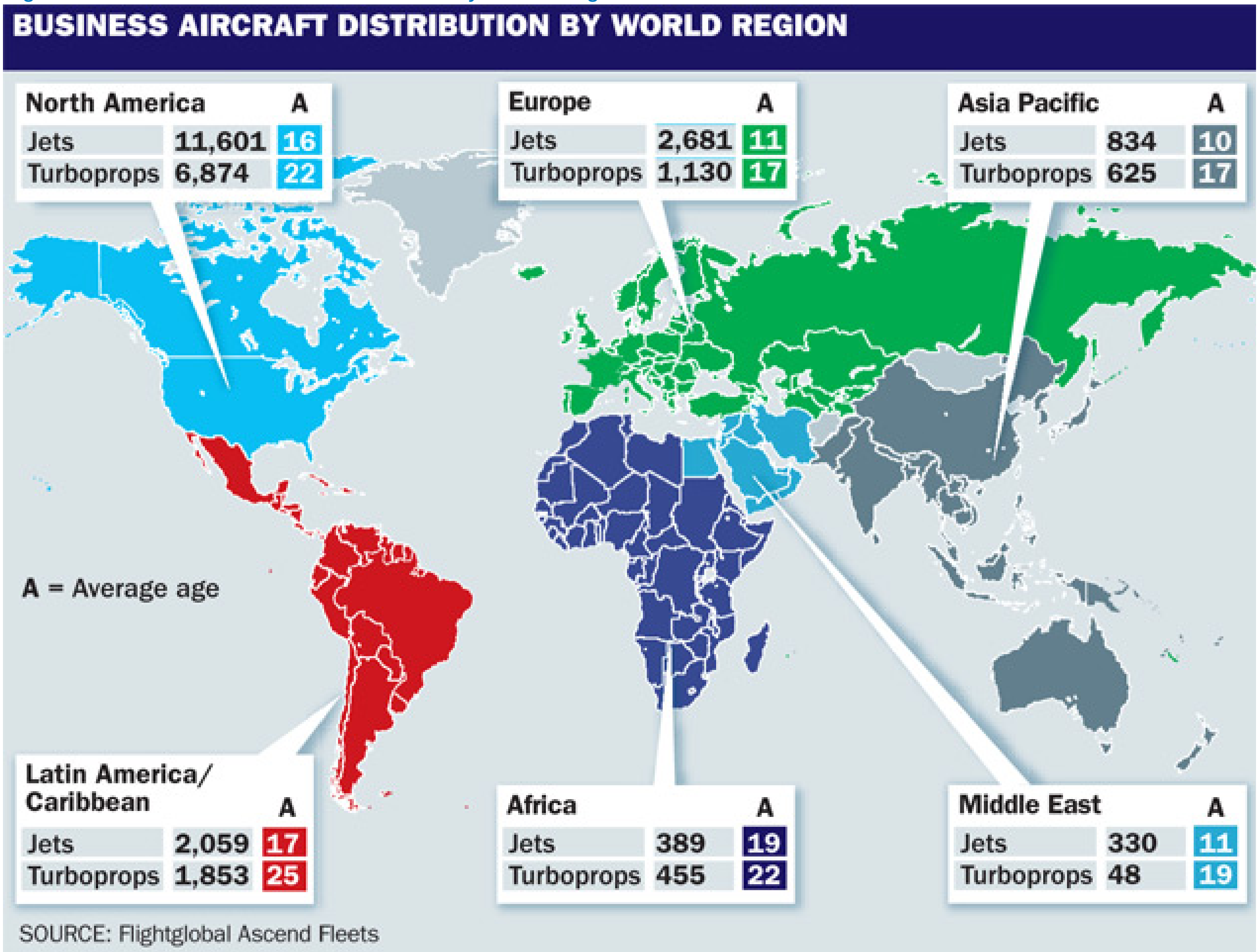
This rise of nearly 6% is mostly attributable to Brazil and Mexico, where demand for these types is outpacing the industry average. In Brazil – home to the largest inventory of turboprops in the region – the fleet rose by nearly 150 to 1,371 business aircraft, and in Mexico – which has Latin America's largest business jet fleet – the tally climbed by more than 4% to 1,003 jets and turboprops.

Figure 1.39 illustrates the global distribution of business jets and turboprops in 2012.

Developments in the United States are so vital to the fortunes of business aircraft manufacturers. It is welcome news, then, that Flightglobal's Ascend Online database revealed the inventory of jets and turboprops in the US rose by more than 300 during the census period to 17,438 turbine business aircraft. So while the US market remains fragile, signs of recovery are emerging.

Europe, in contrast, endured a poor 2012. Ascend's database shows the continent's business jet and turboprop fleet contracted during the census period, from 3,841 to 3,811 aircraft. This has been largely driven by the ongoing financial crises impacting on aircraft cancellations and depleted sales.

Figure 1.39: Business Aircraft Distribution by World Region, 2012



Source: Flightglobal Ascend Fleets

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2. Air Transport Forecasts

2.1 Introduction

In this chapter we provide an overview of the projected future growth in passengers, cargo and air transport movements over the next twenty year period. The analysis of future aviation developments is crucial for medium and long-term infrastructure capacity planning and for increasing the efficiency of the aviation system.

The forecasts presented in this chapter are obtained from the most recent and publicly accessible respected industry sources, which provide an outlook of the expected aviation trends at a regional level

The chapter is organised by first examining forecasts of Gross Domestic Product (GDP), widely recognised as the primary driver of air transport demand. The ICAO short term passenger forecast is analysed, followed by long term passenger forecasts based primarily on the latest versions (2013) of Boeing's Current Market Outlook[8] and Airbus Global Market Forecast[9]. Forecasts of air transport movements are then analysed (based on Eurocontrol's Flight Movement Forecast), followed by the review of Boeing's air cargo estimates to 2035.

2.2 Review of GDP forecast

Economic development and prosperity are the principal drivers for the underlying demand for air transport, with GDP and its growth being the main measurement of economic activity for econometric-based air transport forecasts.

IHS Global Insight, a major economic forecasting organisation, produces a GDP forecast which is used by aircraft manufacturers such as Boeing, Airbus, Embraer and Bombardier. According to IHS, global GDP will grow on average 3.2 % per annum between 2012 and 2032. As shown in Figure 2.1 the strongest contributors to this growth are two of the BRIC[10] countries, India and China, delivering GDP growth double the world average. Interestingly, the Asia Pacific area, after removing the effect of the two BRIC countries growth, is expected to have a rate of growth lower than other regions. Compared to the previous 2011 forecast, China's growth has been reviewed downward, from 7.2% to 6.6%, thus influencing negatively the global GDP prospects, contracting from 3.4% to 3.2% per year.

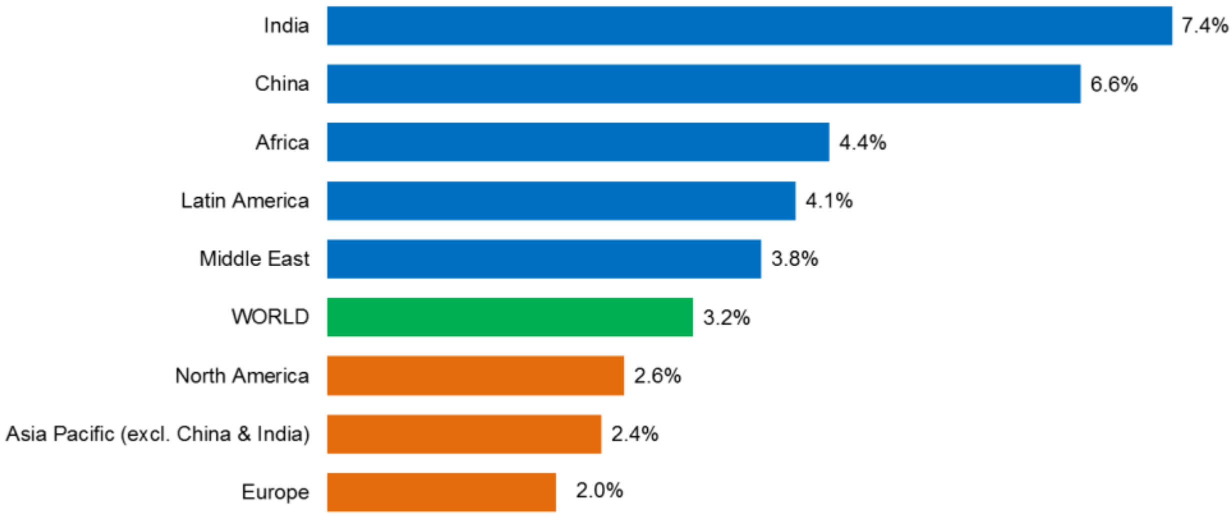
Europe and North America, the most mature air transport markets, show modest growth below the world average over the forecast horizon. Africa, Latin America and the Middle East economies are forecasted to expand above the world average.

[8] Current Market Outlook 2013-2032, The Boeing Company 2013 (released June 2013)

[9] Global Market Forecast 2013-2032, Airbus Industrie 2013 (released September 2013)

[10] The acronym BRIC refers to the nations of Brazil, Russia, India and China; commonly viewed as leaders in economic growth.

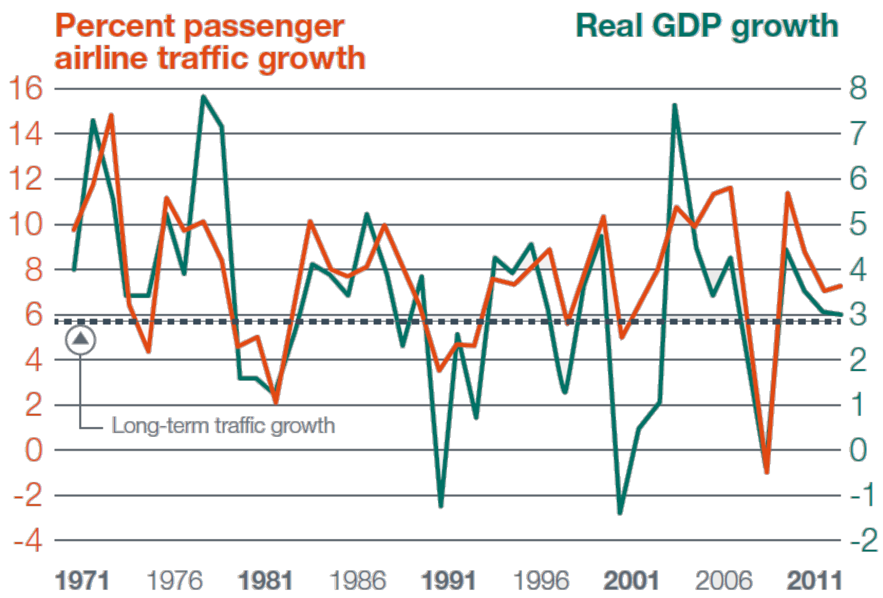
Figure 2.1: Average Annual GDP Growth 2012-2032



Source: Bombardier/Global Insight

The relationship between demand for air transport and GDP growth is broadly acknowledged. A visual representation of the pattern of revenue passenger kilometres (RPK) and GDP, as shown in Figure 2.2 below, emphasises the correlation between the measures. Air transport demand is often measured in RPK. This is a measure of the number of fare paying passengers multiplied by the number of kilometres flown.

Figure 2.2: Change in Global GDP (constant) vs. Change in Passenger Traffic (RPK) 1971-2011

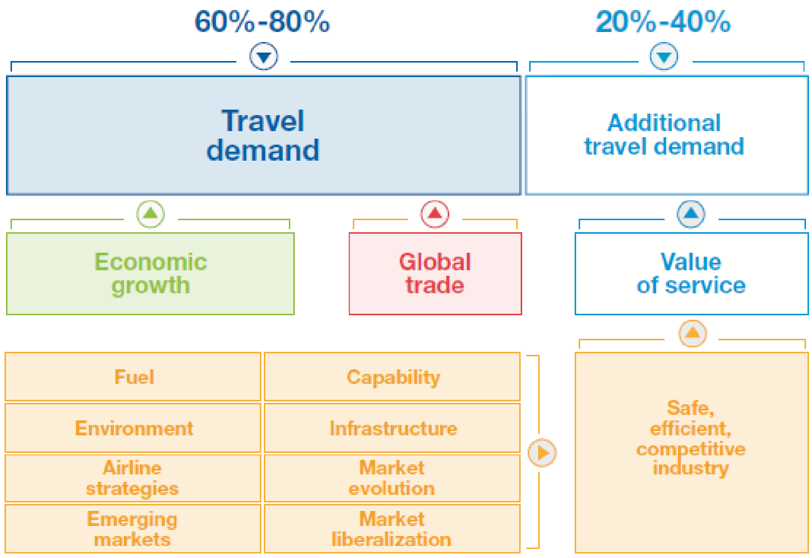


Source: Boeing

GDP is not the exclusive variable factor for the explanation of variation in air transport main KPIs (passengers, aircraft movements and cargo traffic). Aircraft manufacturer forecasts consider a number of other factors which are related to the variations in demand. Some of these supplementary factors influencing demand are related to economic activity (for example the rapid urbanisation resulting from the rise of the middle classes in emerging economies), other drivers are based on operational and political developments, such as the further adoption of the low cost carrier (LCC) business model or the continued liberalisation and deregulation of air transport markets.

The interrelationships of these factors and their role in driving long term air transport growth and the preparation of industry forecasts are shown below in Figure 2.3.

Figure 2.3: Drivers of Air Travel Demand



Source: Boeing

According to Airbus, the main drivers for growth over the forecast period 2012 to 2032 are considered to be[11]:

- Growth of aviation mega-cities due to urban population growing from 51% today to 60%, producing more wealth and increasing the propensity to travel.
- Economic growth driven by emerging markets: more first time flyers and an expanding middle class which will grow from 2.2 billion today to 5.2 billion.
- Growth in tourism which will stimulate air travel demand.
- Liberalisation of air transport markets in Asia, Africa and Latin America.
- Replacement of old models with more eco-efficient aircraft.
- The low cost model is expected to grow in the Asia Pacific and Africa regions

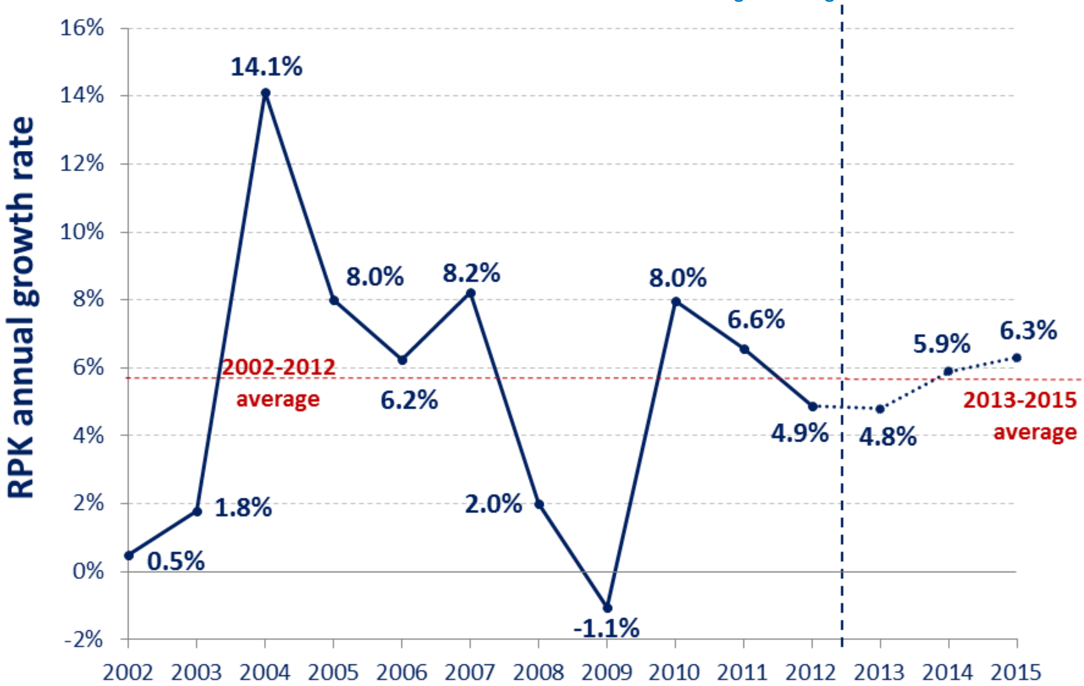
[11] Airbus Global Market Forecast 2012-2032

2.3 Short Term Forecast

A short term passenger traffic forecast for the period 2013 to 2015 was produced by ICAO in 2013, using 2012 preliminary figures as a base. ICAO expects global growth in 2013, 2014 and 2015 of 4.8%, 5.9% and 6.3% respectively. In the previous forecast for 2013 and 2014 the projected growth was of 6.0% and 6.4%, so ICAO has revised downwards its expectations of air passenger growth.

The forecast traffic is derived from the prevailing economic conditions at a regional level and as such vary by geographic region. Looking at Table 2.1, the Middle East is projected to be the fastest growing region, attributable to its carriers' performance with ever-increasing market share gains. The Middle East is followed by Latin America, Asia Pacific and Africa. Europe is projected to grow faster than North America, albeit this growth will be slower than in the emerging markets.

Figure 2.4: ICAO – World RPK Historic and Medium Term Forecast Percentage Change



Source: ICAO Medium Term Forecast 2013

Table 2.1: ICAO – RPK Annual Growth Rates Forecast

Region of Airline Registration	History		Forecast		
	2011 (%)	2012* (%)	2013 (%)	2014 (%)	2015(%)
Europe	9.5	3.9	4.4	5.5	6.2
Africa	0.9	4.2	5.2	5.7	6.0
Middle East	9.2	13.7	10.2	11.2	10.8
Asia Pacific	6.8	6.4	5.5	6.4	6.8
North America	2.4	1.3	2.3	3.3	3.8
Latin America/Caribbean	11.1	8.6	7.6	8.7	8.0
World	**6.5**	**4.5**	**4.8**	**5.9**	**6.3**

Source: ICAO Medium Term Forecast 2012 *Preliminary figures

2.4 Long Term Airline Passenger Forecasts

2.4.1 Global Airline Passenger Growth

In this section we examine the long term airline passenger forecasts published by aircraft manufacturers Boeing and Airbus. Both have produced a broad long term global market forecast for the period 2013 to 2032 using 2012 as the base year. Boeing and Airbus employ similar methodologies to form the forecast. At an aggregate level the two sets of predictions are largely comparable with each other. However, there are some key differences between the two manufacturers forecasts, which will be discussed whenever these influence the estimates results at a macro level.

In its 2011 market outlook, Boeing's forecast for 2030 was for 13.3 trillion RPK worldwide. The most up-to-date analysis produced by the American manufacturer predicts 14.7 trillion RPK by 2032. The average annual growth rate is similar but revised downward marginally (5.1% in 2011 versus 5.0% in 2013). Airbus points out in its forecast that historically (since the 1970s) air traffic has doubled every fifteen years and will do so again by 2025. In its previous forecast, Airbus predicted average annual RPK growth of 4.8% between 2011 and 2031. This is in agreement with the most recent forecast by the European manufacturer.

Table 2.2: Boeing & Airbus Forecast Comparison

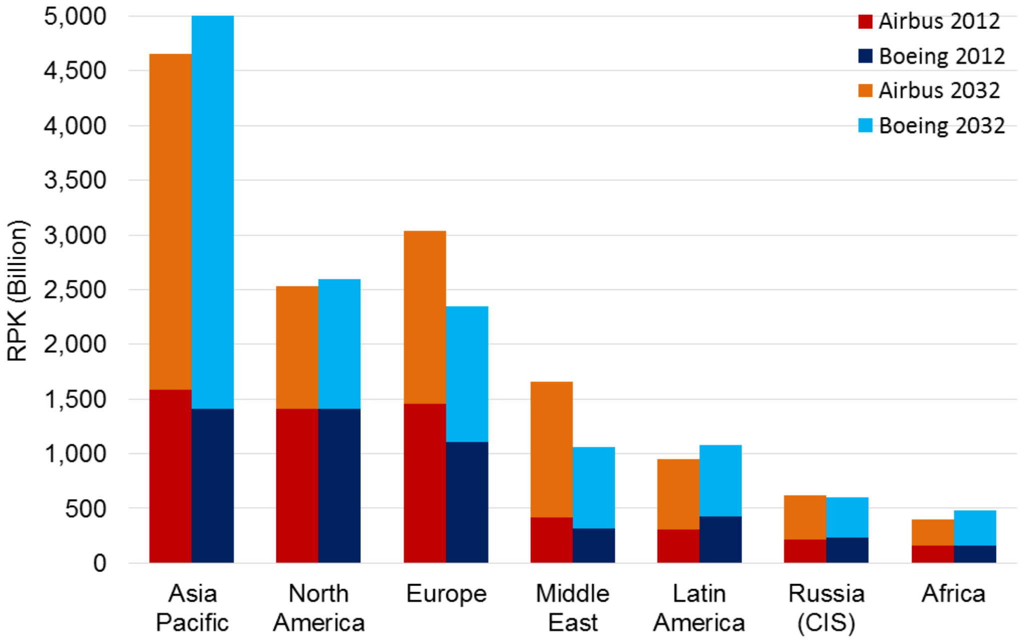
	Boeing	Airbus
RPK (trillion) 2012	5.5	5.5
RPK (trillion) 2032	14.6	13.9
Total Growth 2012 – 2032	164%	151%
Average Annual Growth Rate	**5.0%**	**4.7%**

Source: Boeing, Airbus

2.4.2 Airline Passenger Growth by World Region

Figure 2.5 demonstrates the differences in the forecasts at a regional level, even though they are analogous on a twenty-year forecast horizon. These differences can be explained by the discordancy on the volume of airline traffic carried in the base year in each year. The differences that occur are due to the forecasts disagreeing on the amount of airline traffic carried in the base year in each region combined with changing forecast growth rates. For example, Boeing forecasts a robust annual average growth rate of 6.8% for Asia Pacific compared with 5.5% from Airbus. Conversely, Airbus predicts growth of 7.1% for the Middle East whereas Boeing has determined 6.2%.

Figure 2.5: Boeing & Airbus Regional Forecast Comparison 2012-2032



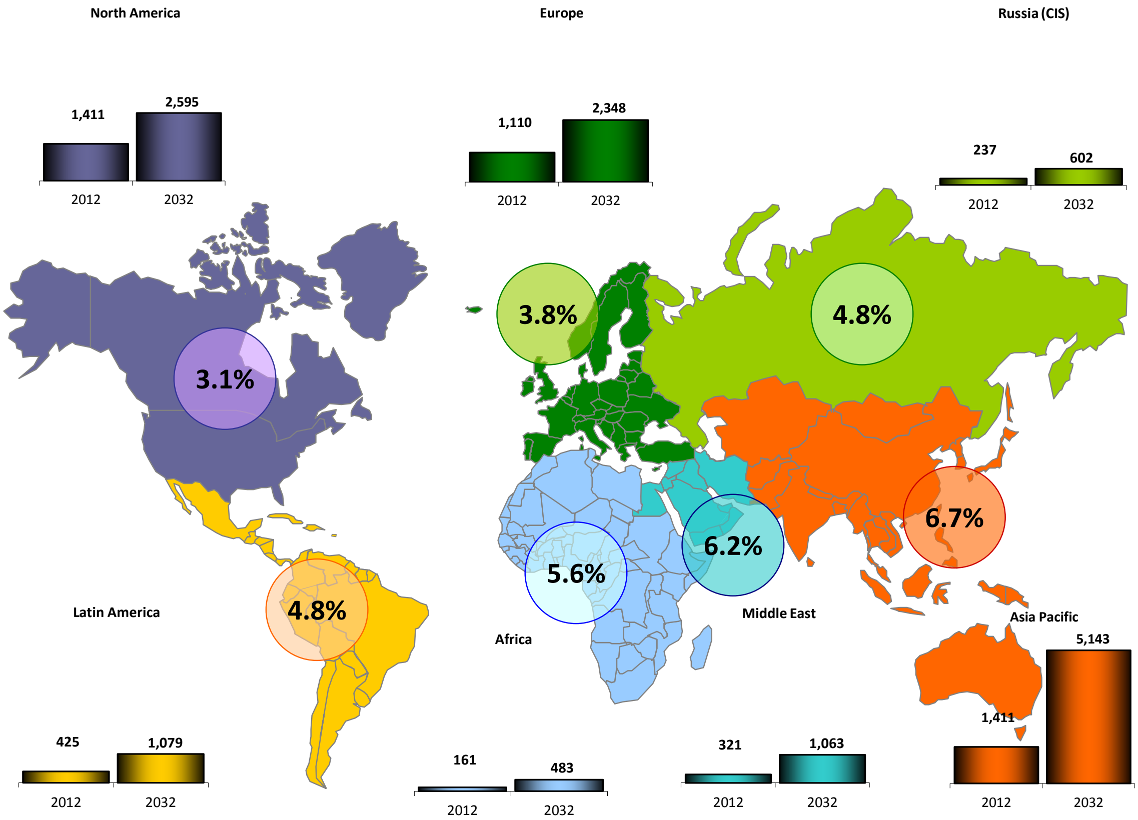
Source: Boeing, Airbus

Over the forecast period, growth in airline passenger traffic is geographically dispersed with regional variations displaying a close relationship with economic development. Figure 2.6 represents the RPK growth rates and absolute RPK growth within and to each region.

Similarly to its previous forecast, Boeing predicts that the Asia Pacific region will achieve the highest growth rate with an annual average RPK growth rate of 6.7%, followed by the Middle East (6.2%), Africa (5.6%) and South America (4.8%). These figures are broadly in line with the 2011 forecasts except for the downward review of the South American market (5.9% annual average growth rate in 2011). These emerging markets dominate the expected growth scenario compared to the more mature economies of Europe (3.8% in 2012, 4.4% in 2011) and North America (3.1% in 2012, 3.2% in 2011).

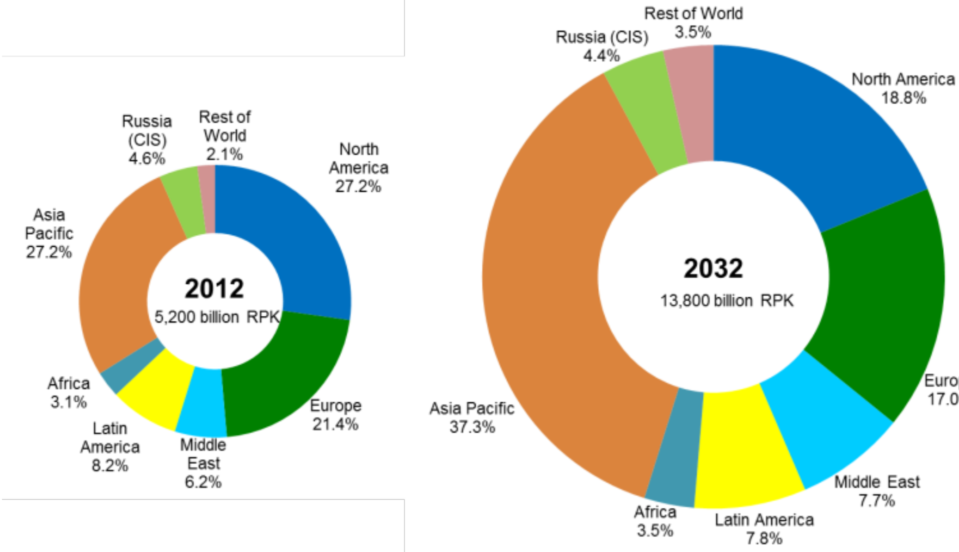
As shown in the charts in Figure 2.7, with the exception of Asia Pacific, the substantial growth trends in the aforementioned regions is not reflected in absolute terms as, combined, the three emerging regions are forecast to comprise 19% of global RPK volumes by 2032. In 2012 Asia Pacific, North America and Europe were the three largest markets and held a comparable market share, but by 2032 it is predicted that Asia Pacific will mature into being the prime region in terms of RPK. The 2032 cumulative North American and European RPK total share (35.8%) is forecast to be lower than Asia Pacific (37.3%) alone.

Figure 2.6: World Airline Traffic Growth (RPK billions and annual average growth rates) 2012-2032



Source: Boeing

Figure 2.7: Actual Market Share of Global Passenger Traffic (RPKs) in 2012 and 2032



Source: Boeing

2.4.3 Inter- and Intra-Regional Traffic Flow Growth

The Boeing Current Market Outlook provides a breakdown of inter- and intra-regional RPK forecast growth.

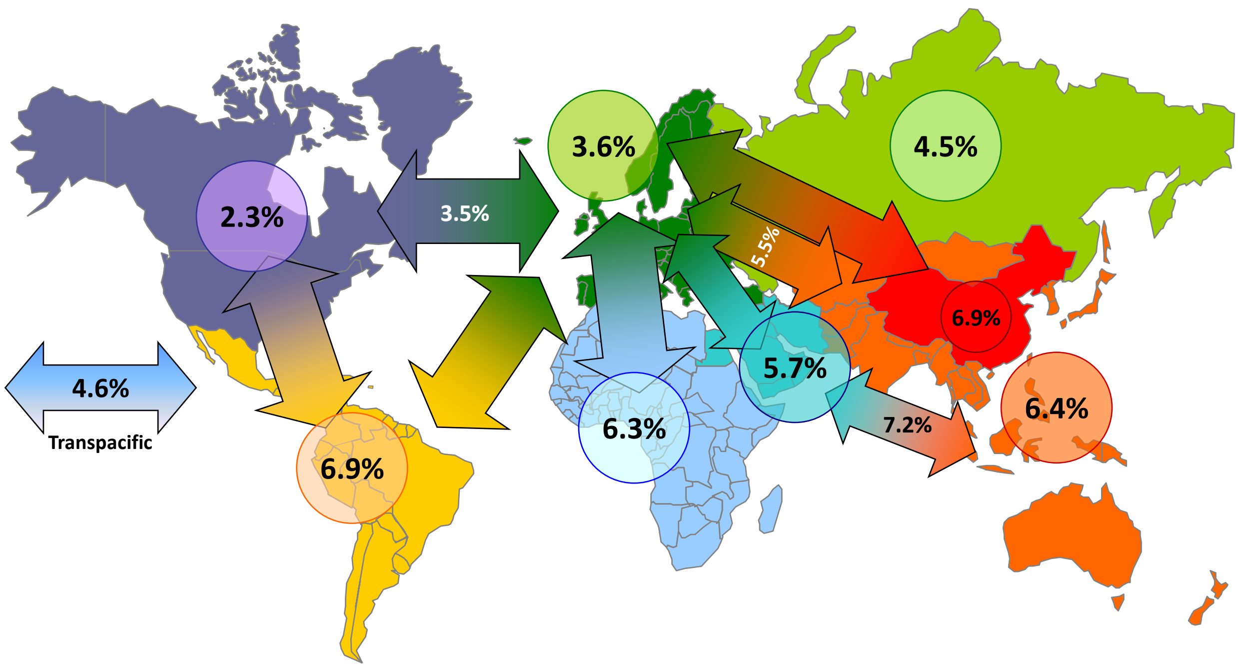
In Figure 2.8 a diagram of the major flows is presented. Within the circles is the expected intra-regional RPK growth between 2012 and 2032. The arrows indicate the percentage growth on inter-regional traffic flows.

The forecast growth in RPK in the next twenty years is concentrated in traffic to, from or within the Asia Pacific region (including China). When China is included in growth rates for traffic within Asia Pacific, the aggregate growth rate is 6.4%. However when China is measured separately, it accounts for a growth rate of 6.9%.

The lowest RPK growth is expected in the intra-North American market. The forecasted RPK growth is of 2.3%. The comparison of these figures with the previous Boeing market outlook indicates that most of the average annual growth rates are lower than those stated in the previous forecast. A relative growth in these rates is detected only for Latin America, Africa and Middle East regions.

In the previous Boeing forecast the highest RPK growth for inter-regional traffic flows was attributed to the Europe-China market, followed by the Middle East-Asia Pacific segment. However, as Figure 2.8 shows, the highest rate of forecast growth on inter-regional traffic flows is now predicted to be on Middle East-Asia Pacific routes (7.2% per year), reflecting the expected continued use of the Middle East for transfers between Europe/North America and Asia Pacific. Europe to China growth rates have fallen from 7.4% to 6.1% since the previous forecast.

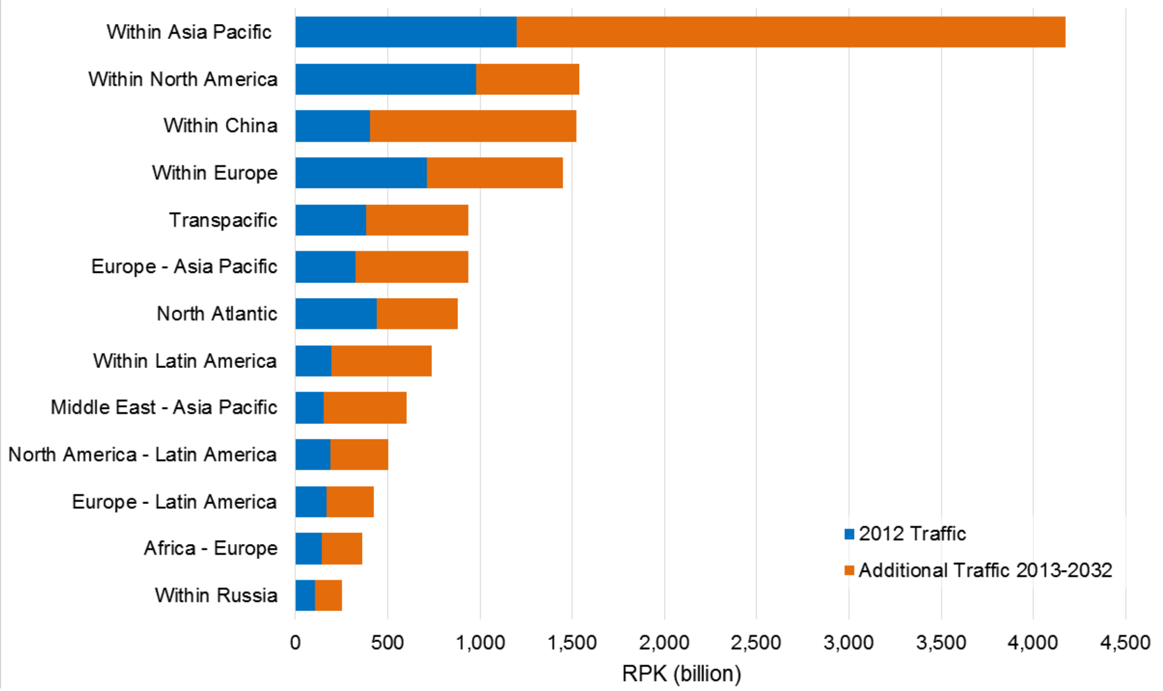
Figure 2.8: Intra & Inter-Regional RPK annual average growth rates 2012-2032



Source: Boeing

Figure 2.9 emphasises how the Asia Pacific area, in absolute RPK terms, is projected to retain leading market status in the future.

Figure 2.9: Intra & Inter-Regional Traffic RPKs 2012-2032



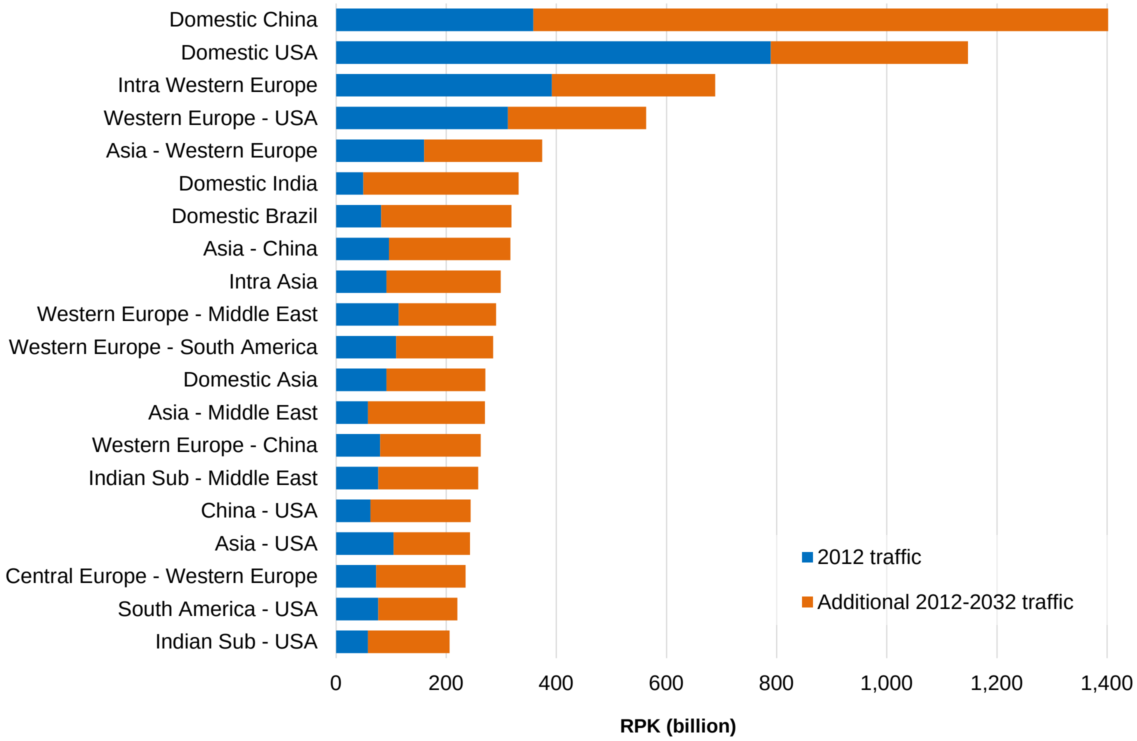
Source: Boeing

Regional Flows

In its latest Global Market Forecast for the period 2012 to 2032, Airbus has examined traffic flows and provided data for traffic routes at a detailed level. From this data the largest overall flows by volume can be determined.

In terms of the largest traffic flows in absolute volume, domestic China will overtake the domestic U.S. market. While experiencing growth rates below the world average over the forecast period, traffic flows within Western Europe and across the Atlantic remain the next two largest passenger markets (Figure 2.10).

Figure 2.10: Largest 20 Traffic Flows in 2032



Source: Airbus

2.4.4 Trends in Europe

As illustrated in Figure 2.6 it is projected that in Europe passenger traffic will rise at an annual rate of 3.8% to 2032, reaching 2.35 trillion RPK. This is a downward revision of the European market which, in the previous forecast, was estimated to grow to 2.88 trillion in 2030. This decrease is largely due to the performance of the aviation market in the base years; 1.22 trillion RPK in 2010 in contrast to 1.11 trillion RPK in 2012. The core reason for the under-performance is the effect of the economic downturn that has impacted the European region since 2008/2009. The IHS Global Insight GDP forecast for Europe for the years 2012 to 2032 estimate a 2% annual increase against 1.9% projected between 2010 and 2030, thus showing increasing confidence in improving economic conditions going forward.

2.5 EUROCONTROL Flight Movement Forecasts

The STATFOR (Statistics and Forecasting) section of EUROCONTROL regularly produces short, medium and long term flight movement forecasts for European airspace.

It should be noted that EUROCONTROL's forecasts produce outputs as measured by air transport movements, or more specifically, IFR movements. Aircraft operating under instrument flight rules (IFR) are those flying in controlled airspace under regulations and procedures which allow the flight crew to navigate solely by reference to cockpit instruments and radio navigation aids.

The vast majority of commercial passenger and cargo air transport flights operate using an IFR flight plan. However, there are many other types of flights operating under IFR in Europe which cannot be typically characterised as commercial airline services, such as business jets, military transport, training flights and some light aircraft (General Aviation) flights.

Using IFR movements as a measurement of aviation activity provides a useful overview from an operational standpoint. Rather than measuring absolute numbers of passengers or RPK, examining IFR movements allows for the analysis of overall aircraft operational activity within European airspace, therefore helping to determine its pressures, demands, capacity and constraints. This in turn is useful for planning improvements and efficiencies in the aviation system; essential for projects such as SESAR, Clean Sky JTI, the Emissions Trading Scheme and airport infrastructure and capacity. The forecasts do not however consider aircraft size, or average numbers of passengers per flight.

2.5.1 The Short Term Forecast

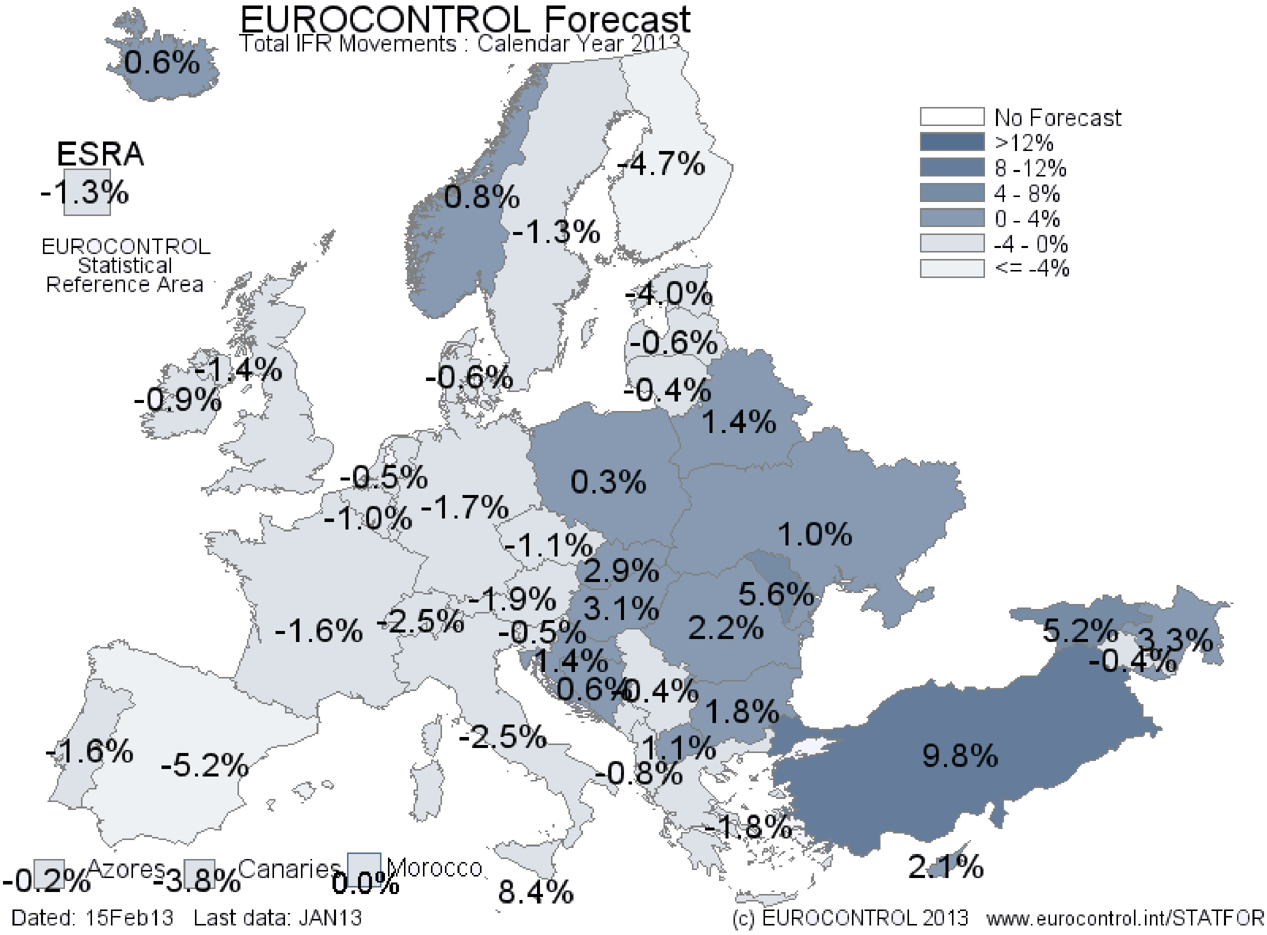
A EUROCONTROL state-level forecast for 2013 is shown in Figure 2.11 According to this base case scenario there will exist a two-speed growth picture where much of Western Europe experiences a decline in IFR movements and much of Eastern Europe sees growth in 2013. In total, the number of European flights is expected to decrease by 1.3% in 2013. Due to the cut in economic growth (-0.5%) and the recent weak traffic trends, almost all states have seen their forecasts revised downwards compared to those of September 2012.

Statistics by state for 2014 are presented in Figure 2.12, showing a positive rebound in traffic in all west European states and continued growth in Eastern Europe.

This short-term forecast is influenced by a number of factors and events:

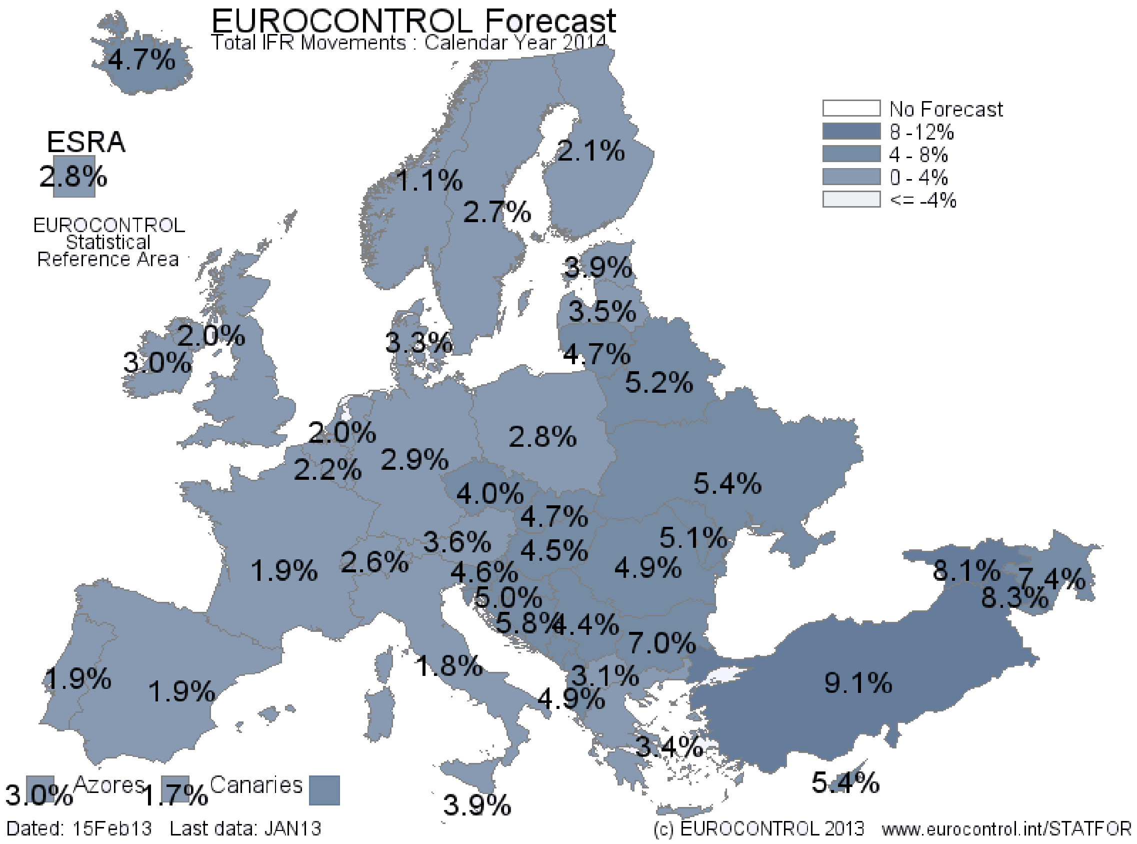
- Current uncertainty surrounding the Eurozone economy.
- Possibility of further airline failure. For example, LOT Polish Airlines is expected to reduce by about a third its fleet in 2013 while Ukrainian AeroSvit has ceased operations in early 2013. The consequent traffic cuts are expected to be significant.
- Continued growth in Turkey, due largely to its strong domestic traffic and development of traffic from the Middle East, North Africa and Russia and due to the fleet expansion of Turkish carriers.

Figure 2.11: States forecast detail for 2013



Source: EUROCONTROL

Figure 2.12: States forecast detail for 2014



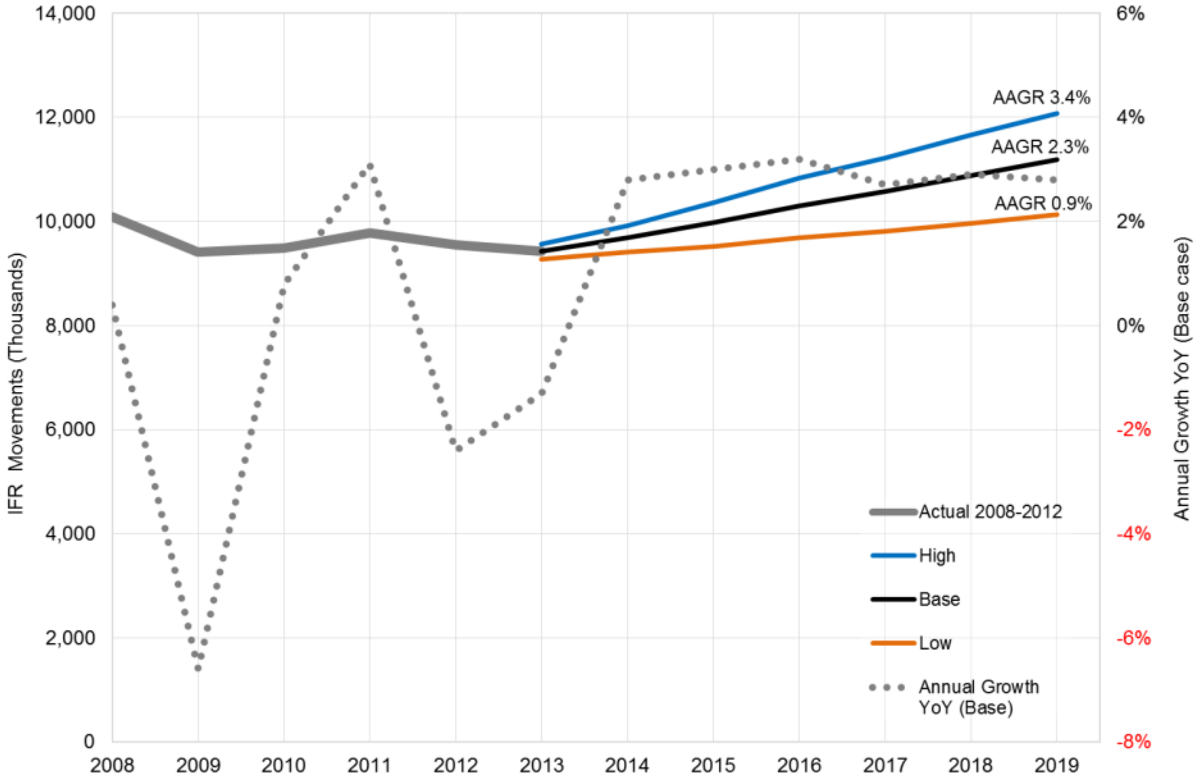
Source: EUROCONTROL

2.5.2 The Medium Term Forecast

IFR movements in Europe, forecast by EUROCONTROL, are estimated to reach 11.2 million in 2019. This figure is 17% more than in 2012. The weakness of the economic situation in Europe and the financial difficulties of carriers are reflected as in the first year of the forecast a decline of 1.3% is predicted (whereas the low case scenario would see a decline of 2.9% in 2013). For the years between 2014 and 2019 growth is expected to recover to 2.9% per year. However, the 2008 peak of 10.1 million flights is now expected to be overtaken only in 2016. In its previous forecast (September 2012) EUROCONTROL expected that this threshold would be achieved in 2015; therefore it is indicating a slower rebound of traffic in the region, with an annualised growth rate of 2.3% expected between 2013 and 2019.

As noted above, EUROCONTROL has also produced high and low traffic growth scenarios which differ in terms of methodology and input assumptions. The most probable scenario of future growth in flight movements is designated by the base case, between the high and low cases. As illustrated in Figure 2.13, in 2019 for the low case 10.1 million movements are forecast, a level expected to be achieved by 2016 in the base case. In the high case, 12.1 million movements are forecast by 2019, with an average annual growth rate of 3.4%, compared to 0.9% in the low case.

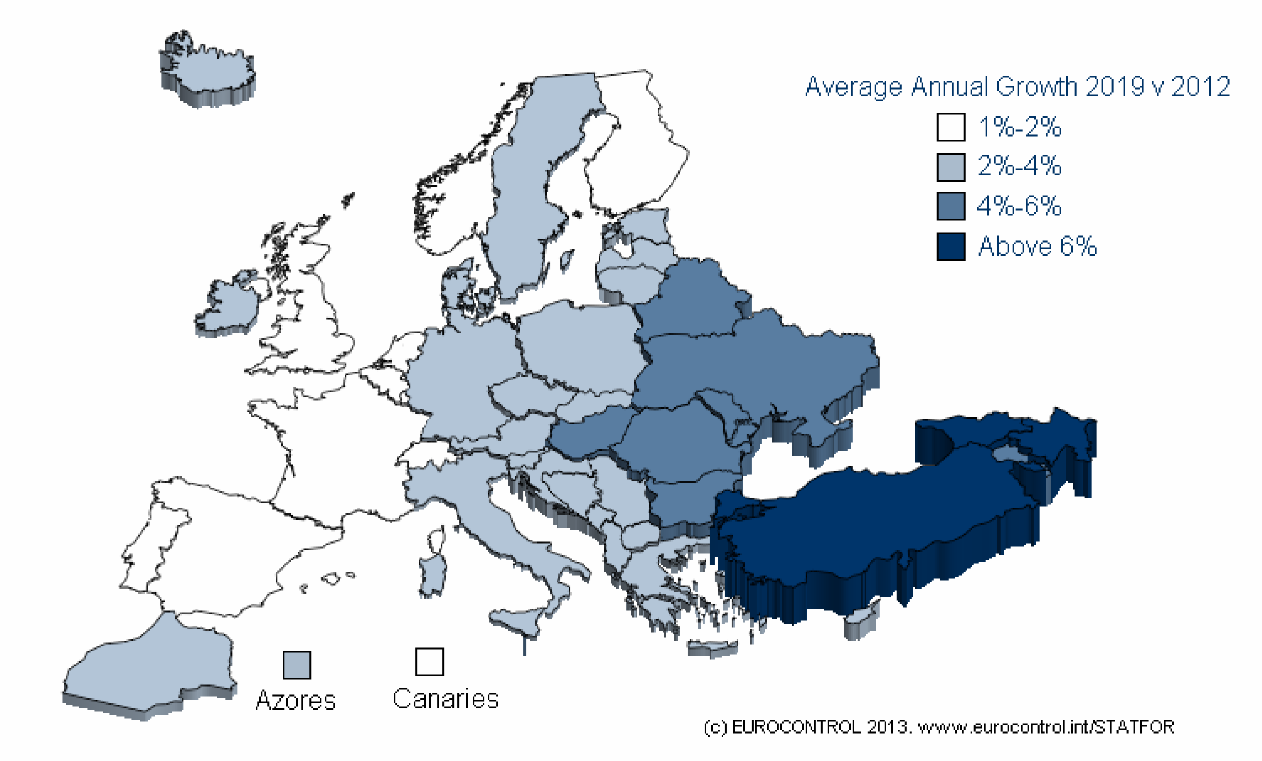
Figure 2.13: EUROCONTROL Medium Term Forecast 2013-2019



Source: EUROCONTROL

After 2017 traffic growth will slow, mainly due to airport capacity constraints at the larger hubs becoming an issue. As shown in Figure 2.14, similar to the short term forecast, growth will not be uniform across European states. Stronger growth is again expected in the East, where markets are less mature than the Western part of Europe.

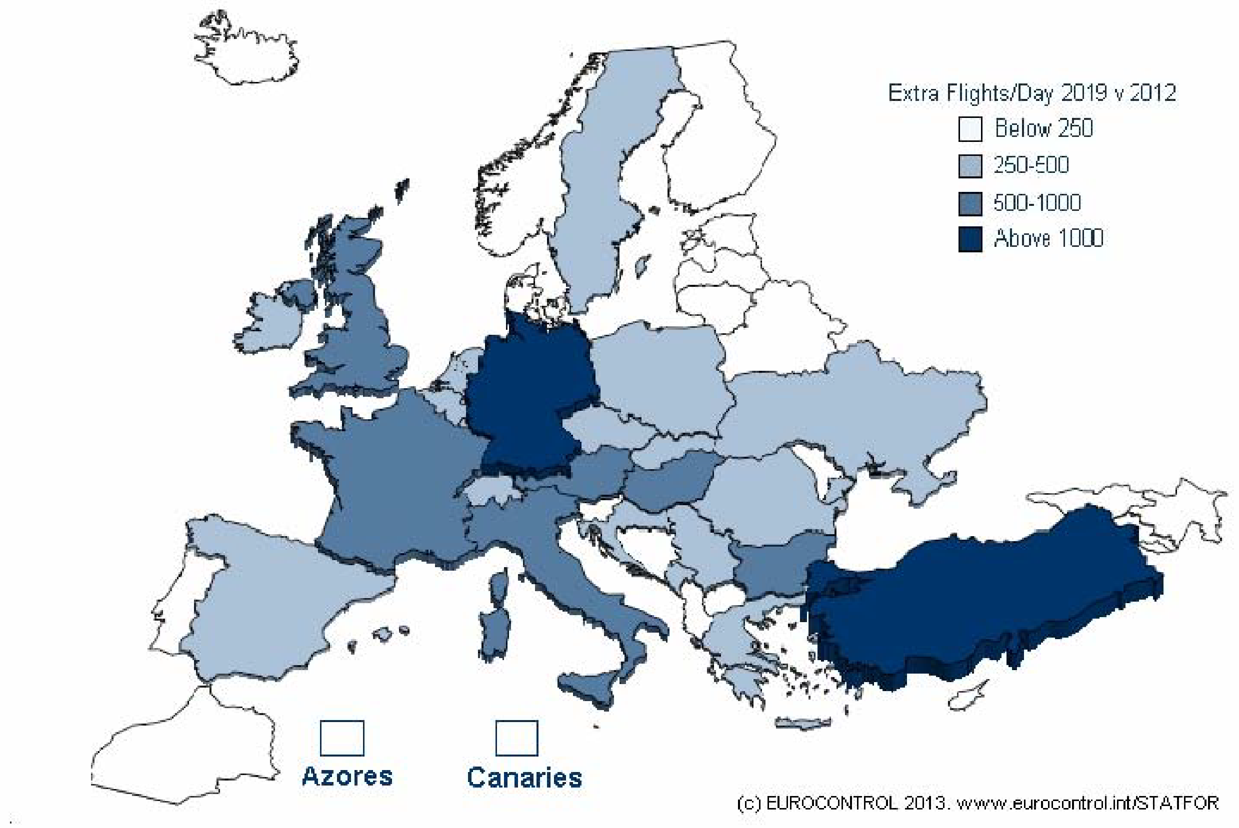
Figure 2.14: Average Annual Growth 2012-2019 by State



Source: EUROCONTROL

Germany, even though not being one of the fastest growing countries, will be alongside Turkey as the main contributor to total growth between 2012 and 2019, adding an expected 1,000 extra flights per day by the end of that period. Turkey will remain the fastest growing EUROCONTROL country, and it is estimated that Turkish domestic flows will be those adding the most flights over the next seven years. Figure 2.15 shows the absolute change in movements between 2012 and 2019.

Figure 2.15: Absolute Growth 2019 v 2012 by State



Source: EUROCONTROL

Airport capacity constraints are one of the cited causes that will restrain flight growth rates. According to the EUROCONTROL forecast, demand for about 135,000 flights will not be accommodated by 2019, causing a 1.2% reduction in growth over 2012-2019.

Expansion of the high-speed rail network will reduce flight growth by 0.4% over the next seven years, as the improvement in train journey times leads to increased competition with air travel and a consequent likely reduction in the shorthaul air network where high speed rail competes with air services directly. Over the entire network this figure is relatively insignificant, but on specific city-pairs this substitution effect has a greater impact, especially at the end of the forecast horizon. The largest impacts are expected to be in Germany and Turkey, where the high speed rail lines Nürnberg-Berlin and Frankfurt-Stuttgart (Germany), and Istanbul-Ankara-Sivas and Istanbul-Konya (Turkey) will likely have a negative impact on air transport demand.

2.5.3 The Long Term Forecast

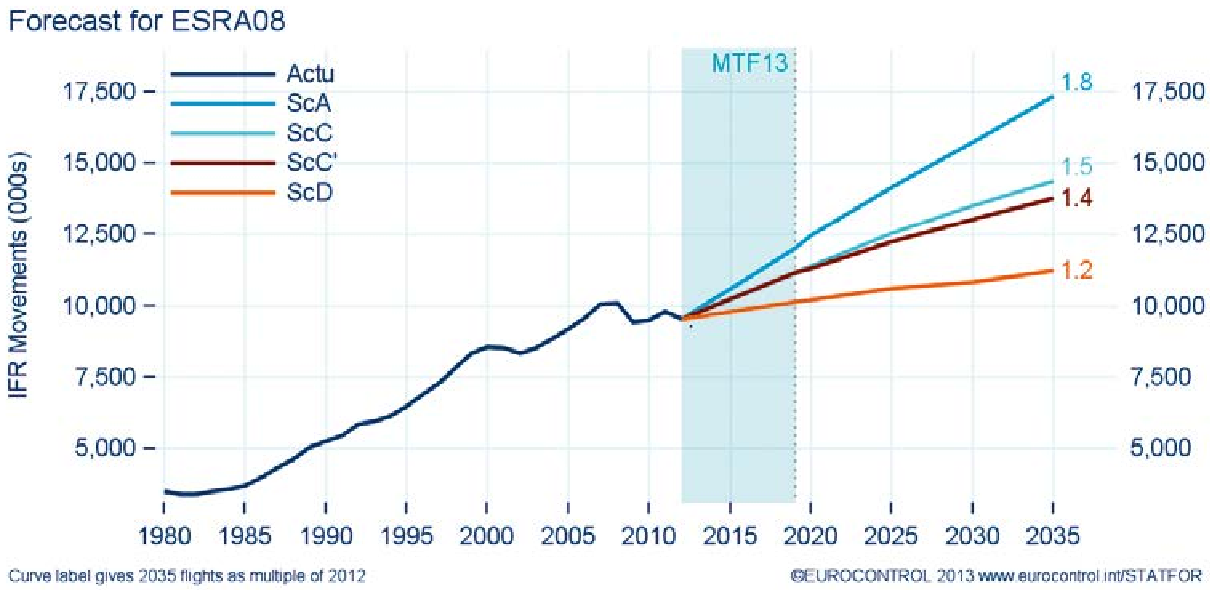
EUROCONTROL has produced a 2013 update of the 20-year forecast of IFR flight movements in Europe, reporting the predicted traffic at European airports between 2012 and 2035. Additionally, in 2013

EUROCONTROL has published the first forecast of IFR flight movements in Europe up to 2050. In this section both forecasts are reviewed.

EUROCONTROL long-term forecast focuses on traffic developments after 2019 (the end of the 7-year forecast described in subsection 0. Four possible scenarios were constructed, each considering a different outlook. The scenarios vary in their input assumptions, leading to different forecast volumes of traffic and patterns of growth.

- Scenario A: Global Growth – strong economic growth and high technological growth
- Scenario C: Regulated Growth – moderate economic growth with regulation addressing the growing global sustainability concerns.
- Scenario C': Happy Localism – weak economic growth. Based on scenario C but investigating an alternative path for the future where air travel in Europe would take an "inward perspective".
- Scenario D: Fragmenting World – very weak economic growth – increasing political tension, security threats and reduced trade.

Figure 2.16: Growth patterns for the four scenarios. Curve labels give 2035 flights as a multiple of 2012



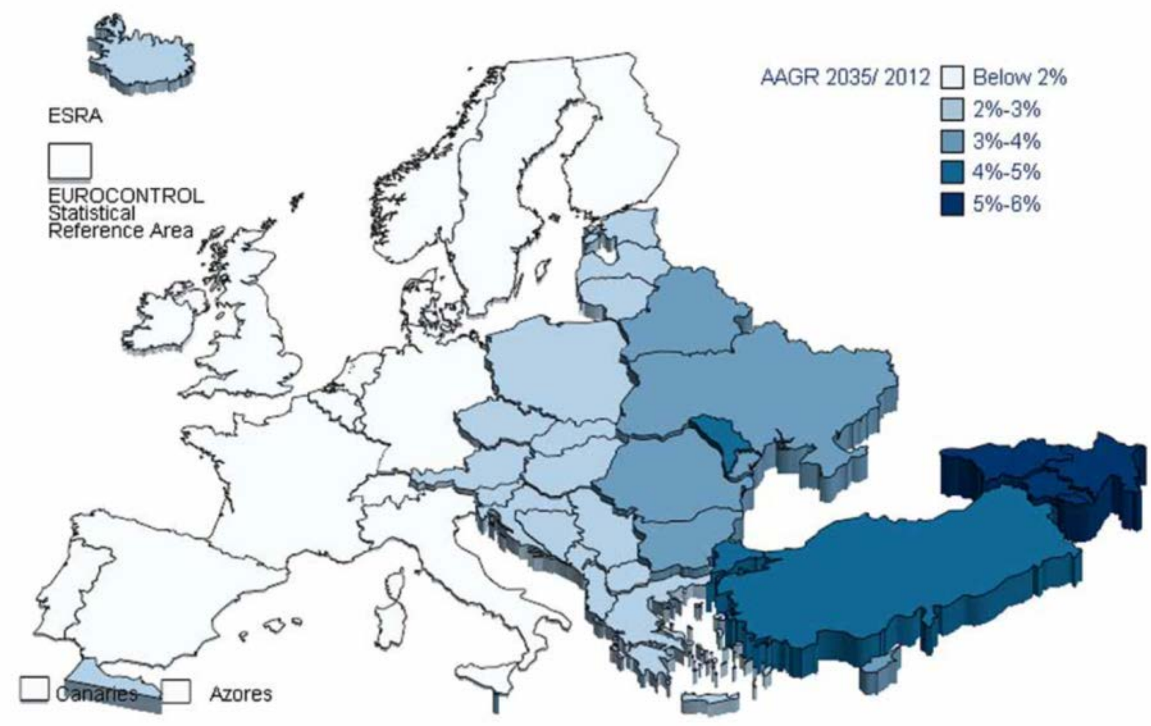
Source: EUROCONTROL

ScA = Scenario A, ScC = Scenario C, ScC' = Scenario C', ScD = Scenario D

As illustrated in Figure 2.16 the scenarios show significantly different growth patterns: predictions of traffic volumes in 2035 range between 11.2 and 17.3 million IFR flight movements.

Scenario C has been constructed as the “most-likely” scenario, the one that most closely follows the current trends. According to EUROCONTROL under this case there will be 14.4 million IFR movements in Europe in 2035, 1.5 times more than in 2012. It is worth noting that in the previous 2010 forecast this same scenario estimated 16.9 million movements in 2030. The starting point of the 2012 forecast is lower than in the 2010 forecast, due to the economic downturn in Europe. Moreover, due to the weaker economic outlook and the projected reduced airport capacity, the rate of growth is lower than the one calculated in the previous forecast. The forecast average growth over the period is 1.8% per year (2.8% in the previous forecast) but it will be faster in the early years, stronger in Eastern Europe (as shown in Figure 2.17) and stronger for arrivals and departures ex-Europe than for intra-European flights.

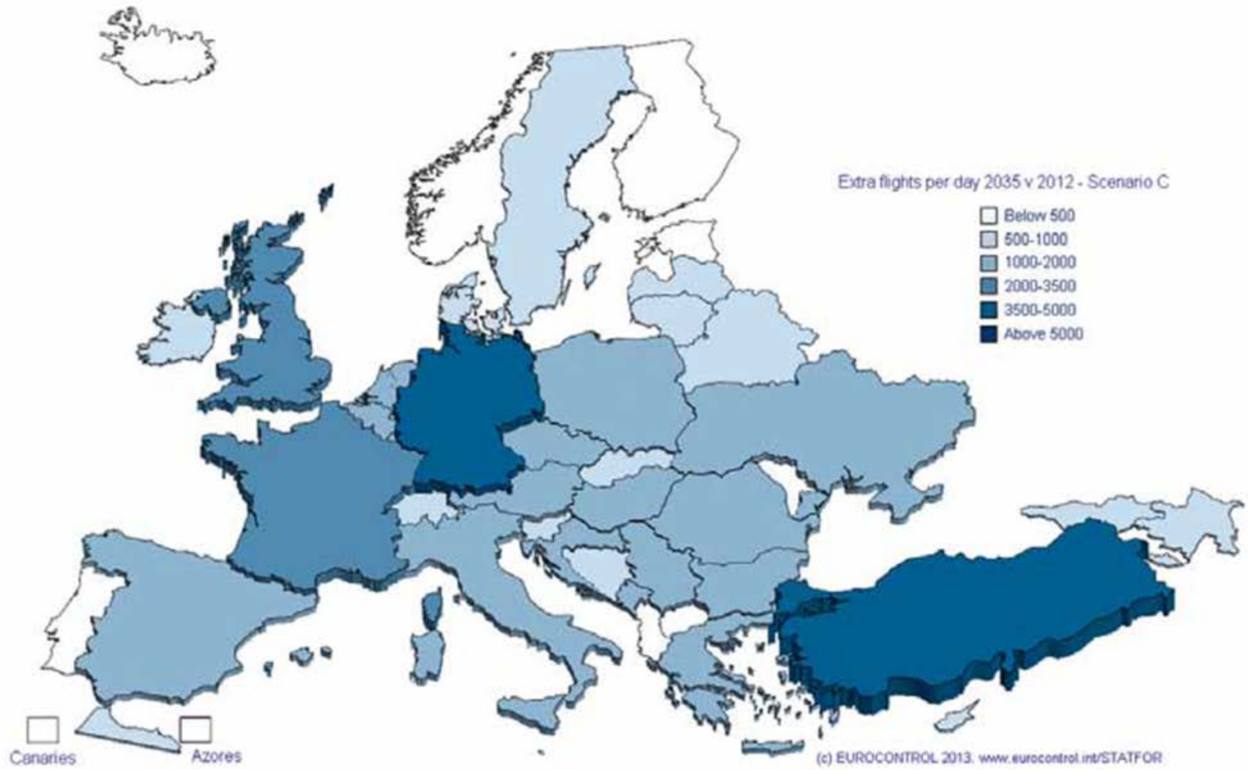
Figure 2.17: Average annual growth 2035 v 2012 by State – Most likely scenario (C)



Source: EUROCONTROL

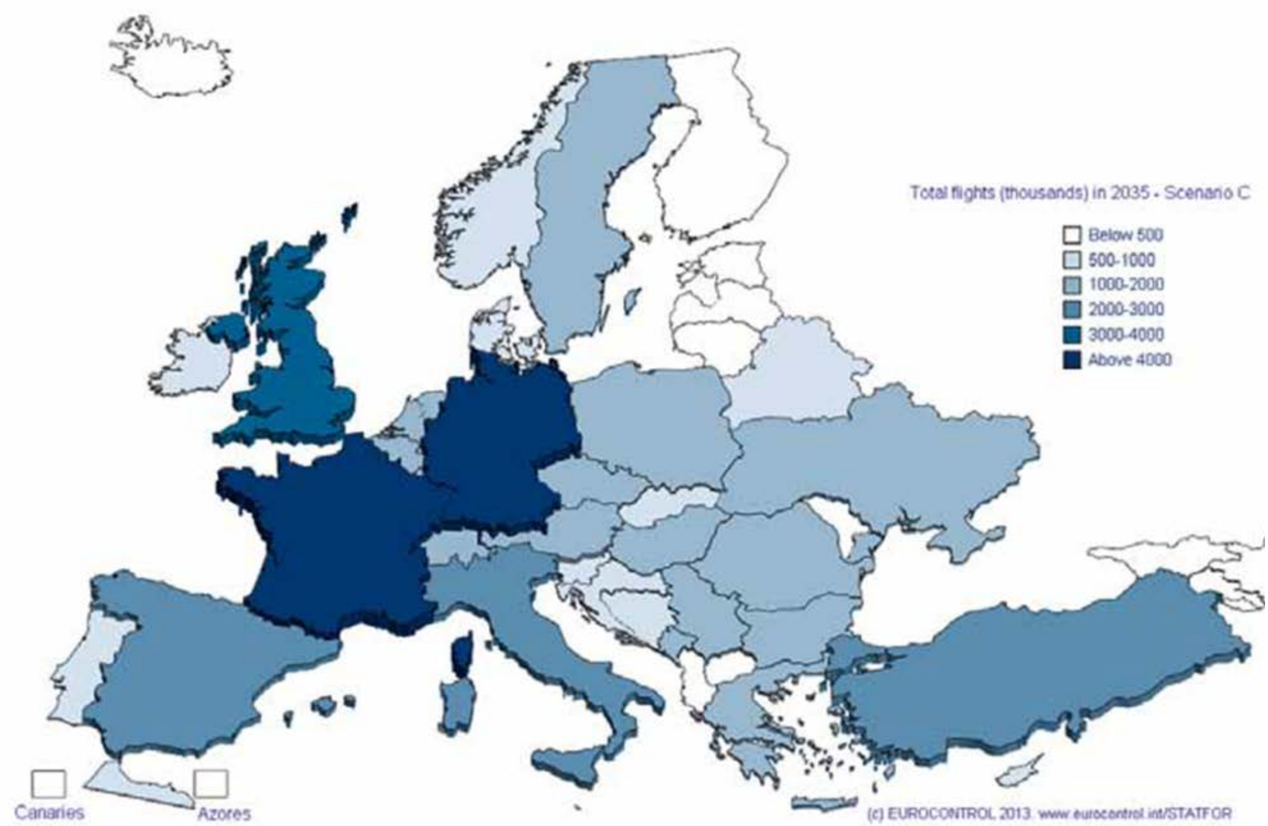
As illustrated in Figure 2.18 and Figure 2.19, even though growth is expected to be faster in Eastern Europe, the greatest increase in the number of flights in absolute terms will be in the mature air transport markets of Western Europe.

Figure 2.18: Absolute Growth 2035 v 2012 by State – Most likely scenario (C)



Source: EUROCONTROL

Figure 2.19: Total flights (thousands) in 2035 by State – Most likely scenario (C)



Source: EUROCONTROL

As noted previously, air traffic growth in Europe is forecast to be constrained by available capacity at airports. In the most-likely scenario the measure of unaccommodated demand in 2035 is about 1.9 million IFR flights, corresponding to 12% of European demand in 2035. This figure is of a similar magnitude to the excess demand presented in the previous 2010 forecast for 2030. According to EUROCONTROL when capacity limits are reached, congestion at airports will rapidly increase and spread across the airports, leading to additional pressure on the system and consequently impact on flight punctuality. In Table 2.3 the unaccommodated IFR flights demand is presented for each of the four scenarios.

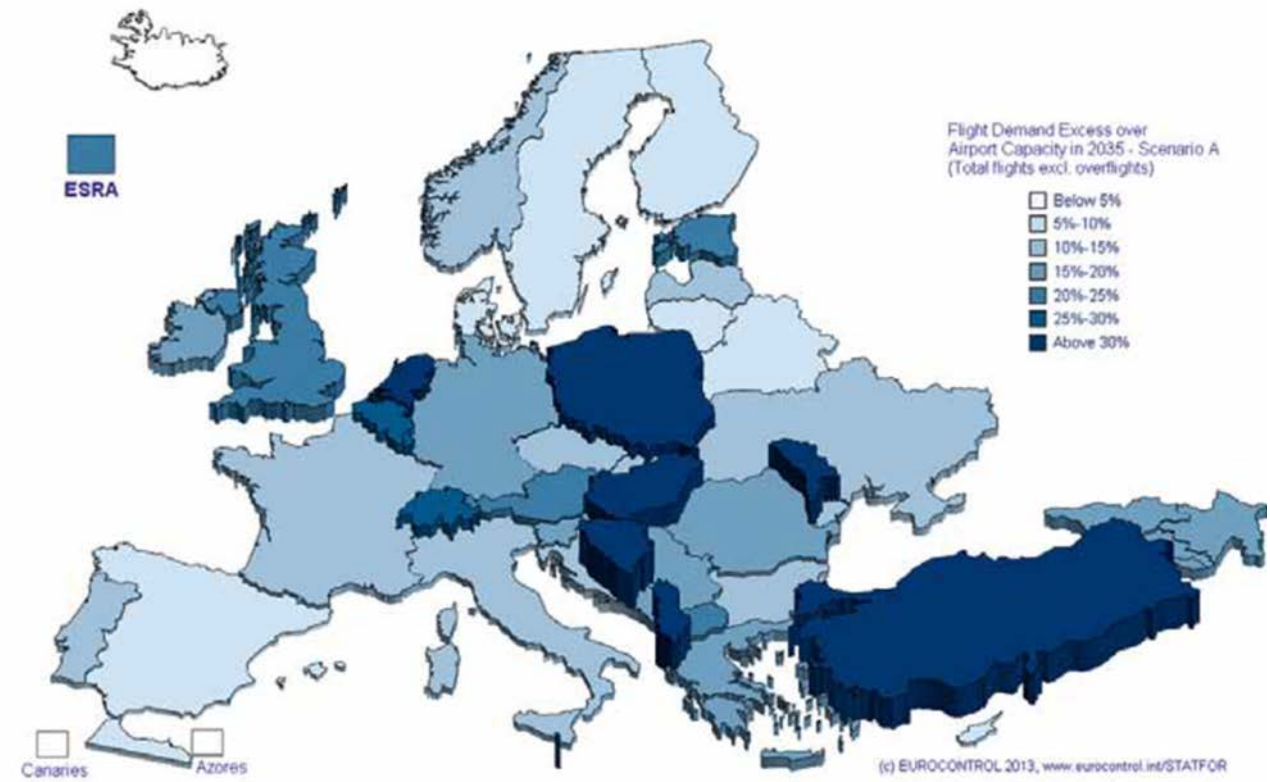
Table 2.3: Unaccommodated IFR Flights

	Unaccommodated IFR Flights (million)				Unaccommodated demand (%)			
	2020	2025	2030	2035	2020	2025	2030	2035
A: Global Growth	0.4	1.3	2.3	4.4	3%	8%	13%	20%
C: Regulated Growth	0.2	0.5	1.2	1.9	1%	4%	8%	12%
C': Happy Localism	0.1	0.3	0.6	1.0	1%	2%	5%	7%
D: Fragmenting World	0.0	0.1	0.1	0.2	0%	1%	1%	2%

Source: EUROCONTROL

In the fastest growing scenario (A: Global Growth) it is estimated that 4.4 million flights are going to be lost due to limitations in airport capacity in 2035. This figure corresponds to 20% of the unconstrained demand for that year. As shown in Figure 2.20 the disparity between capacity and demand varies between European countries. In the most likely scenario, Turkey will find over 30% of its flight demand unaccommodated in 2035. Other Eastern Europe states such as Bulgaria, Hungary and Romania are forecast to have around 17% to 22% excess of demand. It should be noted that these figures represent an indication of the expected trends and therefore are not definitive as, for example, new development projects may be launched and operations can be further optimised in order to increase the number of flights with the existing infrastructure.

Figure 2.20: Demand excess for total flights excluding overflights in 2035 by State – Scenario A (Global Growth)



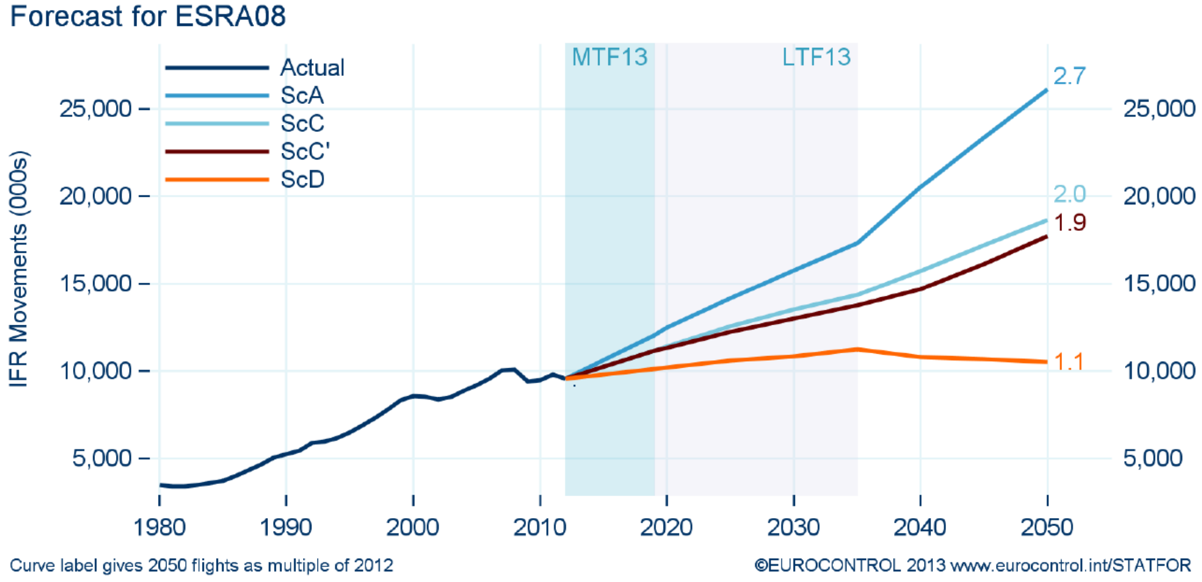
Source: EUROCONTROL

EUROCONTROL's first forecast of IFR flight movements in Europe up to 2050 focuses on the developments after 2035, which are discussed above. Similarly to the aforementioned long-term forecast, the 2050 projections consider four different scenarios, defined as in its 20-year forecast. Figure 2.21 shows the constrained growth rates for the four scenarios. According to EUROCONTROL, unlike for the 20-year forecast there is no "most likely" scenario identified, due to the extended time horizon analysed, and the uncertainty surrounding ultra-long term forecast assumptions.

Across all scenarios some trends are evident:

- The major growth will be in flights into/out of the region (including overflights). Intra-regional flights will decline as a percentage of the total forecast traffic (whilst still being the dominant flow).
- North-West Europe will remain the region with the highest total IFR movements while Eastern Europe will see the highest growth in flights by 2050. Flows between North-West Europe and North Atlantic will drop out of the “Top 10” flows, with flows from Eastern and Southern Europe to Other parts of Europe (CIS and Russia) replacing it.
- Intra- Northwest European flows will remain the top flow for all scenarios.
- The most significant growth will come from Southern and Eastern Europe, in particular international flows to North Africa and Asia Pacific.
- There is a trend to an increasing proportion of medium- to long-haul flights.
- In all scenarios there is unaccommodated demand by 2050, with the majority of this unsatisfied demand in Southern Europe.

Figure 2.21: Constrained forecast for 2050 (Combined with 2012-2019 and 2019-2035 forecast). Curve labels give 2050 flights as a multiple of 2012 for each scenario.

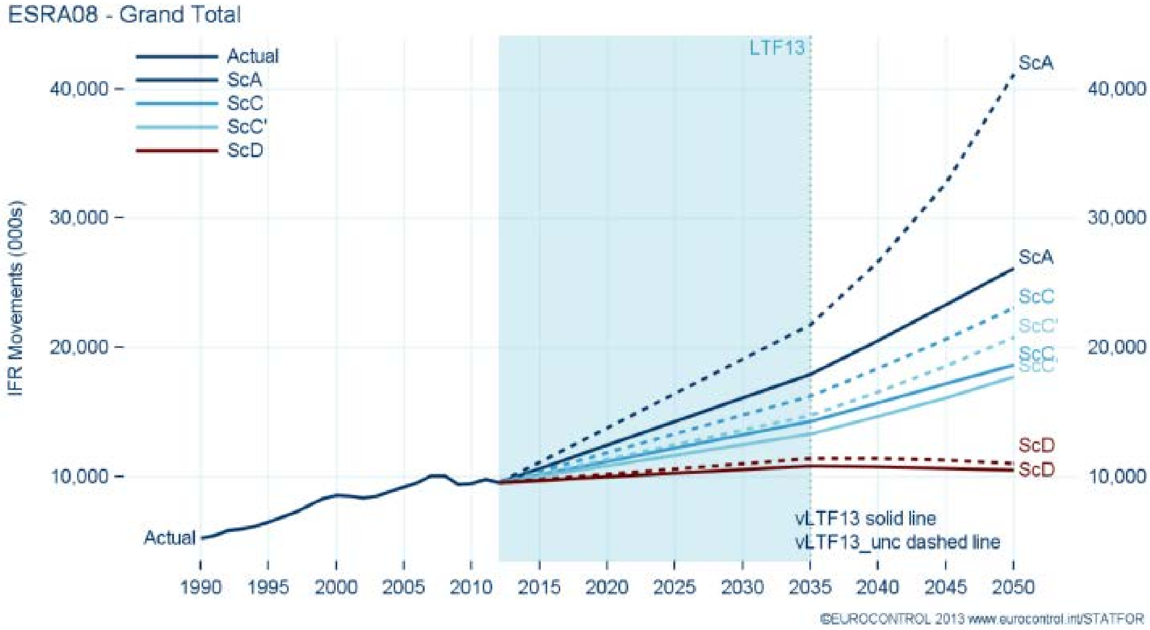


Source: EUROCONTROL

ScA = Scenario A, ScC = Scenario C, ScC’ = Scenario C’, ScD = Scenario D

Figure 2.22 shows the comparison of the unconstrained forecast with the constrained forecast. The unconstrained forecast represents the unaccommodated demand: the difference between demand for air travel and the flights that can be accommodated at given airports. To achieve this EUROCONTROL assumed airports' long term capacities. For all scenarios, in 2050 it is expected that the majority of the unaccommodated demand is in the Mediterranean area whilst other European regions exhibit significant capacity constraints.

Figure 2.22: Comparison of unconstrained forecast for 2050 (dashed lines) and constrained forecast (solid lines)



Source: EUROCONTROL

ScA = Scenario A, ScC = Scenario C, ScC' = Scenario C', ScD = Scenario D

2.6 World Air Cargo Forecast

Boeing produces the most complete long term forecast for global air cargo over the next 20 years, which is updated bi-annually, with the latest October 2012 review examined in the previous Annual Analyses of the EU Air Transport Market. However, in its annual Global Market Outlook Boeing briefly reports the key indicator outlook on cargo for the next twenty years. Air cargo traffic is measured in Revenue Tonne-Kilometres (RTKs), which is the amount of cargo carried multiplied by the distance it is transported.

Boeing forecasts an average annual growth in RTKs of 5% between 2012 and 2032, identical to the air transport passengers' average annual growth in terms of RPK projected over the same period. This is mainly due to global GDP and world trade recovering to their historic growth levels.

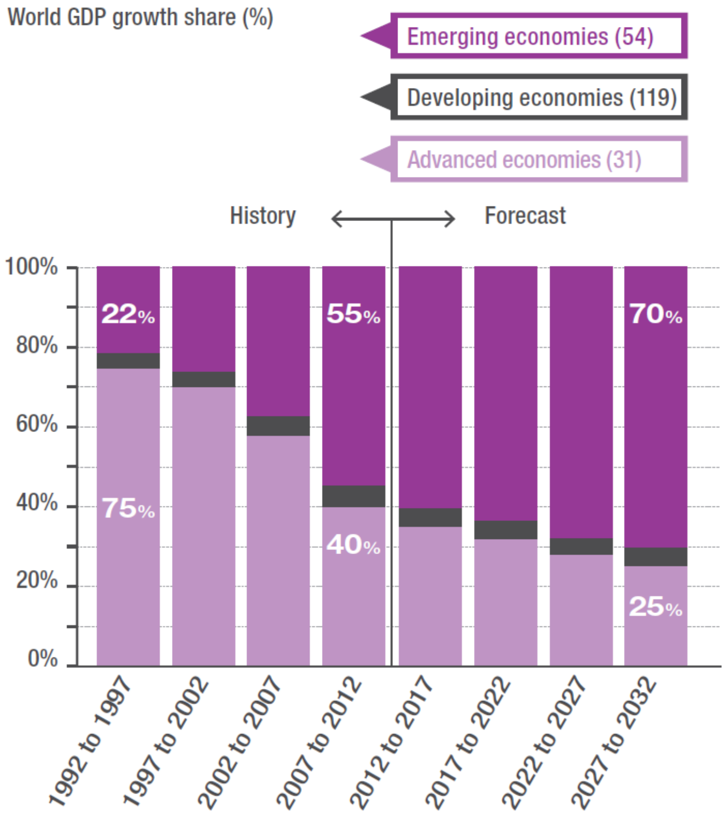
Airbus has also produced a current freight forecast[12] for 2013-2032. When considering drivers of demand for air cargo, the European aircraft manufacture notes that there is a high correlation between macro-economic drivers and the success of the air freight market. In particular, several of the most important economic drivers are:

- Economic activity
- World trade
- Private consumption
- Industrial production

Airbus suggests that, similar to the economy, much of the growth in the general air freight market is being driven by emerging markets. However, it also notes that within the struggling mature markets, economic growth is expected to return in late 2013 which will help spur the air freight market.

Figure 2.23 illustrates the distribution and share of world GDP growth, reinforcing where the expected growth in air freight demand will be focused in the future. The emerging economies will account for an ever-increasing share of global GDP growth, and thus it is projected that these areas will drive global air freight demand growth.

Figure 2.23: World GDP growth share (%)



Source: Airbus Global Market Forecast – Future Payloads; Freight Forecast 2013-2032

[12] Airbus Global Market Forecast – Future Payloads; Freight Forecast 2013-2032

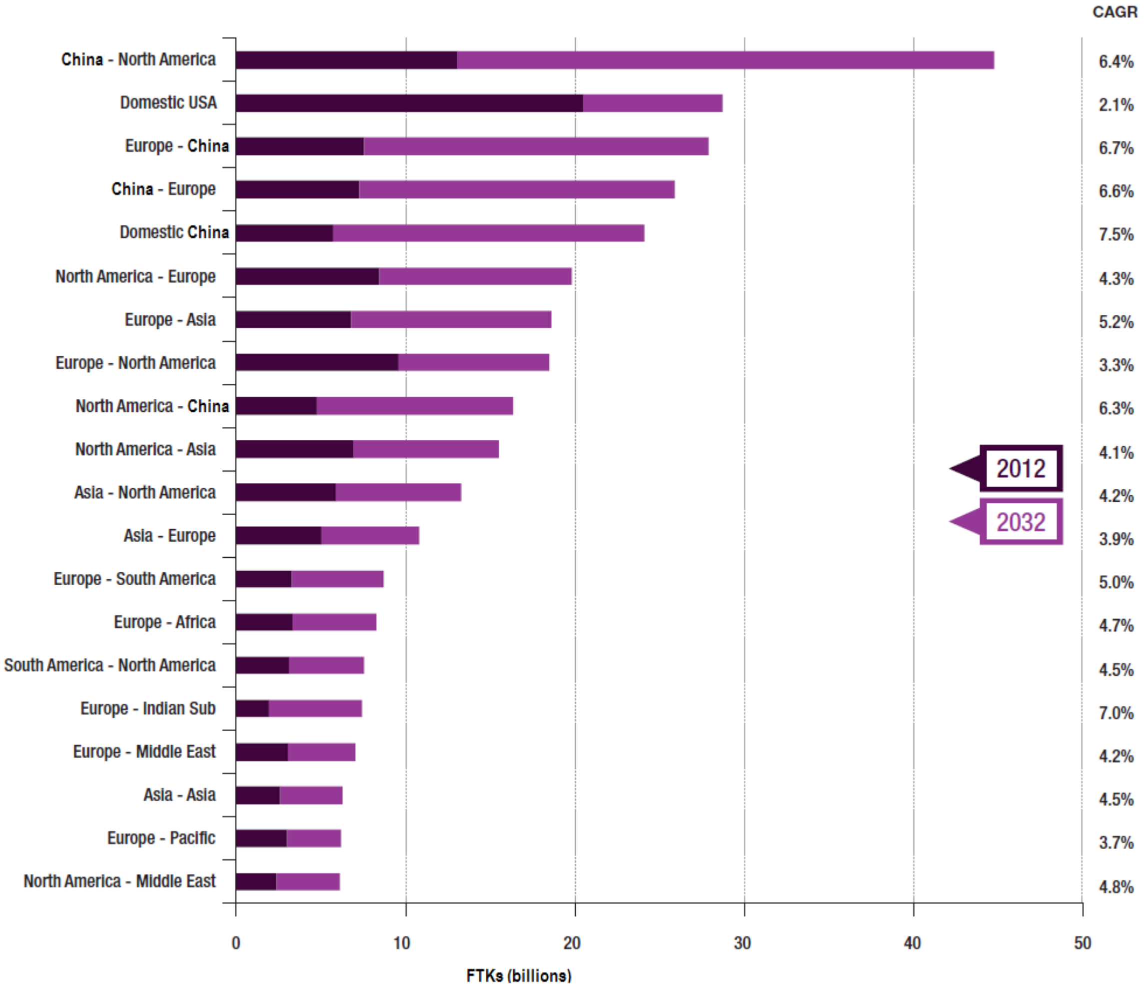
Focusing on air cargo traffic growth, Airbus forecasts an annual average growth rate in FTKs (Freight Tonne-Kilometres) of 4.8% out to from 2013 to 2032.

In 2012, Asia Pacific (including China and India) represents 36% of the world air freight traffic and is forecast to grow to 42% by 2032.

Airbus recognises that the Europe/CIS region and North America combined accounted for 51% of global air freight traffic in 2012, but its market share will reduce to 45% by 2032, such is the growth expected in other markets. China is the largest driver of air cargo growth, representing 15% in 2012 and rising to a global market share of 22% by 2032.

The importance of China is further reflected in Figure 2.24, where we see four of the top five global air freight flows forecast to involve the country. With an average annual growth rate of 6.4% between 2013 and 2032, China-North America is forecast to be the dominant air freight traffic flow in the next twenty years, while the highest growth rate (CAGR 7.5%) is reserved for the Chinese domestic market.

Figure 2.24: Top 20 Largest Air Freight Traffic Flows in 2032



Source: Airbus Global Market Forecast – Future Payloads; Freight Forecast 2013-2032

3. Airlines

3.1 Overview

2012 saw continued growth in the World Air Transport market. IATA recorded growth of 5.3% of Revenue Passenger Kilometres (RPK) compared to 2011.

With an industry average of 79.1%, passenger load factors were 1% higher than in 2011, a result of the growth in RPKs remaining above growth in Available Seat Kilometres (ASKs) as airlines kept tighter control over the available capacity in the markets. Load factors for 2012 were above the corresponding months of 2011 for all but July where no change was recorded. As expected, PLF's were not uniform throughout the year, with the Northern Hemisphere Summer witnessing the highest load factors.

As is becoming a trend, the cost of jet fuel remained a key concern for airlines in protecting profitability in 2012. Jet fuel prices were volatile during the year with a marked drop during Spring, before prices recovered in August to the level seen at the start of the year.

Air Fares were at a lower level in 2012 compared to 2011, partially as a result of the slightly reduced fuel costs in the early part of the year.

In 2012, industry-wide net profits of some US$ 7.4 billion are marginally lower than those recorded in 2011, but this still represents a reasonable outcome when compared against recent historical results. The core reason for the dip in net profits in 2012 is that again, the rise in expenses (7.0% year-on-year) outstripped that of revenues (6.9%), with high fuel costs the main contributory factor accounting for 32% of total costs in 2012 although Non-fuel expenses also continued to rise.

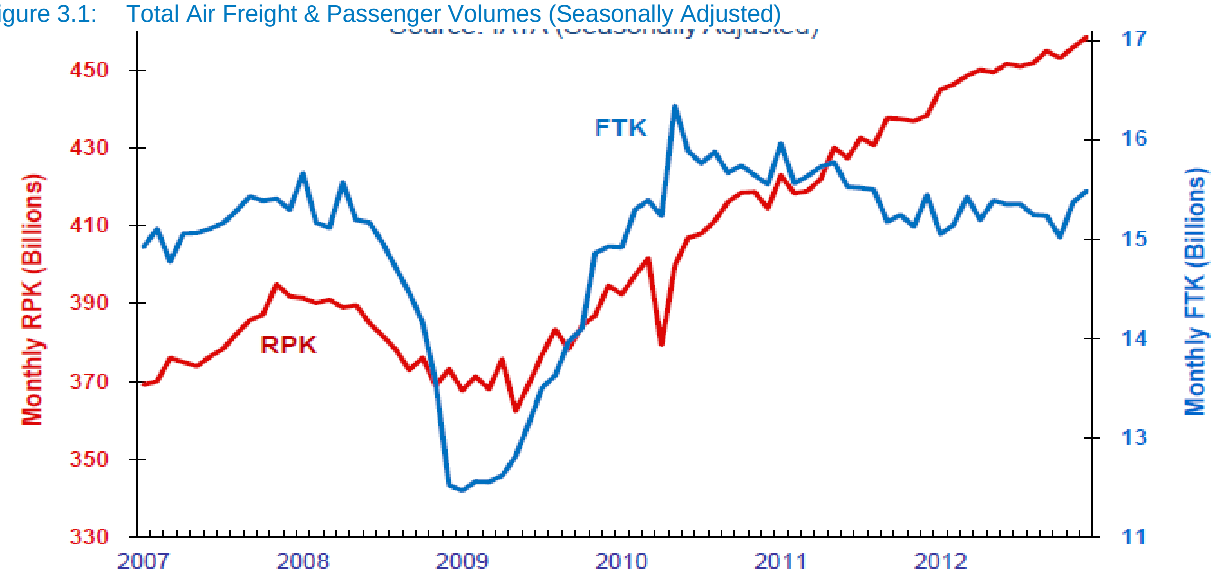
Of the European airline failures in 2012, Malev and Spanair are among the most significant. When Malev was declared insolvent in February of 2012, the impact was felt at the airline's base, Budapest, as passenger traffic declined 13% in February versus 2011. The collapse in January 2012 of Spanair, whose base was at Barcelona (BCN), would have impacted traffic levels more severely at that airport had other carriers not offset the decline by increasing capacity. Cimber Sterling and Wind Jet, the Danish and Italian carriers that also ceased operations in 2012, had similar impacts on passenger traffic levels at their base airports.

3.2 Airline Financial Performance

3.2.1 Traffic & Capacity

Passenger growth of 5.3% (measured in Revenue Passenger Kilometres) in 2012 was slightly down on the 5.9% growth witnessed in 2011. Air Freight markets declined further in 2012, with total Freight Tonne Kilometres 1.5% below the level of 2011.

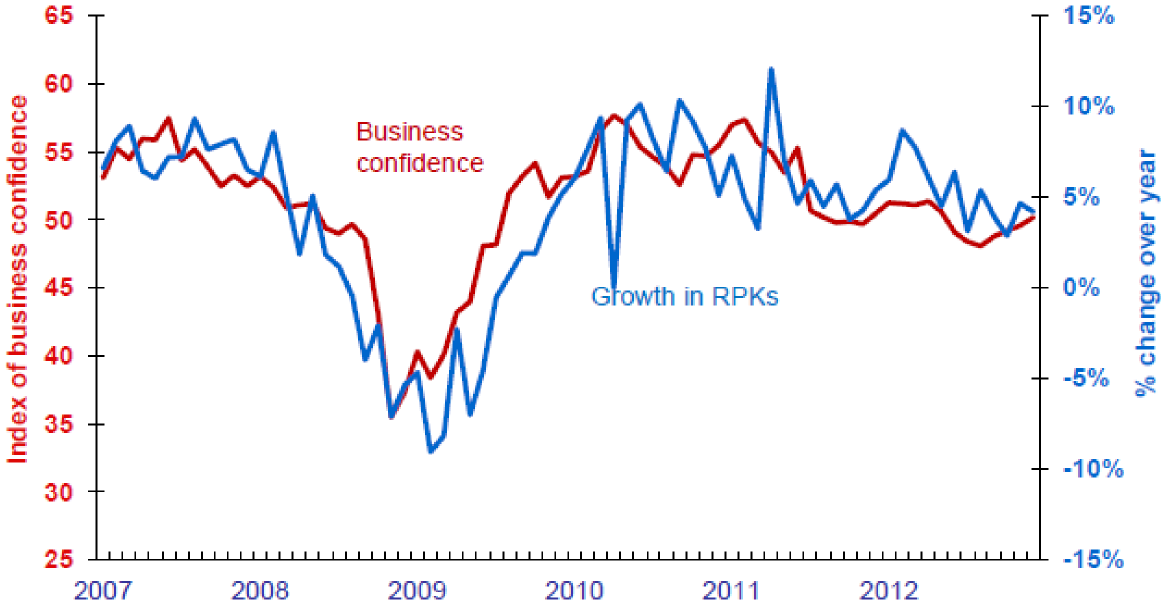
Figure 3.1: Total Air Freight & Passenger Volumes (Seasonally Adjusted)



Source: IATA

The continuation of the positive trend in passenger traffic growth was closely linked with steady global GDP growth during 2012 (albeit below 2011 levels), and its associated positive impact on business confidence. Also despite the Eurozone prices, many of Europe's key air markets continued to post overall growth.

Figure 3.2: Worldwide growth in air travel & Business Confidence

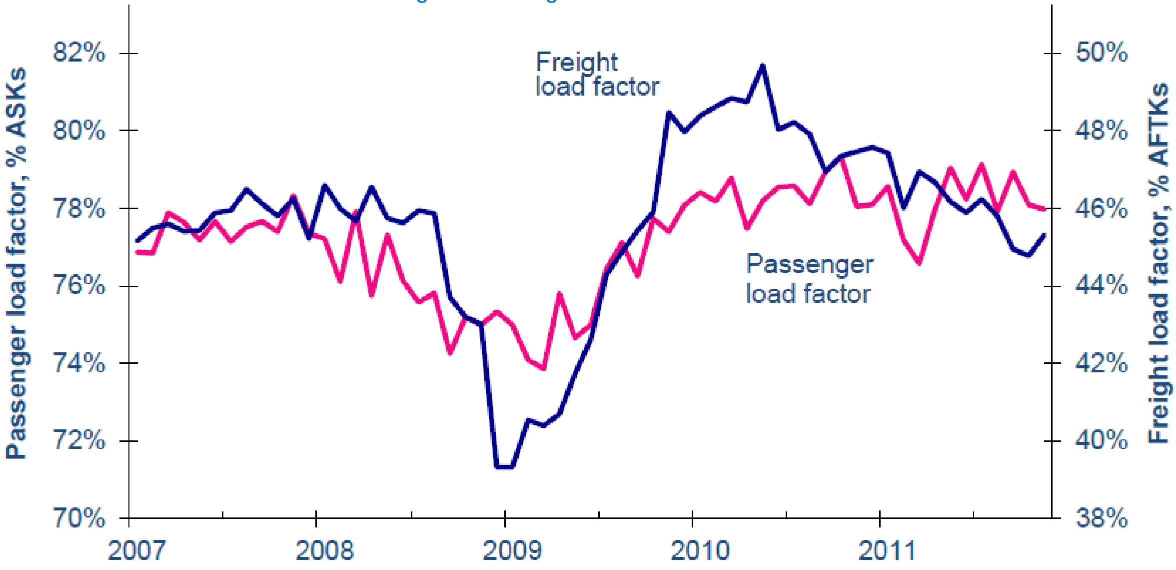


Source: IATA

Airlines were able to increase Passenger Load Factors during 2012 as the rate of growth in RPKs outpaced the rate of growth in ASKs. With an industry average of 79.1%, passenger load factors in 2012 were 1%

above the levels seen in 2011. 2011 was hit by the early year shock of the Tsunami in Japan which caused a significant decrease in traffic in the Pacific region.

Figure 3.3: Load Factors on Total Passenger and Freight Markets



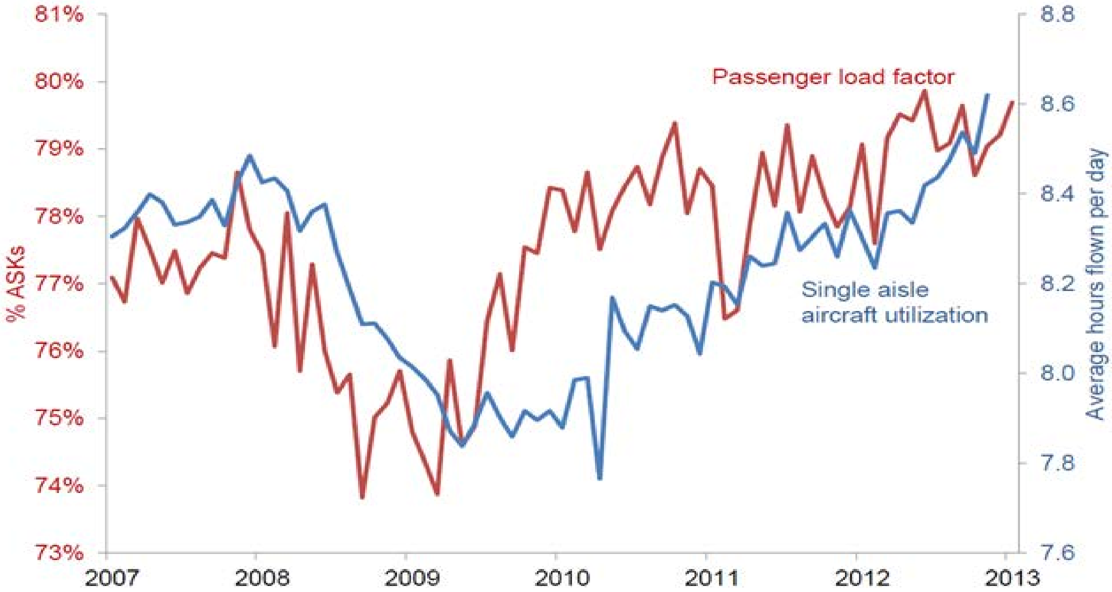
Source: IATA

For air freight, capacity increased by 0.2% in 2012 but load factors decreased by 0.7 percentage points to 45.2%, continuing the downward trend that started in the 2nd quarter of 2010, though there were signs of a slight upward trend towards the latter months of 2012.

Freight load factors are always significantly below the levels achieved by passenger load factors for the following main reasons; the seasonality of freight; directional imbalances by route; the provision of excess freight capacity on many routes caused by the need to provide sufficient seat capacity to meet passenger demand, irrespective of freight demand.

Globally, airlines were using their assets more during 2012, achieving higher aircraft utilisations than in 2011 (an increase from 8.2 average hours at the start of 2012 to above 8.6 by the end of the year – see Figure 3.4). This is to be expected as low cost carriers continue to grow and increase their market share of the passenger market. It is also likely that legacy carriers will seek to improve their aircraft utilisation in order to compete.

Figure 3.4: Aircraft Utilisation

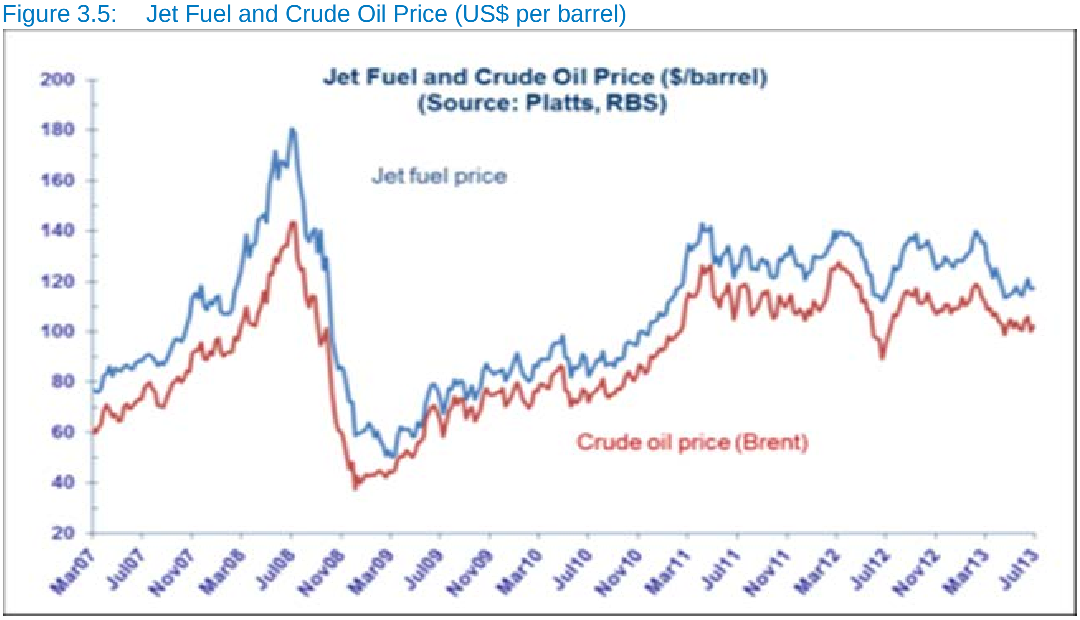


Source: IATA

3.2.2 Costs, Revenues & Profitability

As in most previous years, the cost of jet fuel remained a key concern for airlines in protecting profitability in 2012. Figure 3.5 below shows the volatility of jet fuel prices during the year with peaks and troughs, but prices remained relatively similar to the levels seen in 2011 with a pronounced drop seen between March and July 2012.

Figure 3.5: Jet Fuel and Crude Oil Price (US$ per barrel)



Source: IATA, Platts

The price of a barrel of jet kerosene (in US$) is shown for the period 2007 to 2012. There was a steady rise from March 2007 (at around $78 a barrel) to a peak of $180 by June 2008, then a substantial decline to around $52 by February 2009. This was preceded by an apparently inexorable increase once more to a peak of some $140 by April 2011, since when prices remained consistently around the $120-$130 mark. Prices throughout 2012 maintained a similar average figure to 2011 but with a noticeable trough between March and July as production outpaced actual demand for oil.

Despite fuel prices remaining at similar levels to those seen in 2011, average return fares were slightly lower in 2012 than the previous year. IATA reports that the strengthening US dollar has meant that yields have improved in terms of local currencies despite the falling dollar cost. Both yields and fares have been increasing since mid-2009.

Figure 3.6: Average International Return Air Fare and US Airline Yield

Source: IATA

Table 3-1 is IATA's summary of the recent history of global airline costs and revenues, based on actuals provided by ICAO.

Table 3-1: System-Wide Global Commercial Airlines Industry Statistics

	2006	2007	2008	2009	2010	2011	2012
REVENUES, US$ billion	**465**	**510**	**570**	**476**	**579**	**636**	**679**
% change	12.5	9.6	11.7	-16.5	21.8	9.7	6.9
Passenger	365	399	444	374	445	497	538
Cargo	53	59	63	48	66	67	62
Traffic Volumes							
Passenger growth, TKP, %	6.2	7.5	2.7	-2.4	8.8	6.2	5.3
Passenger numbers (million)	2,277	2,478	2,515	2,479	2,681	2,845	2,977
Cargo growth, TKP, %	6.3	4.7	-0.7	-8.8	19.4	-0.1	-1.1
Freight tonnes (million)	41.8	44.4	42.9	42.6	50.7	51.4	51.4
World economic growth, %	4.0	3.8	1.7	-2.3	4.0	2.6	2.2
Passenger yield, %	6.6	1.7	8.2	-13.7	9.6	5.0	2.9
Cargo yield, %	4.4	5.6	7.0	-15.2	14.4	1.3	-6.3
EXPENSES, US$ billion	**450**	**490**	**571**	**474**	**550**	**622**	**665**
% change	10.1	8.8	16.5	-16.9	16.1	12.9	7.0
Fuel	116	133	187	123	139	176	210
% of expenses	26	27	33	26	25	28	32
Crude oil price, USD/b	65.1	73.0	99.0	62.0	79.4	111.2	111.8
Non-Fuel	334	356	384	351	412	446	455
Cents per ATK (non-fuel unit cost)	39.0	39.0	40.9	39.0	43.3	44.6	44.3
% change	0.2	0.1	4.9	-4.7	11.2	2.8	-0.5
Break-even load factor, %	60.3	59.9	61.8	61.4	62.0	63.2	63.8
Weight load factor achieved, %	62.3	62.4	61.7	61.6	65.3	64.7	65.2
Passenger load factor achieved, %	76.0	77.0	75.9	76.0	78.5	78.3	79.2
OPERATING PROFIT, US$ billion	**15.0**	**19.9**	**-1.1**	**1.9**	**28.9**	**14.1**	**14.8**
% margin	3.2	3.9	-0.2	0.4	5.0	2.2	2.2
NET PROFIT, US$ billion	**5.0**	**14.7**	**-26.1**	**-4.6**	**19.2**	**8.4**	**7.4**
% margin	1.1	2.9	-4.6	-1.0	3.3	1.3	1.1

Source: IATA Fact Sheet September 2013;

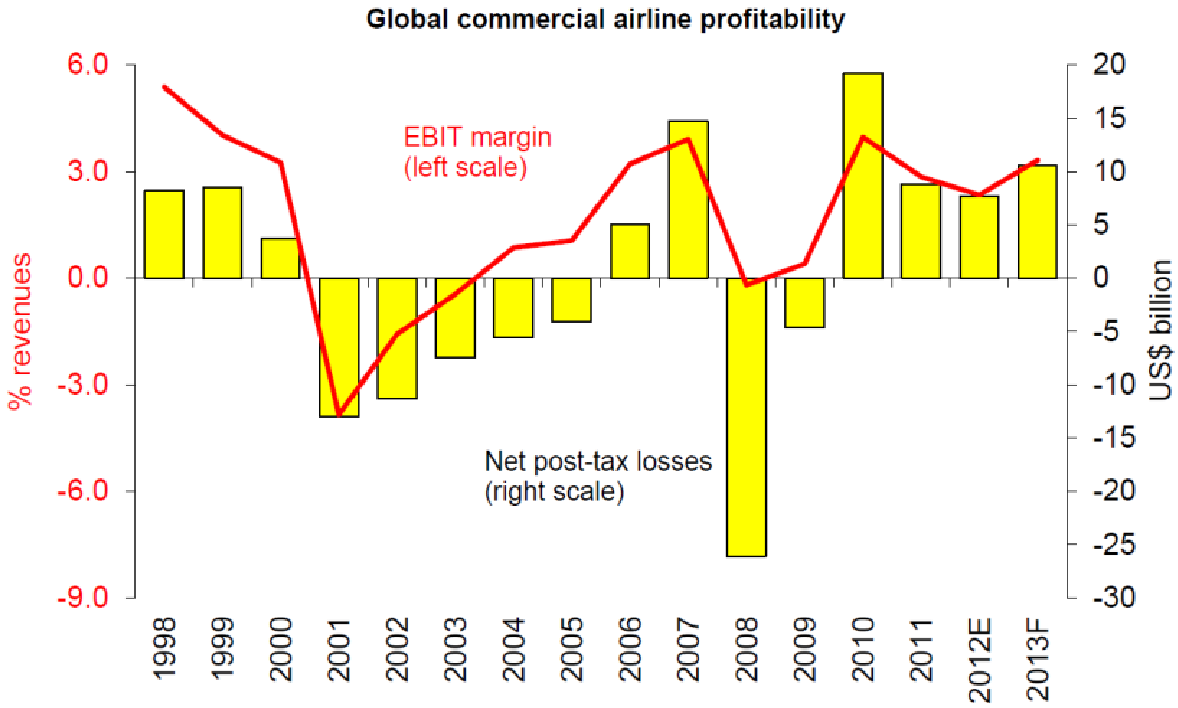
Costs and revenues shown in Table 3-1 are in current USD and include the impacts of inflation.

Industry wide net profits of $7.4 billion are lower than 2011, despite an increase in operating profit. A 7.0% increase in total expenses is one reason for the decrease in profitability. The main contributory factor is once again jet fuel price. Fuel, in 2012, accounted for 32% of total expenses and the industry fuel bill was 19% higher than it was in 2011. Other non-fuel expenses actually declined by 0.5% compared with 2011. A reduction of 6.3% in cargo yields will also have impacted the financial performance of many major airlines.

There was a regional disparity within the overall level of profitability. Asia Pacific airlines commanded the greatest share of profits, contributing $4.0 billion (or 54% of the total) to the industry coffers. North American airlines were next, accounting for $2.3 billion (31%), followed by Middle Eastern airlines with $1.0 billion (14%). European airlines provided 5% of total industry profits, at $0.4 billion.

Figure 3.7 shows the same profits and losses in terms of net result as a percentage of revenue and covering the longer period from 1998, including the related EBIT result. The impacts of ‘shock events’ on air travel demand, such as the 2001 terrorist attacks in the U.S, and the global economic downturn starting in 2008, are clearly shown.

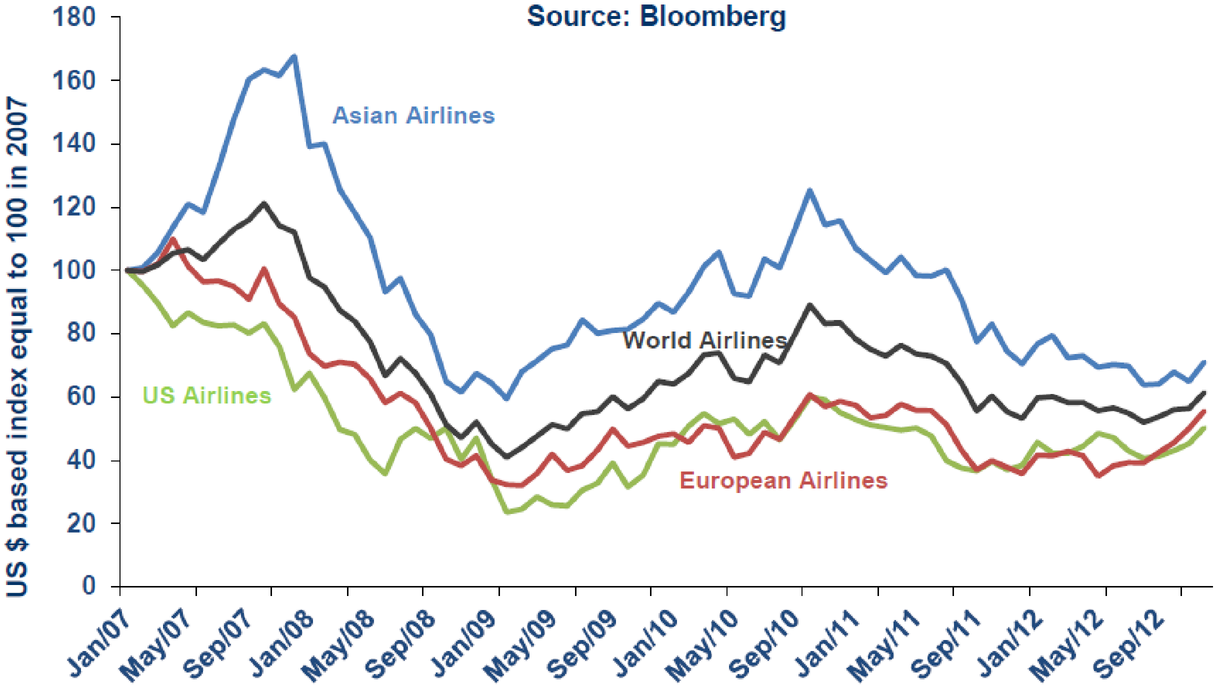
Figure 3.7: Global Commercial Airline Profitability



Source: IATA, ICAO June 2013

The share values of the world’s major airlines remained subdued throughout much of 2012 but showed a marked improvement towards the end of the year as many European airlines posted encouraging Q3 results. IATA attributed the subdued performance in share prices throughout the early part of 2012 to the reduced air cargo demand experienced throughout the market.

Figure 3.8: Bloomberg Airlines Index



Source: IATA; Bloomberg

In common with 2011, 2012 produced a mixed picture of airline financial results (Table 3-2). Of the top 5 airlines, Lufthansa, Delta and Fedex posted substantial profits, while the Air France KLM group and United-Continental Holdings recorded losses. American Airlines parent company AMR recorded a second successive year of losses as it continues to restructure under Chapter 11 bankruptcy protection. International Airlines Group, the parent company of British Airways and Iberia recorded full year losses for 2012 after profits in 2011 largely as a result of industrial action and substantial restructuring at Iberia.

Three of the top ten airline groups ranked by revenue are European, with Lufthansa Group marginally topping the rankings ahead of the US majors United-Continental and Delta. The three European giants of Lufthansa, Air France-KLM and IAG all underwent business restructuring in 2012 – mostly in shorthaul operations – and their financial results were compounded by underperformance in key areas, in addition to coping with higher fuel costs and a generally weak economic climate. Further drilling down into these group results show that British Airways posted an annual profit in 2012, with Iberia posting losses.

Table 3-2: 2012 Top 25 Airline Groups by Revenue

Ranking in 2012	Group/Airline	Country	Region	Revenues (US$ m)	Net Profit ($m) 2012	2011
1	Lufthansa Group	Germany	EU	38,877	1,277	-18
2	United-Continental Holdings	USA	North America	37,152	-723	840
3	Delta	USA	North America	36,670	1,009	854
4	Air France KLM Group	France	EU	33,090	-1,538	-1,131
5	Fedex Express	USA	North America	27,171		
6	AMR	USA	North America	24,855	-1,876	-1979
7	International Airlines Group (IAG)	UK/Spain	EU	23,373	-1,191	776
8	Emirates	UAE	Middle East	21,110	845	629
9	Southwest Airlines	USA	North America	17,088	421	178
10	Qantas	Australia	Asia Pacific	16,316	-253	248
11	Air China	China	Asia Pacific	16,005	782	1095
12	ANA Group	Japan	Asia Pacific	15,895	440	347
13	China Southern Airlines	China	Asia Pacific	15,795	601	944
14	Japan Airlines Corporation	Japan	Asia Pacific	14,878	2,061	2366
15	US Airways	USA	North America	13,831	637	71
16	China Eastern Airlines	China	Asia Pacific	13,804	446	710
17	Cathay Pacific	Hong Kong	Asia Pacific	12,813	118	707
18	Singapore Airlines Group	Singapore	Asia Pacific	12,169	305	269
19	Air Canada	Canada	North America	12,131	131	-253
20	Korean Air	Republic of Korea	Asia Pacific	10,950	244	-272
21	Turkish Airlines	Turkey	Europe (Non EU)	8,318	632	11
22	TAM	Brazil	Latin America	6,990	-604	-157
23	Thai Airways International	Thailand	Asia Pacific	6,747	210	-199
24	Ryanair	Ireland	EU	6,290	733	774
25	easyJet	UK	EU	6,102	404	362

Source: Flight Global Pro

Ten of the top 25 in the list are Asia Pacific airline groups, but with only Qantas featuring in the top 10 and both posting a net loss in 2012 of US$253. All of the other nine airlines in the Asia Pacific region recorded net profits in 2012 underlining the health of the market in the region. Growing economies and comparatively low staff costs as well as an environment that accommodates expansion in the aviation industry all assist in ensuring airline profitability.

2012 saw UK based low cost carrier easyJet enter the top 25 airline group for the first time, replacing the Scandinavian conglomerate SAS, the third Low Cost Carrier in the top 25 group behind Southwest and Ryanair.

3.3 Major Market Entries and Exits in Europe

In 2012, several airlines of significance entered the European market, recorded in Table 3-3.

Table 3-3 European Airline New Entrants in 2012

Airline	Country	Remarks
Aerospace One	Greece	Air cargo charter operator, initially connecting Asia with Latin America via Europe. Based at Chateauroux.
Alpha Express Airlines	Latvia	Operates cargo charter services from its Riga base.
Brighton City Airways	United Kingdom	Commenced services between Shoreham, near Brighton, UK and Pontoise, near Paris, France.
British Airways Limited	United Kingdom	Subsidiary of British Airways, operating the carrier's premium transatlantic services from London City (LCY) to New York (JFK).
Excellent Air	Malta	Operates charter and ACMI services from Malta
Jetxtra	United Kingdom	Operates seasonal weekly international scheduled / charter passenger services from Humberside to Alicante and Palma de Mallorca.
Lubeck Airways	Germany	Domestic regional services between Lubeck and Dusseldorf
Melilla Airlines	Spain	Operates scheduled passenger services between Malaga and Melilla
SkyGreece Airlines	Greece	Founded in September 2012, planning to launch long-haul scheduled services from Athens.
Vizion Air	Belgium	Operates ad hoc charter services from Antwerp using a wet-leased Fokker 50 aircraft

Source: Ascend

A number of airlines operating in Europe ceased operations and entered insolvency in 2012. Table 3-4 lists the most significant of these.

Table 3-4 European Airlines Ceasing Operations in 2012

Airline	Country	Remarks
Air Finland	Finland	The airline filed for bankruptcy in June 2012.
Bmi – British Midland International	United Kingdom	Subject of a takeover by International Airlines Group (IAG).
Bmibaby	United Kingdom	Ceased operations after purchase of bmi by International Airlines Group.
Cimber Sterling	Denmark	The airline filed for bankruptcy in May 2012.
Cirrus Airlines	Germany	The airline filed for bankruptcy in January 2012.
City Airline	Sweden	Acquired by Skyways Airlines Sweden.
Czech Connect Airlines	Czech Republic	The airline filed for bankruptcy in January 2012.
Direct Aero Services	Romania	The airline suspended operations and had its operating certificate revoked in March 2012.
Islas Airways	Spain	The airline ceased operations in October 2012.
Malev	Hungary	The airline was declared insolvent and ordered to liquidate by the Metropolitan Court of Budapest in February 2012.
Mint Airways	Spain	The airline declared voluntary insolvency in May 2012.
OLT Express Poland	Poland	The airline filed for bankruptcy in July 2012.
OLT Regional Express	Poland	The airline filed for bankruptcy in July 2012.
Spanair	Spain	The airline ceased operations after financial problems in January 2012.
Wind Jet	Italy	The airline suspended all flight due to financial problems in August 2012.

Source: Ascend

3.4 Legacy Carriers

Legacy carriers are full-service airlines operating domestic, regional and intercontinental passenger services, often from one hub in their home territory and providing between them a network of air services across the globe.

3.4.1 Top 25 Carriers

Capacity growth for the top 25 legacy carriers measured in ASKs grew by 6.2% in 2012 (Table 3-5). Despite a reduction in capacity of 3.3% Delta remained at the top of the capacity rankings for 2012, although the merger between United and Continental means that the combined entity creates a close second. In common with 2011, US major carriers dominate the top three places with United and American in second and third respectively, American recording a reduction in capacity as it remains in bankruptcy protection.

The Middle Eastern Airlines of Emirates and Qatar Airways again posted double digit increases in available capacity, while Turkish Airlines posted substantial growth of 20.3%. Many legacy airlines in the Asia Pacific region reduced capacity during 2012. A possible reason for this is the continued expansion of Low Cost Carriers in the region at the expense of the legacy airlines.

Table 3-5: Top 25 Legacy Carriers

Rank	Airline	Region	2012 ASKs (millions)	vs. 2011	ASK YoY growth (millions)
1	Delta Air Lines	North America	369,905	-3.3%	-12,652
2	United Airlines	North America	358,929	51.2%*	121,473
3	American Airlines	North America	274,862	-2.0%	-5,385
4	Emirates Airlines	Middle East	221,170	16.8%	31,793
5	Lufthansa German Airlines	EU	185,278	-1.2%	-2,255
6	British Airways	EU	165,381	3.1%	5,077
7	Air France	EU	156,951	-0.6%	-872
8	US Airways	North America	144,993	2.1%	2,996
9	China Southern Airlines	Asia Pacific	129,246	9.1%	10,781
10	Cathay Pacific Airways	Asia Pacific	120,018	-4.5%	5,598
11	Singapore Airlines	Asia Pacific	118,971	2.6%	3,044
12	Air China	Asia Pacific	114,008	4.7%	5,089
13	Air Canada	North America	108,550	0.7%	790
14	China Eastern	Asia Pacific	104,443	10.1%	9,593
15	KLM	EU	99,881	4.1%	3,914
16	Turkish Airlines	Europe (Non-EU)	97,602	20.3%	16,492
17	Qantas Airways	Asia Pacific	97,545	-3.5%	-3,558
18	Korean Air	Asia Pacific	95,434	3.3%	3,084
19	Qatar Airways	Middle East	91,475	13.1%	10,602

Rank	Airline	Region	2012 ASKs (millions)	vs. 2011	ASK YoY growth (millions)
20	Japan Airlines	Asia Pacific	86,836	13.1%	10,033
21	All Nippon Airways	Asia Pacific	79,695	-4.7%	-3,972
22	Thai Airways	Asia Pacific	79,573	-3.6%	-2,967
23	TAM	Latin America	77,807	1.9%	1,436
24	Iberia	EU	65,443	-4.7%	-3,262
25	Aeroflot	Europe (Non-EU)	60,968	18.8%	9,656
	Top 25 Total		3,504,964	6.2%	216,518

Source: OAG

3.4.2 Europe

IATA reported that its European airlines achieved year-on-year passenger traffic increases of 5.1%, narrowly trailing the collective RPK figure of 5.1% in 2012. Average load factors increased to 79.6% from 78.9% in 2011. These increases have been recorded despite the ongoing Eurozone financial/debt crisis throughout 2012.

The Association of European Airlines (AEA) recorded an annual RPK growth for its member airlines of 3.6%, lower than the 5.1% reported by IATA (Table 3-6). This might be explained by the fact that AEA membership is primarily legacy European carriers and the lower growth recorded reflects that a significant portion of the additional capacity and passenger growth on European routes came from low cost carriers (LCCs) and those based outside the European Union.

The general picture that emerges is one of reduced capacity but an increase in revenue passenger kilometres and overall passenger numbers. This reflects the trend that airlines are maintaining a tight grip on capacity and are concentrating on increasing load factors and making the best use of their aircraft and slots at many constrained airports.

All Intra-European services experienced reduced capacity in 2012 but both RPKs and total passenger numbers increased. All long haul services saw growth in ASKs, RPKs and capacity. The main reason for this is that long haul services tend to be more profitable for the legacy carriers that comprise the main element of AEAs membership, and as such airlines will usually prioritise long haul services over short haul services when deciding on the use of a new slot.

Domestic markets witnessed dampened demand, with a decline in traffic growth of 1.6% and declines in both capacity (-1.8%) and Revenue Passenger Kilometres (-0.9%). Cross border traffic in Europe increased by 1.2%, a sign that despite the continuing Eurozone issues, the market remained relatively resilient. After the turmoil experienced in North Africa during 2011, traffic returned to the region with 19.7% growth in terms of passengers and 14.8% in terms of Revenue Passenger Kilometres.

Table 3-6: Scheduled Services of AEA Member Airlines in 2012

Region	Passenger Data (2012)				Change vs. previous year			
	Passengers Boarded (000)	Traffic RPK (million)	Capacity ASK (million)	Load Factor %	Pax %	Traffic %	Capacity %	PLF Pts
Domestic (1)	90,949	49,402	71,069	69.4	-1.6%	-0.9%	-1.8%	0.6
Cross-border Europe (2)	183,361	205,031	277,706	73.3	1.2%	2.4%	-0.5%	2.1
Total Europe (1+2)	277,310	254,433	348,773	72.5	0.2%	1.7%	-0.7%	1.8
Europe - North Africa (3)	4,755	9,170	12,816	71.3	19.7%	14.8%	-8.1%	4.1
Europe - Middle East (4)	10,826	33,516	46,649	71.7	3.0%	3.0%	-2.1%	2.0
Intl Short/Medium Haul (2+3+4)	201,942	247,717	337,172	73.0	1.6%	2.6%	-0.4%	2.1
North Atlantic (5)	30,296	211,084	248,793	84.2	3.0%	3.3%	0.6%	2.2
Mid Atlantic (6)	7,506	59,459	70,925	83.8	2.7%	3.6%	1.7%	1.6
South Atlantic (7)	6,847	62,659	73,948	84.7	5.8%	7.3%	7.4%	-0.1
Europe - Sub Saharan Africa (8)	9,846	63,330	80,516	77.5	6.4%	6.0%	5.8%	0.2
Europe - Far East/Australasia (9)	21,523	172,285	211,864	81.2	5.5%	3.4%	5.6%	-3.7
Total Long Haul (5 to 9*)	76,249	569,116	686,514	82.7	4.1%	4.5%	2.5%	1.6
Total Intl (2 to 9*)	278,181	816,833	1,023,686	79.6	2.3%	3.9%	1.5%	1.9
Total Scheduled (1 to 9*)	369,140	866,235	1,094,755	78.9	1.3%	3.6%	1.3%	1.8

Source: AEA (passenger traffic is measured in passengers boarded (Pax), RPK (Revenue Passenger-Km) and capacity in ASK (Available Seat-Km). *Long haul region 'Other' is not shown above, but is included in the total.

For AEA carriers in 2012, strong passenger growth was achieved on routes to the South Atlantic (+5.8%), the Far East/Australasia (+5.5%) and Europe – Sub Saharan Africa (+6.4%).

Continuing the theme established in 2011, 2012 saw the major European Airlines increase the total number of passengers carried and increase load factors from an average of 80% to 81.3%. Low Cost Carriers Vueling, Wizz Air and Norwegian saw the strongest growth with 20.1%, 11.7% and 12.7% respectively.

The three largest European legacy carriers all experienced growth in terms of passenger numbers, RPKs and ASKs. British Airways saw a 9.7% increase in the number of passengers carried, largely as a result of the takeover of British Midland in April. This was a contrast to its sister company Iberia, which saw a decrease of 14.7% in terms of passengers carried. Iberia continues to suffer from strikes and a difficult financial position which continues to impact on passenger traffic.

Table 3-7: Top 25 European Airlines ranked by RPKs in 2012

Airline	Passenger Data				% change vs. previous year			
	Passengers Boarded (million)	Traffic RPK (million)	Capacity ASK (million)	Load Factor %	Pax	Traffic	Capacity	PLF Pts
Lufthansa	74.7	149,780	191,735	78.1	2.4	1.3	0.2	0.8
Air France	50.6	135,824	166,657	81.5	1.2	2.1	0.7	1.1
British Airways	37.6	126,436	158,247	79.9	9.7	7.7	5.4	1.7
Ryanair	79.3	100,000	120,000	82.0	4.6	6.1	4.8	-0.1
KLM	25.1	86,281	100,727	85.7	1.7	2.5	0.8	1.4
Turkish Airlines	26.6	74,638	96,066	77.7	5.1	26.6	18.4	5.1

Airline	Passenger Data				% change vs. previous year			
easyJet	58.4	65,227	72,182	90.4	7.2	6.3	4.1	1.9
Iberia	14.8	49,663	60,932	81.5	-14.7	-3.1	-3.3	0.2
Air Berlin	33.3	48,720	60,400	80.7	-5.5	-6.6	-2.8	-3.2
Virgin Atlantic Airways	5.4	39,406	50,491	78.0	3.2	3.7	3.0	0.5
Alitalia	24.3	36,192	48,515	74.6	-4.0	1.4	-1.0	1.8
Swiss International Airlines	15.8	33,527	40,429	82.9	3.3	6.1	4.7	1.1
Thomson Airways	10.7	32,073	34,852	92.0	-3.1	-2.7	-5.6	2.7
Scandinavian Airlines	25.5	27,798	37,146	75.1	3.7	5.4	4.2	0.9
TAP Portugal	10.2	27,216	35,437	76.8	4.4	4.9	4.1	0.5
Condor	6.6	23,779	26,991	88.1	7.0	0.9	2.6	-1.5
Finnair	9.6	23,563	30,365	77.6	9.5	9.6	3.5	4.3
Thomas Cook Airlines	6.8	22,541	23,954	94.1	-14.9	-17.8	-18.4	0.7
Norwegian	17.7	20,353	25,927	78.5	12.7	16.8	18.0	-0.8
Austrian	11.3	17,952	23,163	77.5	1.8	0.9	-4.0	3.8
Air Europa	8.1	17,429	21,152	82.4	-6.8	-1.6	-5.1	2.9
Wizz Air	12.4	16,000	18,669	85.7	11.7	12.3	9.1	1.7
Monarch Airlines	6.3	14,854	17,352	85.6	6.2	4.0	2.2	1.5
Aer Lingus	9.7	14,523	18,691	77.7	1.5	3.4	0.5	2.1
Vueling Airlines	14.8	13,693	17,622	77.7	20.1	26.6	23.1	2.1
Total Top 25	**595.6**	**1,217,468**	**1,497,702**	**81.3**				

Source: Airline Business (August 2013 edition)

Of the European airline failures in 2012, Malev and Spanair are among the most significant. When Malev was declared insolvent in February of 2012, the impact was felt at the airline's base, Budapest, as passenger traffic declined 13% in February versus 2011, with a further reduction of 9% in March.

The collapse in January 2012 of Spanair, whose base was at Barcelona (BCN), would have impacted traffic levels more severely at that airport had other carriers not offset the decline by increasing capacity. According to OAG, Spanair's seat capacity at Barcelona reduced by 2.5m in the calendar year 2012, but the leading two airlines at the airport, Vueling and Ryanair, added a combined 3.0m extra seats compared to 2011.

Cimber Sterling is another European airline that went insolvent in 2012. The Danish carrier declared bankruptcy in May of that year, contributing to an almost 20% annual decline in domestic passenger traffic at its Copenhagen base, due to its extensive domestic network of services in Denmark.

Similarly, when Wind Jet, the Italian carrier, ceased operations in August 2012, the withdrawal of seat capacity across its network impacted traffic levels at its Italian airports. For instance, passenger throughput at Catania Airport declined by 9% in August and 8% in September, compared to the previous year. At Palermo Airport, a 7% decline in August followed by -11% in September was reported.

3.4.3 North America

IATA reported that its North American-based airlines achieved a collective year-on-year RPK increase of 1.1% in 2012 over 2011, ahead of a seat capacity increase of 0.1%. Average load factors increased to 82.9% from 80.7% in 2011 as IATA recorded a strong trend towards capacity control in the major US airlines throughout the year. This was partly as a result of the Continental/United merger, which removed duplication of capacity on certain routes.

As a rule Load Factors increased across the U.S. carriers in 2012 as the effect of mergers filtered through the system and airlines continued to keep capacity tight with the aim of increasing yield. Only Southwest/Air Tran recorded a decline in average load factors.

Table 3-8: 2012 Summary Data for U.S Major Airlines

	Operating aircraft	Passengers (millions)	Passengers YoY (%)	Load factor (%)	Load factor YoY (% points)
United / Continental	699	93.6	-2.9	82.9	0.1
Delta Air Lines	723	164.6	0.4	83.7	0.4
American Airlines	616	86.3	0.3	82.8	0.9
US Airways	342	54.3	2.5	84.1	0.4
Southwest/AirTran	697	134.1	-0.9	80.3	-0.6
jetBlue Airways	186	29.0	9.8	83.8	1.3
Alaska Airlines	128	18.5	4.0	86.6	1.5

Source: Airline Business August 2012

3.4.4 Asia Pacific

Growth continued in the Asia Pacific region with a 6.0% increase in Revenue Passenger Kilometres and a 3.0% increase in Available Seat Kilometres. Load Factor in the region increased from 75.9% to 77.5%, following a trend across the global market with a focus on increased load factors over additional capacity. Growth in the Chinese domestic market remained strong with a 9.5% growth in RPKs compared to 2011, while growth in Japan was only 3.6% as a result of continued economic uncertainty, despite the associated year on year recovery from the tsunami.

According to industry sources[13] the top Chinese carriers, and the Chinese airline sector in general, have continued to contribute to the regions dynamic growth. In terms of revenues, the three major Chinese legacy carriers of Air China, China Southern and China Eastern are comfortably established within the top 20 in the world. China Southern took delivery of Airbus A380 aircraft and has ambitions to be a major player in the Europe – Australasia route.

The Japanese domestic market saw growth in 2012 but IATA notes that traffic has not recovered yet to pre tsunami levels. High speed rail continues to provide strong competition but the Japanese economy was also impacted by reduced exports arising from the continued Eurozone weakness.

[13] Airline Business, August 2012, p38-39

The Asia Pacific region has traditionally been the most profitable region in the airline industry and 2012 saw an improvement in both operating and net profits. Japan Airlines posted profits in excess of $2bn for example. Despite the underlying trend of profitability, the airlines in the region have had to adapt to market conditions, as low cost carriers provide further competition on previously high yield, short haul routes[14]. Garuda, Singapore Airlines and Thai are 3 airlines that have created a low cost subsidiary in recent years.

Traffic-wise, there was solid growth across the region as a whole in 2012. Strong growth was in evidence in the Chinese market with China Eastern and China Southern becoming the 9th and 10th largest airlines in the world measured in terms of Revenue Passenger Kilometres (RPKs). Top-tier legacy airlines such as Singapore Airlines, Qantas Airways, Cathay Pacific and All Nippon also remain in the top 25.

Similarly to 2011, a significant part of the growth in this region in 2012 came from growth in the Chinese domestic market. For example, passenger traffic in the domestic Chinese markets grew by 9.5%. There was however a contraction in the Indian market of 2.1% as Kingfisher's withdrawal from the market took effect. In common with previous years, some Indian carriers continued to post poor financial results with Air India posting a loss of US$954m and Jet Airways a loss of US$74m. The Chinese market did however see an improvement in profitability with China Eastern posting profits of US$671m and China Southern a profit of US$809m.

3.4.5 Middle East

According to IATA figures, Middle Eastern carriers recorded strong passenger traffic growth in 2012. RPK demand increased by 15.2% over 2011 figures, compared to a capacity growth (ASK) of 12.4%, with a corresponding increase of 2 percentage points in passenger load factor to 77.5% for the year.

In financial terms, a strong rise in revenues for Middle East carriers did not hamper the profitability of the regions' largest carrier, Emirates. Profit at Emirates increased from US$629m to US$845m for 2012.

The three Middle East network carriers – Emirates, Etihad Airways and Qatar Airways – have to date remained unaligned to any global airline alliance, but in 2012 Qatar Airways announced its intention to join the oneworld alliance during late 2013. However, Qatar Airways also divested its 35% stake in European Cargo airline, Cargolux after only one year of ownership.

Etihad Airways continued to make further airline investments during 2012. After purchasing a 29% stake in Air Berlin, Etihad followed this up with the purchase of a 40% stake in Air Seychelles, a 3% stake in Aer Lingus and a 10% stake in Virgin Australia.

3.4.6 Latin America

IATA reports Latin America witnessed strong passenger growth in 2012.

Carriers in this region experienced passenger traffic (RPK) growth of 8.4% in the year on a capacity (ASK) growth of 7.5%. The load factor for the region increased from 74.6% in 2011 to 77.4% for 2012.

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[14] Airline Business, August 2012, p32.

The Brazilian domestic market, which remains a key part of the Latin American landscape, grew by 8.6% in 2012, slightly below the 13.7% seen in 2011 but strong growth nonetheless.

The Latin American market also saw continued consolidation in the market during 2012. Details of the LAN/TAM merger were finalised with the merged entity joining the oneworld alliance, as well as the completion of the Avianca TACA merger with the merged entity joining Star Alliance.

The major airlines in the region all continued to contribute to the strong growth in the market, with LAN Airlines (15.1%), TAM (2.1%), Avianca (12.9%), Aeromexico (3.3%) Copa Airlines (17.1%) and Aerolineas Argentinas (9.5%) all reporting increased passenger numbers in 2012.

3.4.7 Africa

Overall, African carriers reported a significant growth in passenger traffic (RPKs) of 7.2% in 2012, following a slightly more subdued performance in 2011. Capacity increased by 7.1% year-on-year, while load factors fell to an average of 67.1% from 67.5% a year earlier.

The major legacy airlines in Africa reported a mixed bag of passenger growth results in 2012. South African Airways, the largest African carrier, posted an increase in RPKs of 6.5%. Egyptair recovered strongly from the political turmoil experienced in 2011 posting RPK growth of 16%. Ethiopian Airlines continues its impressive growth trajectory, increasing RPKs by 24.4%. Kenya Airways however posted a marginal decline of 3.7% versus 2011.

The weakness of some of Africa's national carriers has meant that airlines from outside Africa have continued to expand significantly on the continent. Turkish Airlines continued to expand into the African continent by increasing the number of destinations served to 33 by the end of 2012, the largest African network by a non-African carrier. Its hub location at Istanbul allows it to serve a large amount of the African continent with narrow-body aircraft, which are better suited for many of the routes served. Many routes to African destinations do not have sufficient demand to fill a wide body aircraft and as such, Turkish Airlines hub location allows it a competitive advantage over its European competitors.

According to IATA, the markets achieving strongest growth in premium passenger traffic are Africa- Middle East (15.7%) and Africa – Far East (10.5%). IATA attributes growth of the former largely to greater trade relations between the two regions. Travel within Africa has proved resilient in 2012 due to strong economic growth rates in some of the continent's major economies.

Key issues impacting on air travel demand in Africa in 2012 continued to include slow progress on liberalising African skies with restrictive bilaterals still in force on many major markets and increased competition from overseas airlines such as Turkish Airlines and Emirates. South African Airways for example posted an operating loss of over US$100m in 2012 and is currently implementing its ninth turnaround plan as it seeks to return to profitability.

3.4.8 Global Airline Alliance Developments

2012 saw the continuation of the three main airline Alliances – Star Alliance™, SkyTeam® and oneworld® - although many world airlines continue to be unaligned.

Table 3-9: Global Alliances Summary (as July 2013)

Global Alliances	Star Alliance	oneworld	SkyTeam	Total
Member Airlines	28	12	19	59
Pending new members	0	5	1	6
Number of aircraft	4,701	3,343	2,853	10,897
Number of employees	452,590	277,500	414,686	1,144,776
Passengers per year (million)	772.4	341.5	569	1,628.9
Sales Revenue (in USD billion)	198.8	114.5	142.1	455.4
Daily departures	21,900	8,837	15,189	45,926
Revenue per passenger (USD)	273.3	335.2	249.7	
Departures per aircraft per day	4.7	3.6	5.3	
Passengers per departure	99.1	105.9	102.6	
Employees per aircraft	97.9	83	145.4	
Passengers per employee	1,580	1,230	1,372	
Revenue per departure (USD 000s)	24.9	35.5	25.6	

Source: Latest alliance websites/fact sheets, SkyTeam revenues estimated from individual airline revenues.

All three global alliances increased their membership and network coverage in 2012.

Star Alliance remained the largest alliance in terms of aircraft, passengers and revenues. In 2012 and to-date, several airlines have joined Star, notably newly formed Avianca-Taca, Copa Airlines and Ethiopian Airlines. Taiwan based EVA Air also joined the alliance in June 2013.

Air India was originally scheduled to join in 2009 but its membership has been delayed indefinitely as the invitation to join has been suspended.

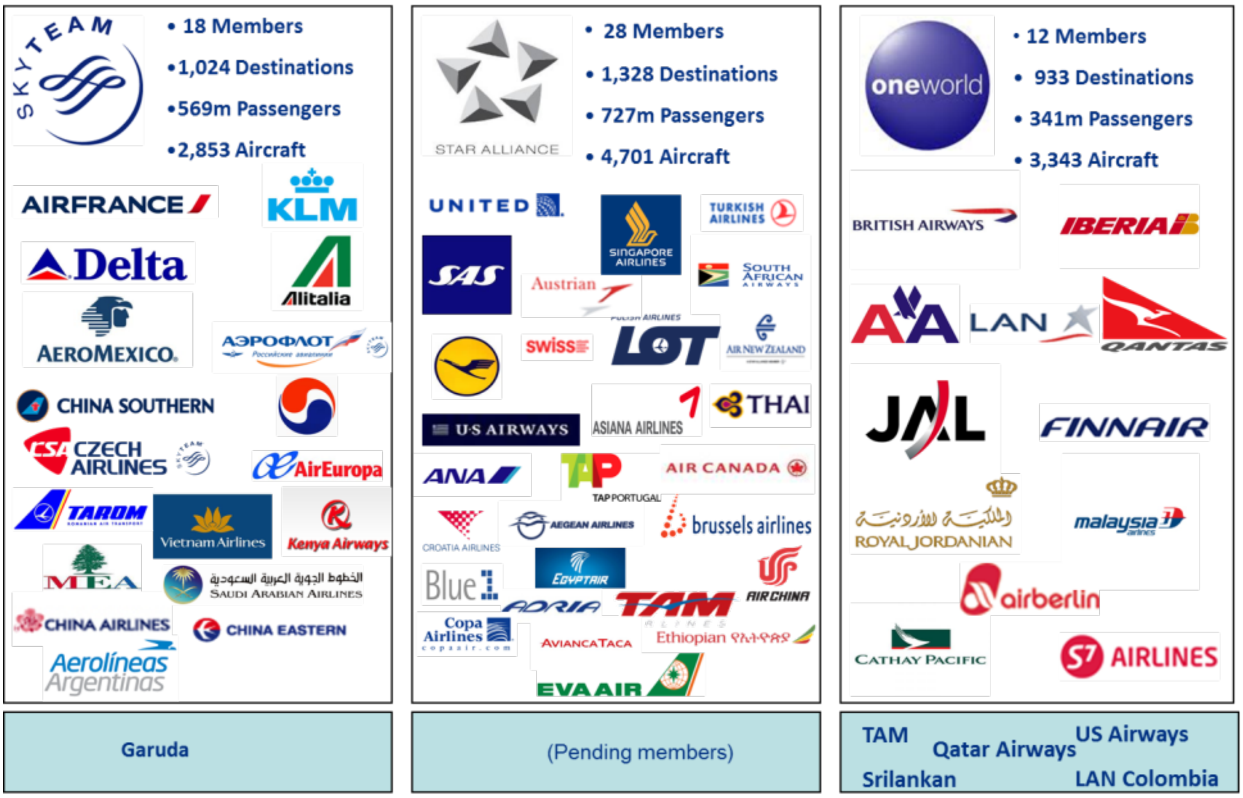
Aerolineas Argentinas and Xiamen Airlines joined the Sky Team alliance in 2012 while Garuda Indonesia remains pending with an expected joining date of March 2014.

The oneworld alliance membership gained Air Berlin in 2012, but lost Malev due to the airline ceasing operations. Malaysia Airlines joined the alliance in March 2013. It was announced in 2012 that Srilankan Airlines and Qatar Airways had also been invited to join the oneworld alliance. Qatar Airways would be the first of the ‘Middle Eastern 3’ carriers to join a global alliance. Qatar Airways is expected to join in late 2013, with Srilankan following in early 2014.

The oneworld alliance is also to gain additional members as a result of the LAN/TAM merger and the proposed merger of American Airlines and US Airways. In both cases the merged entities will be part of the oneworld alliance, resulting in the loss from Star Alliance of two airlines.

The latest airline alliance member lists are detailed in Figure 3.9 below with pending members indicated in the blue shaded areas.

Figure 3.9: Global Alliance Membership (as of July 2013)



Source: Mott MacDonald, Star Alliance, SkyTeam, oneworld

In terms of size and key indicators, an analysis of the latest traffic and financial data available is shown in Table 3-9 above. As was the case in 2011, oneworld alliance members achieved the combined highest revenue per aircraft departure and per passenger carried.

Alliances between legacy carriers continue to be the method by which most major airlines seek to reduce costs and increase their reach and market share. This is expected to remain the chosen route for such airlines until a situation is reached whereby nations no longer retain an interest in who owns the world's airlines. When that happens, there is likely to be a rapid contraction in the number of major airlines so that it would resemble the automobile industry or many other industries (including international shipping) where the result would be a handful of truly large multinational airlines, often based in low taxation territories with as much of their labour costs as possible contracted out to low-wage economies.

3.5 Regional Airlines

Regional airlines tend to operate, on average, small, sub-100 seat regional jet/turboprop aircraft. Many of these airlines operate feeder services to hub airports from regional points and operate thinner domestic and intra-continental routes. However, some regional airlines adopt a full-service 'legacy' approach to operations and marketing (particularly those feeding the hubs of their commercial partners), whilst others take on aspects of the low-cost model such as a 'no-frills' service.

Table 3-10 below shows the 2012 capacity increases for the top 25 regional airline operators worldwide.

Table 3-10: Top 25 Regional Airlines Worldwide in 2012

		Traffic Capacity (RPK millions)			
Rank	Operator	2012	% chg YoY	Country	Airline group majority ownership
1	Express Jet	25,548	-5%	USA	SkyWest
2	Sky West	22,846	16%	USA	
3	American Eagle	15,484	23%	USA	AMR American Airlines
4	Shandong Air	13,600	15%	China	Air China
5	Endeavour Air	11,223	7%	USA	Delta
6	Republic Airlines	7,892	19%	USA	
7	Air Canada Jazz	6,596	-3%	Canada	Air Canada
8	Shuttle America	5,845	-6%	USA	
9	Tianjin Airlines	5,833	6%	China	Hainan Airlines
10	Lufthansa CityLine	5,250	11%	Germany	Lufthansa
11	Mesaba /Pinnacle Airlines*	5,168	53%	USA	Pinnacle Airlines
12	Compass Airlines	4,765	-9%	USA	Delta
13	Aeromex Connect	4,335	26%	Mexico	Aeromexico
14	KLM Cityhopper	4,024	-17%	Netherlands	KLM
15	Trip	3,890	11%	Brazil	Azul
16	GoJet	3,453	26%	USA	
17	Qantas Link	3,404	6%	Australia	Qantas
18	Air Wisconsin	3,368	10%	USA	
19	Horizon Air	3,362	-2%	USA	
20	Chengdu Airlines	3,150	25%	China	
21	Chang an Airlines	3,147	-4%	China	Hainan Airlines
22	Iran Aseman Airlines	3,125	3%	Iran	
23	PSA Airlines	3,048	8%	USA	US Airways
24	Taimyr Air	3,015	35%	Russia	
25	TACA Peru	2,963	66%	Peru	Avianca TACA

Source: Flight Global

Note: Flybe has been included in the Low Cost Carriers analysis as the airline is a member of the European Low Fare Airlines Association (ELFAA)

3.5.1 United States

The U.S. remains the largest market for regional airline services and saw significant consolidation in 2012 with the amalgamation of Express Jet and Atlantic Southeast Airlines as part of the SkyWest group – the largest regional airline grouping in the United States and the World.

In general, the U.S. regional airlines as a collective experienced growth in capacity in 2012 over 2011, as the effects of mergers worked through and some mainline capacity was moved to regional partners. Mesaba Airlines merged with the Pinnacle Airlines group on 4th January 2012 with all operations migrating to the Pinnacle Airlines Operations certificate in July. This accounts for the 53% increase in RPKs for the combined entity.

AMR Corps' American Eagle operation was one of the successes of 2012, posting a significant 23% increase in RPKs helping to feed mainline partner American Airlines' services.

3.5.2 Europe

According to Flightglobal (Table 3-10), in 2012, two European regional carriers (Lufthansa's CityLine and KLM's Cityhopper) existed in the Top 25 regional airlines worldwide. Air France subsidiary Regional Compagnie Aerien is a significant provider of capacity in the European regional market, but does not make the top 25 global rankings, recording 2.53 billion RPKs in 2012. Tyrolean Airways, which used to have a place in the Top 25 drops out this year as all of Austrian Airlines flights were transferred to the Tyrolean Airways operating certificate.

3.5.3 Rest of the World

Outside of North America and Europe, the largest regional airline in terms of capacity (ASKs) is Air China majority-owned Shandong Airlines. It experienced an increase of 15% in RPKs during 2012 reflecting the underlying strength in the Chinese market. Shandong Airlines achieved similar growth in 2010 versus 2009 and is now one of the world's major regional players. As noted in 2011, the majority of the airlines fleet consists of Boeing 737s and as such its status as a regional airline is questionable. Chengdu Airlines from Western China posted a 25% increase in RPKs.

In South America, Aeromexico Connect remains the largest regional carrier achieving a 26% increase in scheduled capacity (RPKs). In Brazil Azul owned carrier Trip recorded at 11% increase in RPKs reflecting the continued development of the air transport market in Brazil.

Iran Aseman Airlines remained in pole position of the Africa/Middle East regional airline operators with a 3% increase in capacity (RPKs).

3.6 Low Cost Carriers

3.6.1 Overview

It should be recognised that there is no longer a fixed dividing line between legacy carriers, regional carriers and low cost carriers. Most airlines can easily be categorised into one or the other groupings, but many overlap the once-clear distinctions. Some legacy airlines offer a set of low fares on otherwise standard services, while some of the low cost carriers have begun to increase the number of legacy-style services they offer. For example easyJet now offers a flexible ticketing option and reserved seats on all flights.

Low cost carriers continue to compete almost entirely on price, although there are various ways forward being explored by different airlines. The original template for low cost airlines, Southwest, has been exploring the possibility of additional services for passengers while others, notably Ryanair, are looking to strip the service down to the absolute basic of air transport – with all other aspects of service being regarded as add-ons. These airlines share an ability to start and drop routes at very short notice; and have generally developed along a multiple base strategy where cost savings are the prime consideration and where loyalty to airports and markets is a low priority. For example Ryanair had 51 bases across Europe at the end of 2012, opening 6 new bases and but also slashing routes that do not perform, for example 8 routes were cut from the Edinburgh base in April 2012.

3.6.2 Europe

Table 3-11 below shows how the fifteen largest European low cost airlines fared in 2012 compared to 2011, in terms of available seat-kilometres.

Table 3-11: Largest fifteen European Low Cost Carriers performance in 2012

Airline	State	Available Seat-km (million) 2011	Available Seat-km (million) 2012	% increase	Increase in seat-km (million)	% share of increase
Ryanair	Ireland	108,961	112,618	3.4%	3,657	14.7%
easyJet	UK	69,889	72,172	3.3%	2,283	9.2%
Air Berlin	Germany	45,491	49,366	8.5%	3,875	15.6%
Norwegian Air Shuttle	Norway	20,846	25,389	21.8%	4,543	18.3%
Wizz Air	Hungary	16,314	17,767	8.9%	1,462	5.9%
Vueling Airlines	Spain	13,968	17,668	26.5%	3,700	14.9%
Pegasus Airlines	Turkey	11,998	14,494	20.8%	2,496	10.1%
Jet2.com	UK	8,723	9,872	13.2%	1,149	4.6%
germanwings	Germany	8,385	8,432	0.6%	46	0.6%
Transavia (Netherlands)	Netherlands	7,776	8,663	11.4%	887	11.4%
Jetairfly	Belgium	6,202	8,229	32.7%	2,027	32.7%
flybe	UK	5,627	5,748	2.2%	121	2.2%
Anadolu Jet	Turkey	5,212	4,600	-11.7%	-612	
bmibaby	UK	2,848	1,890	-33.6%	-958	-33.6%
Transavia (France)	France	2,805	2,940	4.8%	135	
Total (15)		**335,045**	**359,848**	**7.4%**	**24,811**	**100.0%**

Source: OAG

Overall, there was a significant increase of 7.4% in seat-kilometres advertised in 2012 compared to 2011, but it wasn't a growth story across Europe's low cost carriers. A decline was reported by Anadolu Jet (-11.7%), Turkish Airlines' low cost unit, but the most substantial decline was recorded by bmibaby (-33.6%) as the carrier was closed by its parent company International Airlines Group.

At the top of the rankings in Europe, both Ryanair and easyJet increased capacity in their networks by 3.4% and 3.3% respectively. Ryanair expanded services by adding 6 new bases to its network in 2012 including Baden Baden (Germany), Billund (Denmark), Budapest (Hungary), Paphos (Cyprus), Palma de Mallorca (Spain – Balearic Islands) and Wroclaw (Poland).

easyJet, Europe's second largest low cost carrier, achieved its 3.3% capacity growth by providing additional services in primarily on routes in Italy (growth of 9.3%), France (8.2%), Switzerland (7.2%) and the UK (4.7%). easyJet further cemented it's position at London Gatwick in 2012 – now accounting for 46% of slots held at the airport. Gatwick is also the airline's largest base with 96 routes served.

Four LCC's in Table 3-11 achieved year-on-year ASK growth greater than 20% in 2012. Jetairfly (+32.7%) recorded a significant expansion of services from Belgium to Greece, Morocco and Spain, and also expanded its France-Morocco operations.

Norwegian Air Shuttle (+22%) saw growth driven by expansion in the Norway and Finland domestic markets, with international services between Scandinavia and Spain also a key growth area in 2012, compared to 2011.

Pegasus Airlines (+21%) gained rapid expansion in the Turkish domestic market, which was supported by solid growth in international services, led by significant increase in capacity into the Cypriot market.

It was a similar story for Vueling Airlines, where significant expansion in its home market, Spain, was supplemented by growth on intra-European routes between Spain and France, Germany and Denmark.

The European Low Fares Airline Association (ELFAA) provides more detailed operating figures for its ten member carriers:

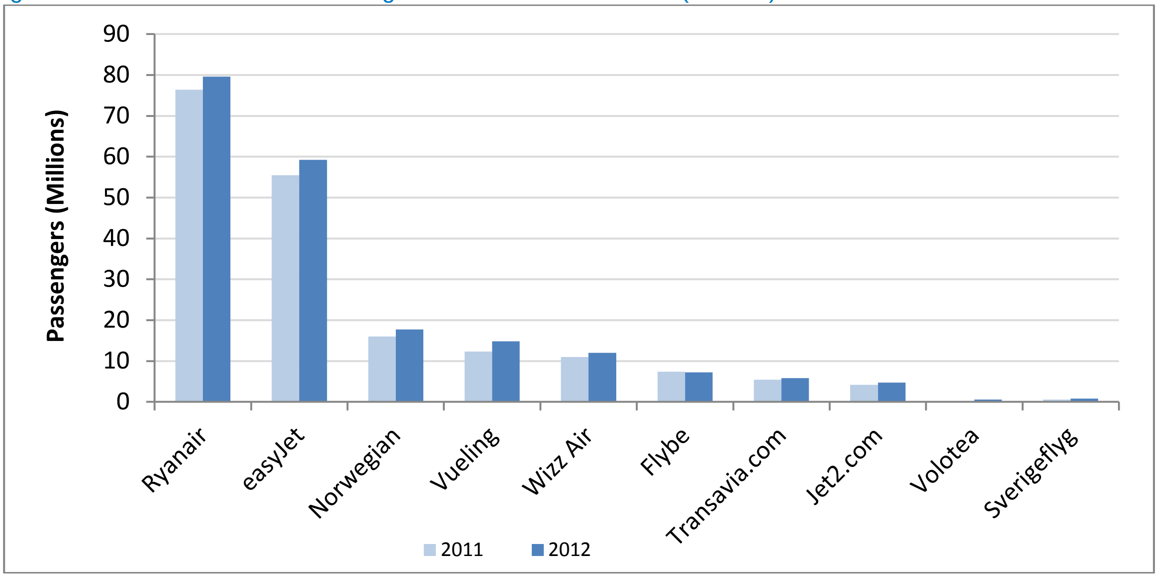
Table 3-12: ELFAA Members 2012 Data

		Pax (mill)	PLF %	Countries served	Destinations served	Routes	Daily flights	Fleet size	Average Fleet age	Employees
Ryanair	Ireland	79.6	82.0	28	174	1,500	1,500	305	3.0	8,500
easyJet	UK	59.2	88.9	33	137	638	1,200	213	4.0	8,446
Norwegian	Norway	17.7	80.0	33	125	335	400	69	6.0	2,550
Vueling	Spain	14.8	77.7	18	58	92	240	53	7.8	1,692
Wizzair	Hungary	12.0	85.7	29	83	254	215	39	3.3	1,500
flybe	UK	7.2	57.7	15	73	161	514	98	4.6	3,300
transavia.com	Netherlands	5.8	89.8	25	112	146	117	31	8.5	1,218
Jet2.com	UK	4.7	88.4	22	54	196	115	43	21	1,885
Sverigeflyg	Sweden	0.8	73.0	8	20	24	60	10	16.1	140
Volotea	Spain	0.6	N/A	9	54	83	N/A	9	N/A	230
Total 2012		**202.4**	**83.2**				**4,361**	**870**	**5.2**	**29,461**
Growth 2012 vs. 2011		**7.2%**	**-0.2%**				**0.5%**	**9.4%**		**0.4%**

Source: ELFAA

The passenger numbers are shown graphically in Figure 3.10 below and show convincingly the importance of the two main carriers, Ryanair and easyJet who combined account for 68.6% of total passengers carried by Low fare airlines in Europe.

Figure 3.10: ELFAA Airlines Passenger numbers 2012 vs. 2011 (millions)



Source: ELFAA

Passenger growth at 7.2% for ELFAA members was above the lower growth of the legacy carriers, with all remaining members showing increases or flat growth. The number of aircraft operated by these nine airlines grew by 9.4% in 2012, with the composition of the ELFAA airlines fleet shown in Table 3-13.

Table 3-13: ELFAA Airline Fleets

	2011	2012	% var.
Jets			
A320 family	283	305	7.8%
B737-300	37	37	-0%
B737-700	12	10	-16.7%
B737-800	358	390	8.9%
B757-200	12	11	-8.3%
EMB190/195	14	26	85.7%
EMB170/75	6	11	83.3%
Boeing 717	0	9	100%
Subtotal	**722**	**799**	**10.7%**
Turboprops			
DH8-400	50	47	-6.0%
ATR 42	2	2	0%
ATR 72-500	14	15	7.1%
SF 2000	2	2	0.0%
SF 340	4	4	0.0%
BAE ATP	0	1	100%
Subtotal	72	70	-2.8%
Total	**794**	**870**	**9.6%**

Source: ELFAA

The general trend among low cost carriers was for fleet expansion in 2012.easyJet augmented its Airbus A319 fleet with larger Airbus A320 aircraft to provide additional capacity at its largest base, London Gatwick. Flybe also continued to increase its fleet by adding further Embraer E-jets almost doubling the size of the E-jet fleet.

The most significant developments for individual European LCC airlines in 2012 were as follows:

- Volotea, a new low cost airline commenced operations on April 5th 2012 initially based at Venice Marco Polo Airport before rapidly expanding to open bases at Nantes (1st June) and Ibiza (15th June). The airline was founded by Vueling founders Carlos Muñoz and Lázaro Ros and operates a fleet of 14 Boeing 717 aircraft as at July 2013. The airline has a goal of “providing direct service and economic benefit to smaller, secondary cities in Southern Europe while avoiding the hubs of well-established carriers.”

- easyJet (United Kingdom) continued to increase the size of its fleet and range of destinations by opening two new bases at Nice and Toulouse airports in Southern France. The airline also opened a new base at London Southend Airport in April 2012 with service to 9 European destinations and further expansion planned for 2013. easyJet also broke into the top 25 airlines by revenue in 2012 and posted an annual profit of US$404m, up from US$362m in 2011.
- Ryanair (Ireland), the largest European low cost carrier, continued its practice in 2012 of shedding and adding routes with a frequency unrivalled by its competitors. After the collapse of Hungarian national carrier Malev, Ryanair moved quickly to establish a base at Budapest Airport which opened in February 2012. Ryanair also opened a base at the Cypriot airport of Paphos.
- Both Ryanair and easyJet begun to offer reserved seating for passengers at an additional cost in 2012. Previously, low cost airlines provided unreserved seating but this has now changed with plans for easyJet announcing in November 2012 that all seating will be allocated with customers paying to select a specific seat at boking if they wish.

3.6.3 Rest of the World

Table 3-14 below shows the 25 largest non-European airlines categorised as low cost by Mott MacDonald, showing how advertised seat-kilometres have changed from 2011 through to 2012.

Table 3-14: Top 25 Largest Non-European Low Cost Carriers by capacity in 2012

		Available Seat-km (billion)				
Airline	**State**	**2011**	**2012**	**% increase 2012/11**	**Increase in seat-km**	**% share of increase**
Southwest Airlines[15]	U.S.	167,650	171,783	2.5%	4,133	8.1%
jetBlue Airways	U.S.	60,796	65,001	6.9%	4,205	8.3%
VARIG-GOL Airlines	Brazil	48,043	44,731	-6.9%	-3,312	-6.5%
Lion Air	Indonesia	30,436	37,687	23.8%	7,251	14.2%
WestJet	Canada	33,871	35,668	5.3%	1,797	3.5%
Virgin Australia	Australia	28,485	34,928	22.6%	5,813	12.6%

[15] Southwest Airlines and AirTran Airways continued to operate independently through 2011, despite merger in May 2011.

Airline	State	Available Seat-km (billion) 2011	2012	% increase 2012/11	Increase in seat-km	% share of increase
AirTran Airlines	U.S.	39,880	34,813	-12.7%	-5,067	-9.9%
Jetstar Airlines	Australia	30,194	33,638	11.4%	3,444	6.8%
Air Asia	Malaysia	25,292	27,721	9.6%	2,429	4.8%
IndiGo Airlines	India	16,100	23,256	44.5%	7,156	-4.5%
Frontier Airlines	U.S.	23,630	21,356	-9.6%	-2,274	14.0%
Virgin America	U.S.	15,444	20,341	31.7%	4,897	9.6%
Spirit Airlines	U.S.	15,111	18,506	22.5%	3,395	6.7%
Volaris	Mexico	13,233	15,079	14.0%	1,846	3.6%
Cebu Pacific	Philippines	12,617	14,292	13.3%	1,675	3.3%
Air Asia X	Malaysia	14,272	13,522	-5.3%	-750	-1.5%
Air Arabia	U.A.E.	12,216	12,935	5.9%	719	1.4%
Flydubai	U.A.E.	8,751	12,431	42.1%	3,680	7.2%
Spring Airlines	China	8,796	11,355	29.1%	2,559	5.0%
Azul Airlines	Brazil	8,799	11,244	27.8%	2,445	4.8%
Allegiant Airlines	U.S.A.	9,253	10,814	16.9%	1,561	3.1%
Thai Air Asia	Thailand	8,875	10,595	19.4%	1,720	3.4%
Spice Jet	India	10,149	9,475	-6.6%	-674	-1.3%
Interjet	Mexico	7,526	9,190	22.1%	1,664	3.3%
Total (25)		**641,818**	**684,986**	**7.8%**	**50,942**	**100.0%**

Source: OAG

The expansion of advertised seat-kilometre output by 7.8% in 2012 is slightly above the increase by European low cost carriers. The most dramatic increases were by IndiGo Air (45%) and FlyDubai (42%), two relatively new and expanding low cost carriers. IndiGo recorded the single largest capacity increase of the carriers in the top 25 as it continued to take market share from mainline competitors such as Air India and stepped in to fill the void left by Kingfisher Airlines on some routes.

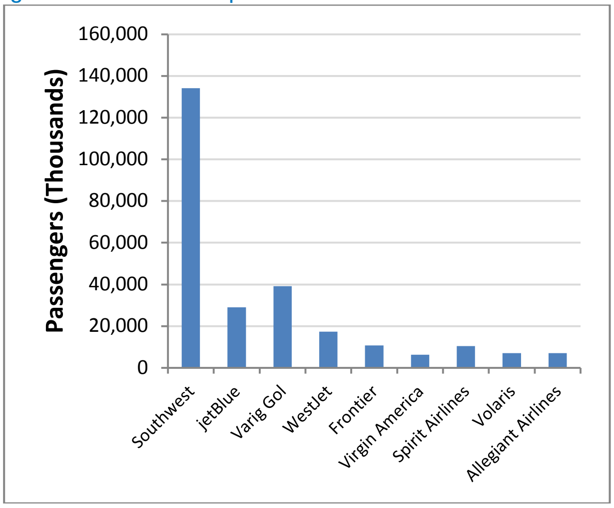
The effect of mergers impacted the US market with the world's largest Low Cost Carrier Southwest Airlines increasing ASKs by 2.5% but its subsidiary Air Tran reducing ASKs by 12.7%. This resulted in an overall net loss of seats as duplication on certain routes is removed. Virgin America also witnessed a 31.7% increase in ASKs as the airline bolstered service on its key trunk routes while opening new services to Anchorage, Washington Ronald Regean, San Jose, Austin and New York (Newark). jetBlue remains the second largest carrier in the top 25 after Southwest and increased ASKs by 6.9% in 2012 and recorded a profit of US$421.

The largest Brazilian low cost carrier, GOL, reduced available ASKs by 6.9% in 2012. This is likely a bi product of the merger with WebJet in 2011 which will have seen combined capacity reduce slightly as a result.

In Asia Pacific, Air Asia increased ASKs by 9.6%, but its long haul subsidiary Air Asia X reduced ASKs by 5.3%. The airline cancelled all routes to Europe in 2012 citing the increased costs of operating the services and punitive taxes, particularly in the UK. Air Asia X previously operated to London and Paris.

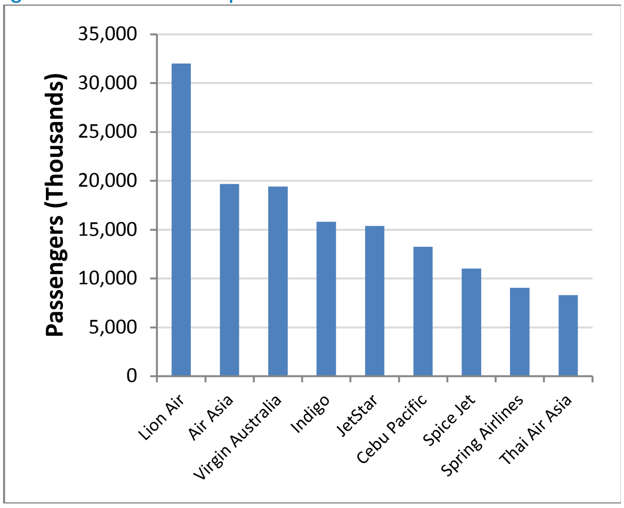
In terms of passenger numbers and growth, Figure 3.11 and Figure 3.12 show the Top 10 Low Cost Carriers in 2012 for the Americas and Asia Pacific regions.

Figure 3.11: 2012: Top 10 LCCs: The Americas



Source: Flight Global

Figure 3.12: 2012: Top 10 LCCs: Asia Pacific



Source: Flight Global

3.7 Charter Airlines

3.7.1 Overview

Table 3-15 below highlights a (limited) selection of major worldwide charter airlines in 2012 in comparison with 2011. This list is not comprehensive and is based solely on those charter airlines where data was available in the public domain at the time of publication. Nevertheless, this list is representative of the general charter industry growth in 2012.

Table 3-15: Selected Worldwide Charter Airlines Traffic Growth: 2012 vs. 2011

		Passengers (millions)			Revenue Passenger Kms (millions)		
Charter Airline	Region	2012	2011	% chg '12 vs '11	2012	2011	% chg '12 vs '11
Thomson Airways	EU-27	10.70	11.05	-3.2%	32,073	32,969	-2.7%
Thomas Cook Airlines	EU-27	6.78	7.97	-14.9%	22,541	27,418	-17.8%
SunExpress	Europe	6.42	7.25	-11.5%	10,398	11,750	-11.5%
Condor	EU-27	6.60	6.17	7.0%	23,779	23,574	0.9%
Monarch Airlines	EU-27	6.30	5.93	6.2%	14,854	14,277	4.0%
Air Transat	N. America	3.86	3.64	6.0%	18,522	16,626	11.4%
Omni Air International	N. America	0.74	0.97	-23.7%	3,211	4,578	-29.9%
World Airways	N. America	0.18	0.42	-57.1%	1,269	3,548	-64.2%

Source: Flight Global

In common with 2011, Thomson Airways and Thomas Cook Airlines remain the largest charter carriers in the world. Both airlines recorded a decline in passenger numbers in 2012 compared to 2011. German charter carrier Condor, Monarch Airlines from the UK and Canadian airline Air Transat all recorded an increase in passenger numbers and RPKs. Thomas Cook Airlines in particular has been suffering from financial difficulties and undertook significant restructuring throughout 2012.

Many European charter airlines - including Thomson, Monarch, Condor, Pegasus - also operate scheduled services. One of the reasons for this has been European deregulation, whereby any airline operating charter flights on intra-European routes and increasingly to other neighbouring destinations such as Morocco, may advertise series charter flights as scheduled services – even though the number of seats made available to the true scheduled market may be negligible.

Given the limited nature of traffic statistics covering the European charter market for 2012, a useful proxy is available from the UK CAA which provides a comparison between 2012 and 2011 of charter passenger traffic both in total and by destination from UK airports.

Table 3-16: Charter Passengers at UK Airports 2012 vs. 2011

	2011	2012	% change	% share 2012
Short-Haul				
European Union - West	13,243,596	12,535,515	-5.3%	65.6%
European Union - East	346,553	346,880	0.1%	1.8%
Other Western Europe	3,541,493	2,720,282	-23.2%	14.2%
Other Eastern Europe	1,941	10,503	441.1%	0.1%
North Africa	1,497,203	1,745,452	16.6%	9.1%
Subtotal	18,630,786	17,358,632	-6.8%	90.9%
Long-Haul				
Other Africa*	184,683	142,605	-22.8%	0.7%
Near, Middle East	27,104	16,112	-40.6%	0.1%
Asia, Australasia	180,151	131,664	-26.9%	0.7%
North America	446,734	388,700	-13.0%	2.0%
Caribbean, Latin America	1,327,610	1,065,626	-19.7%	5.6%
Subtotal	2,166,282	1,737,792	-19.8%	9.1%
Total Charter	**20,797,068**	**19,096,424**	-8.2%	100.0%
Total Scheduled	159,811,329	163,208,202	2.1%	
Total all international passengers	181,369,094	183,092,116	1.0%	
Charter % share of international pax	**11.5%**	**10.4%**		

Source: UK CAA

In the UK market at least, the charter industry declined by 8.2% in 2012, following a contraction in 2011 of 3.9%. Comparing this with scheduled traffic to and from the UK growing at 2.1%, and total international passengers at 1% in 2012, the decline in charter traffic is significant – highlighted by its continued cut in market share of UK air passenger traffic. Part of this decline has been driven by Monarch Airlines continuing to alter many of its former 'charter' flights to scheduled services.

Table 3-16 demonstrates that, charter services remain strongest on routes to North Africa and Eastern Europe. For North Africa in particular, the strong preponderance of Inclusive Tour package holidays and no existing open skies agreement for many of the North African countries means that low cost carrier penetration is comparatively low and there are greater opportunities for growth.

All long-haul charter markets were down year-on-year as long haul tourism destinations reported the impact of increasing UK Air Passenger Duty reducing the competitiveness of these destinations. Thomson Airways did however announce that it intended to serve additional long haul destinations in future upon delivery of their fleet of Boeing 787 aircraft.

3.8 Cargo Airlines

3.8.1 Air Cargo Demand

The IMF recorded a marked slow-down in growth of world trade volumes (goods and services) in 2012 (2.5%), compared to 2011 (6.0%). Again, growth in world trade volumes was two-speed with Advanced Economies achieving less growth than Emerging and Developing Economies for both imports and exports. According to IATA[16], around 35% of world trade by value is transported by air.

Table 3-17: World Trade Volumes (Goods and Services)

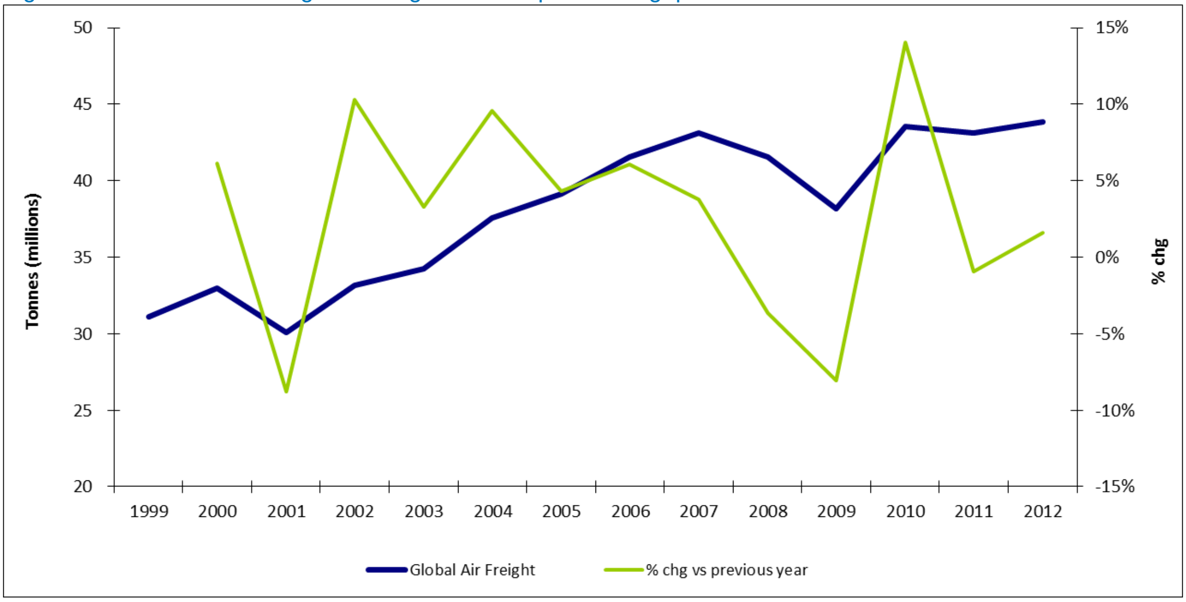
	Actual		Projection	
% change	**2011**	**2012**	**2013**	**2014**
World Trade Volume (Goods and Services)	6.0	2.5	3.6	5.3
Imports – Advanced Economies	4.7	1.0	2.2	4.1
Imports – Emerging and Developing Economies	8.6	4.9	6.2	7.3
Exports – Advanced Economies	5.6	1.9	2.8	4.6
Exports – Emerging and Developing Economies	6.4	3.7	4.8	6.5

Source: IMF World Economic Outlook (April 2013)

Against the background of slow-down in the global economy and trade performance, growth in air freight demand was similarly dampened in 2012. Figure 3.13 shows historical air freight throughput at ACI-reporting airports over the last decade.

[16] IATA Director General, IATA World Cargo Symposium, March 2011

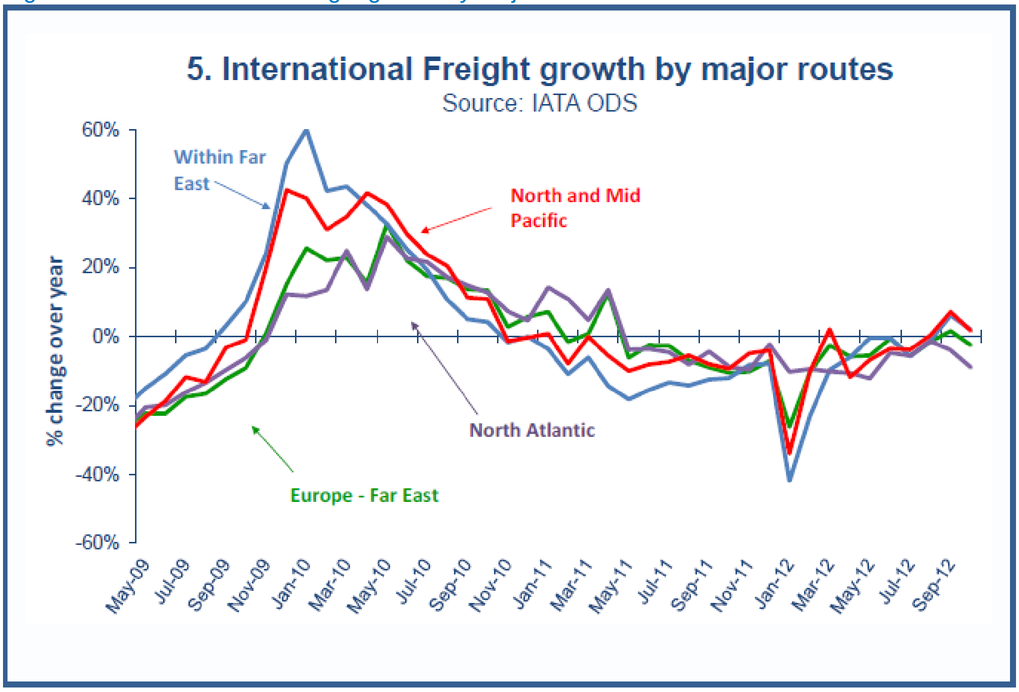
Figure 3.13: Global Air Freight Tonnage – ACI Airport Throughput



Source: ACI

In common with 2011, 2012 saw a decline in cargo markets. IATA reported that a decline of 1.5% in Freight Tonne Kilometres was witnessed in 2012. IATA attributes this reduction to a sharp slowdown in Global Trade volume growth and shifts in the commodity mix favouring sea transport over air.

Figure 3.14: International Freight growth by major routes



Source: IATA ODS

The beginning of 2012 saw a reduction in International freight in most markets, although the decline on the North Atlantic was not as pronounced as in other regions. A recovery was evident just after the dip in January 2012 but aside from a small positive variance in the North and Mid Pacific markets between July and September 2012 all markets remained challenging

IATA noted that growth was experienced by airlines in Africa and the Middle East, but routes between North America and Central America remained in decline throughout much of the year. There was a notable recovery in the latter months of 2012 with significant growth experienced in the North America – South America, within South America and Africa – Middle East. All three are rapidly developing marketplaces with expanding based airlines.

In its air cargo market analysis for 2012[17], IATA suggests that the business environment for air cargo declined in 2012 again because of flat trade indicators and confidence. The deepening Eurozone crisis also further reduced demand against a backdrop of general weakness of the economies of developed countries.

3.8.2 North America

The U.S. is home to the world's two largest air cargo carriers FedEx and UPS. Together, they operate around one third of the global cargo aircraft fleet and accounted for over 50% of freight tonne-kilometres operated by U.S. carriers in 2012.

Table 3-18: Selected North American Airlines: Freight Tonne-Kilometres (FTKs) [millions] 2012 v 2011

Airline	2012	% chg vs 2011
FedEx	16,108	0.0
UPS	10,416	2.2
Atlas Air	5,110	9.2
Delta Air Lines	3,482	-0.3
American Airlines	2,585	-1.2
United Airlines	3,590	-7.1
Southern Air	2,101	4.2
Polar Air Cargo	1,676	-5.9
Kalitta Air	1,798	1.4
US Airways	501	-9.6

Source: Airline Business August 2012

Table 3-18 shows a selection of North American airlines operating within all segments of the air cargo market. These carriers achieved mixed growth in 2012 compared with the previous year. Cargo integrator Fedex recorded marginal growth in 2011, while UPS reported a 2.2% increase in Freight Tonne Kilometres. This is slightly below the growth rates of 2011 but the positive growth still represents an achievement given the environment. The integrators operate global networks so low demand in one region can be offset by increased demand in another.

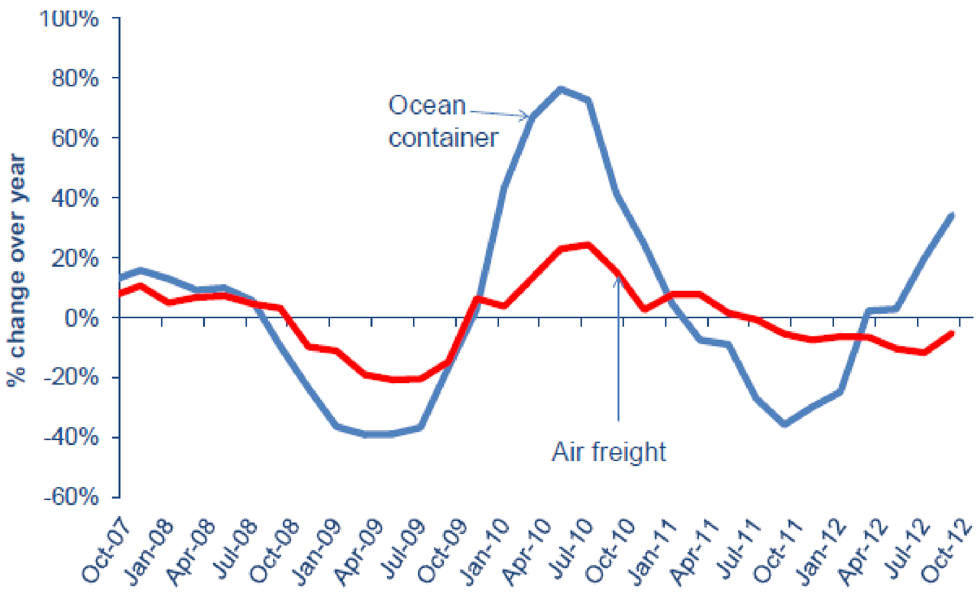
[17] Cargo E-Chartbook Q4 2012; IATA

The four large legacy airlines all recorded declines in 2012 with Delta recording a reduction of 0.3%, American 1.2%, United 7.1% and US Airways 9.6%. Cargo airline Atlas Air achieved significant growth of just over 9.2% and Kalitta Air an increase of 1.4%.

3.8.3 Europe

The Association of European Airlines (AEA) recorded a decline in annual freight traffic (FTK) for its member airlines of 3.4% in 2012, well under the 2% growth achieved in 2011. The Eurozone downturn in as well as increased competition from sea freight impacted on freight volumes during 2012. The graph below shows the differing growth rates between air freight and sea freight and expresses the difference in the two modes.

Figure 3.15: Ocean Container vs. Air Freight Growth October 2007 – October 2012.



Source: IATA, Drewery, CASS

This slow growth rates experienced in 2012 was primarily as a result of the continued low demand for manufactured goods and falling business confidence arising from the continuing challenges in the Eurozone economies during the year. The slowdown particularly impacted airlines in Asia who tend to carry large amounts of consumer goods to Europe.

Table 3-19: AEA Airlines Cargo Performance 2012

REGION	Freight Traffic FTK (millions)	TFTK % chg vs prev. yr.
Domestic (1)	63	-8.5%
Cross-border Europe (2)	750	-1.9%
Total Europe (1+2)	813	-2.9%
Europe - North Africa (3)	177	11.5%
Europe - Middle East (4)	1,134	0.5%

REGION	Freight Traffic FTK (millions)	TFTK % chg vs prev. yr.
Intl Short/Medium Haul (2+3+4)	2,062	0.5%
North Atlantic (5)	9,722	-3.9%
Mid Atlantic (6)	1,955	3.3%
South Atlantic (7)	2,363	-11.0%
Europe - Sub Saharan Africa (8)	2,903	-4.8%
Europe - Far East/Australasia (9)	13,296	-1.8%
Total Long Haul (5 to 9*)	30,621	-3.6%
Total Intl (2 to 9*)	32,682	-3.4%
Total Scheduled (1 to 9*)	32,746	-3.4%

Source: AEA (Freight traffic is measured in FTK (Freight Tonne-Km) on passenger and all-cargo services, excluding mail. *Long haul region 'Other' is not shown above, but is included in the total.)

AEA carriers achieved a decline in freight traffic of 3.6% on long-haul international routes compared with an increase of 0.5% decline on international short and medium-haul routes, although the latter only accounted for 6% of total member airline traffic. The North Atlantic routes, accounting for 30% of FTK traffic, achieved a 3.9% decline while, the largest market, Europe to Far East/Australasia (40% of total), recorded a decline of 1.8%.

Table 3-20: Selected European Airlines: Freight Tonne-Kilometres (FTKs) [millions] 2012 v 2011

	2012	% chg vs 2011
Air France-KLM	10,577	-6.3
Lufthansa Cargo	8,727	-8.0
Cargolux	4,800	-4.7
British Airways	4,891	2.0
Turkish Airlines	1,877	27.6
Virgin Atlantic Airways	1,461	-4.4
Swiss	1,452	8.9
Iberia Group	1,187	-12.9
Scandinavian Airlines	501	3.8

Source: Flight Global Airline Business August 2012

Lufthansa Cargo saw an 8.0% reduction in Freight Tonne Kilometres with Cargolux seeing a 4.7% decline. Qatar Airways announced at the end of 2012 that it intended to sell its 35% stake in Cargolux.

Europe’s largest freight carrier, Air France-KLM posted a freight traffic decline of 6.3% over 2011. The group recently reduced its all-cargo aircraft fleet and weaker demand in the Eurozone has hurt freight loads.

In addition to air cargo being carried by scheduled network carriers on freighter aircraft or in the belly-hold of passenger aircraft, the air cargo ‘Integrators’ (or express carriers) continue to hold significant market share of air mail deliveries across Europe. The two largest such operators in Europe are DHL and TNT Airways. DHL has two subsidiaries based in the EU – DHL Air based at East Midlands Airport in the UK, and European Air Transport (EAT) based in Leipzig, Germany. In 2012, DHL Air achieved 588 million FTKs with growth of 2.2% over 2011, operating a pan-European delivery service with a fleet of 28 customised (mostly B757) aircraft. EAT's fleet size totalled 29 in 2012, a mix of A300B4-600 and B757-200 aircraft. DHL also owns half of Aerologic, a joint venture alongside Lufthansa Cargo, that operates a fleet of 8 B777-200s. TNT Airways, based in Belgium, recorded 1,222 million FTKs in 2012 with impressive growth of 8.8% compared to 2011, operating across Europe and also longhaul services with a fleet of 31 aircraft.

3.8.4 Asia Pacific

In 2012, the major Asia Pacific airlines with freight traffic generally suffered declines, as shown in Table 3-21 below. As a collective, the airlines shown in the table recorded a drop in FTKs of 3.3% compared to 2011.

Table 3-21: Selected Asia Pacific Airlines: Freight Tonne-Kilometres (FTKs) [millions] 2012 v 2011

	2012	% chg vs 2011
Cathay Pacific	8,615	-8.5
Korean Air	8,279	-9.3
Singapore Airlines	6,764	-6.0
China Airlines	4,828	-14.9
China Eastern Airlines	4,701	6.3
EVA Air	4,472	-8.4
Air China	4,554	3.1
Asiana Airlines	4,209	10.3
China Southern Airlines	3,862	16.9
All Nippon Airways	2,975	10.1
Thai International Airways	2,653	-4.1
Qantas	2,207	-4.1
Malaysia Airlines	1,885	-8.9
Japan Airlines	1,699	14.5
Total Selected Airlines	61,703	-3.3

Source: Flight Global Airline Business August 2012

Cathay Pacific and Korean Air, the two largest cargo-carrying legacy airlines in the region, both saw FTKs fall over 5% from 2011 levels. Interestingly, Asiana, South Korea's second airline, posted a significant increases of 10% in 2011. The two largest Chinese carriers, China Eastern and China Southern also recorded growth of 6.3% and 16.9%.

Taiwan based China Airlines recorded the largest percentage decrease of 14.9% and falls were also recorded for Eva Air, Thai International, Qantas and Malaysian Airlines. Japan Airlines also recorded growth after years of successive declines in cargo loads.

3.8.5 Latin America

The Air Cargo industry in Latin America is a fraction of that of Europe, North America and Asia Pacific.

Air Cargo traffic (FTKs) for selected airlines in the region is displayed in Table 3-22. Collectively, the major carriers achieved growth of 9.7% in 2012 compared to 2011.

Table 3-22: Selected Latin American Airlines: Freight Tonne-Kilometres (FTKs) [millions] 2012 v 2011

	2012	% chg vs 2011
LAN Airlines	3,600	-0.3
TAM Linhas Aereas	795	-9.1
Avianca	695	100
Total Selected Airlines	5,090	9.7%

Source: Flight Global Airline Business August 2012

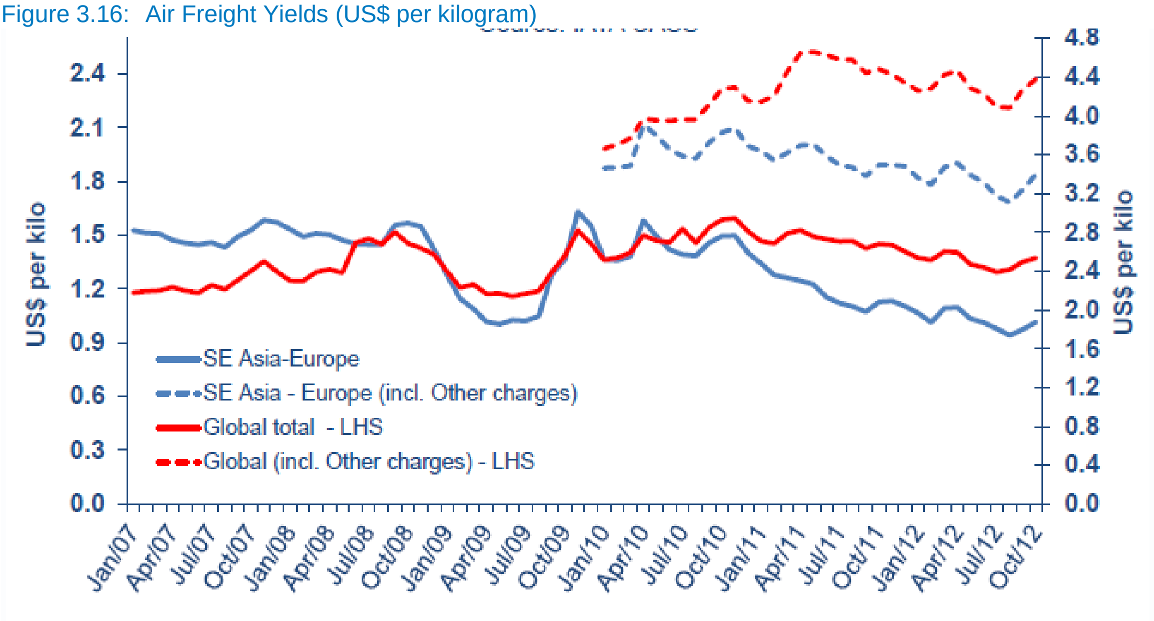
LAN Airlines reported a total of 3,610m freight tonne-kilometres in 2011, a slight decline of 0.3% over 2011. For 2013, the effects of the LAN/TAM merger will be realised. TAM itself reported a total of 795m FTKs in 2012, a reduction of 9.1%. Avianca increased the level of freight traffic considerably from 152m FTKs to 695m FTKs. This helped place the Latin American region into growth when compared with 2012. According to industry analysis[18] LAN's cargo division raised US$1.57bn in revenue in 2011 (+23% growth over 2010), and accounted for nearly 30% of total airline revenues.

3.8.6 Air Cargo Yields & Revenue

A trend of weakening yield growth continued through 2012 (see Figure 3.16 below), due to a weakness in demand and excess capacity in the market. Revenues also continued to suffer, particularly throughout the early months of 2012, while oil prices continued to fluctuate. Fleet expansion in the middle part of the year also placed downward pressure on yields and load factors.

According to IATA's survey of cargo airline heads, the outlook for 2013 is more positive.

Figure 3.16: Air Freight Yields (US$ per kilogram)

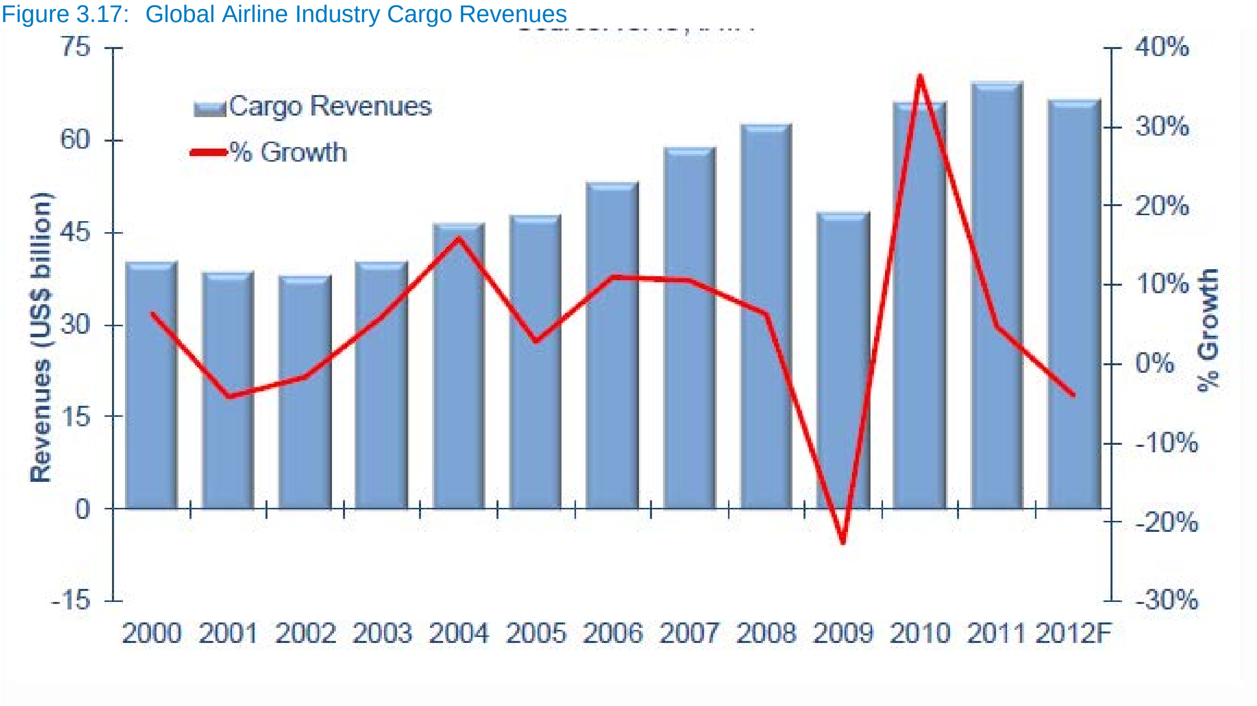


Source: IATA CASS (Note: LHS = Long Haul Services; Other charges include handling charges, dangerous goods fees, special charges, fuel surcharges, security etc.)

[18] Airline Business; World Airline Rankings – Financial; August 2012

The Southeast Asia to Europe market remained on a downward trend for the majority of 2012, albeit with a slight upturn in September and October. In common with 2011, weaker demand for Asian manufacturing hit cargo volumes substantially.

Figure 3.17: Global Airline Industry Cargo Revenues



Source: IATA

Following revenue growth in 2011, 2012 was the first year where a decline in revenues is expected as a result of the downward pressure on the market.

4. Airports

4.1 Introduction

This chapter provides an analysis of the airport industry performance and development in 2012. Firstly, airport traffic (passenger and movements) is examined by world region, and at major European airports. This is followed by a financial performance analysis for selected major airport groups, and the main airport developments that occurred in 2012 are reported and examined, in a European and global context.

4.2 Airport Traffic & Developments in 2012

4.2.1 Traffic

Table 4.1 provides a summary of the principal airport operating data split by world region. Passenger numbers at European airports increased by 1.8% in 2012, while traffic at the world's airports grew by 4.4%. The growth was led by the Middle East (+13%) and Asia Pacific markets (+8%). Africa saw a recovery in 2012 with a 6.1% increase (compared to the 2.3% decline in traffic during 2011).[19] The growth in mature markets such as Europe and North America was slower than in the rest of the world, evidenced by the decreasing share of world traffic held by the two regions, with Asia Pacific now taking the lead as the main world region in terms of passenger traffic.

Air freight figures show how Europe has been the worst performing region (-2.4%) in terms of flown tonnes. This can be attributed to the economic crisis affecting the continent. Middle East had the highest growth (+4.2%). Commercial air movements in Europe decreased by 1.5%, with again the Middle East achieving the highest growth (6.6%)

Table 4.1: Global Air Traffic Throughput at Worldwide Airports by Region

Region	EUR	AFR	ASP	LAC	MEA	NAM	World
Passengers 2011 (millions)	1,587.4	154.1	1,583.5	413.1	224.6	1,542.1	5,504.7
2011 share of World %	29%	3%	29%	8%	4%	28%	100%
Passengers 2012 (millions)	1,615.9	163.5	1,709.7	444.4	253.8	1,562.3	5,749.6
2012 share of World %	28%	3%	30%	8%	4%	27%	100%
% change 2012 v 2011	1.8%	6.1%	8.0%	7.6%	13.0%	1.3%	4.4%
Freight tonnes 2011 (millions)	17.1	1.8	30.7	4.8	5.7	27.0	87.1
2011 share of World %	20%	2%	37%	5%	6%	30%	100%
Freight tonnes 2012 (millions)	16.7	1.8	31.1	4.8	5.9	27.3	87.7
2012 share of World %	19%	2%	35%	6%	7%	31%	100%
% change 2012 v 2011	-2.4%	-0.3%	1.4%	0.3%	4.2%	1.2%	0.7%

[19] These statistics must be handled with care as ACI relies on the airports to report their statistics to them. This leads to a situation where some airports statistics may not be available in a specific year.

Region	EUR	AFR	ASP	LAC	MEA	NAM	World
Commercial ATMs 2011 (millions)	16.3	2.2	9.7	5.0	1.8	20.1	55.1
2011 share of World %	30%	4%	18%	9%	3%	37%	100%
Commercial ATMs 2012 (millions)	16.0	2.1	10.3	5.4	1.9	19.8	55.5
2012 share of World %	29%	4%	19%	10%	3%	36%	100%
% change 2012 v 2011	-1.5%	-1.5%	6.0%	6.3%	6.6%	-1.4%	0.8%
Pax per ATM 2011	98	72	162	82	125	77	100
Pax per ATM 2012	101	77	166	83	132	79	104

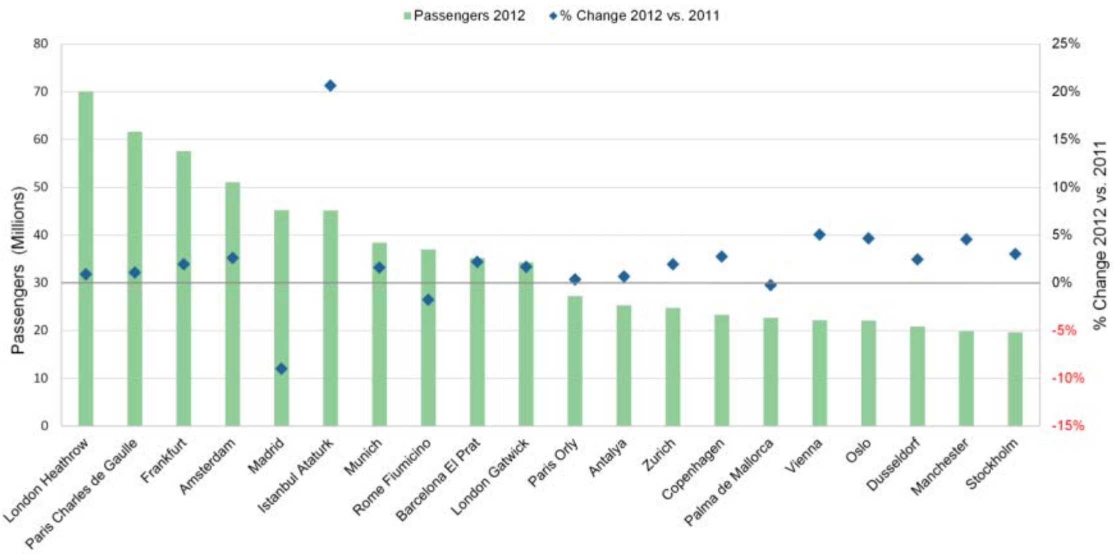
(EUR = Europe, AFR = Africa, ASP = Asia Pacific, LAC = Latin America-Caribbean, MEA = Middle East, NAM = North America)

Source: ACI World Airport Statistics 2012

Figure 4.1 shows the passenger throughput and annual growth rates at the 20 largest EU airports (ranked by 2012 passenger numbers). Except for Madrid (for the second year in a row) and Rome Fiumicino, all of the Top-20 airports have grown passenger traffic. Heading this table is London Heathrow, with 70 million passengers (+1%), in a year that saw London host the Olympic Games. Paris Charles de Gaulle and Frankfurt maintained their second and third positions.

Impressive growth was experienced by Istanbul Atatürk (+21%), benefitting from the huge expansion of Turkish Airlines. This is highly contrasting with the year-on-year growth rates of the other 19 airports which range between -9% and 5%.

Figure 4.1: Passenger Throughput at Major European Airports 2012

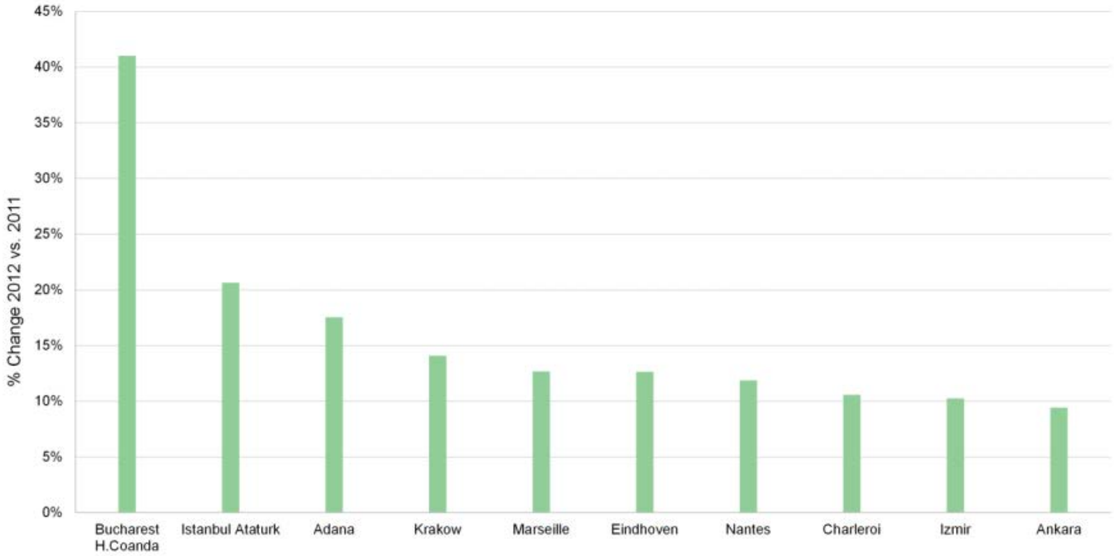


Source: ACI World Airport Statistics 2012

The top-10 and bottom-10 growing airports are illustrated respectively in Figure 4.2 and Figure 4.3. Only those European airports with over 2.5 million passengers during 2012 are considered in this analysis. The upswing in traffic at Bucharest Coanda airport is explained by the relocation of Wizzair, germanwings and Blue Air operations from Bucharest Băneasa. Combined passenger traffic at the Romanian capital airport system increased by 1.3% in 2012. Four of the top-10 positions are occupied by Turkish airports (Istanbul

Atatürk, Adana, Izmir and Ankara), showing the rapid expansion of air travel demand in the country. Eindhoven, Nantes and Charleroi airports have benefitted from the growth of low cost carriers (i.e. Vueling in Nantes, Ryanair in Charleroi, Transavia and Wizz Air in Eindhoven). Marseille passenger traffic growth increment was supported by Air France and Ryanair expansion.

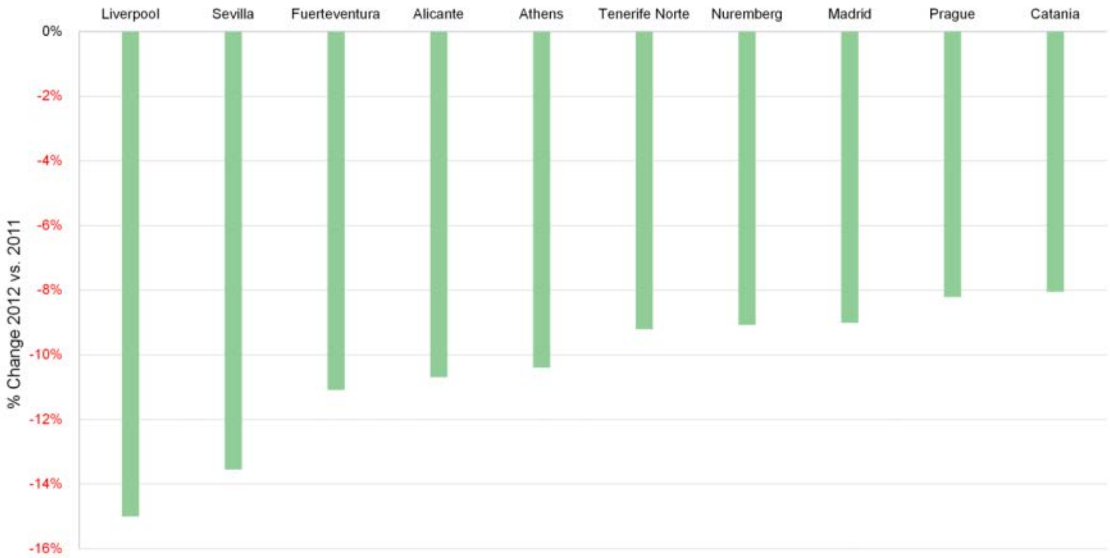
Figure 4.2: European Airports (>2.5m pax) Exhibiting the Highest Growth in 2012



Source: ACI Airport Statistics 2012

In 2012, Liverpool Airport had the highest percentage passenger decrease compared to 2011, mainly due to airlines such as easyJet and Ryanair cutting routes and frequencies in response to the continued economic downturn and impact of the Air Passenger Duty tax hitting demand. Seven out of the bottom-10 airports reported in Figure 4.3 are from the Mediterranean countries: Spain, Italy and Greece. The severe economic crises experienced in these countries impacted on airlines, contributing to the demise of Spanair and Wind Jet. This, allied to volatility in LCC capacity (mostly easyJet, Ryanair, Vueling) and charter airlines, resulted in lower traffic figures at these airports. Downsizing and restructuring of legacy carriers (Olympic Air in Greece, Czech Airlines in Czech Republic and Iberia in Spain) caused deterioration of traffic in their main-base airports (respectively Athens, Prague and Madrid).

Figure 4.3: European Airports (>2.5m pax) Exhibiting the Largest Declines in 2012



Source: ACI World Airport Statistics 2012

4.2.2 Global Airports

Table 4.2 reports the leading top-20 global airports in terms of passenger volumes for 2012. With the exception of Madrid, none of the top-20 airports has experienced a decline in passengers. While the top-3 position is unchanged, much movement was observed in the 11th to 20th positions. Out of the six airports that have lost positions during 2012, three are European and two North-American, reinforcing the view that the more mature markets are being overtaken by developing markets. While three of the six European airports occupying this table have slipped down the rankings, Istanbul Atatürk is a new entry in the top-20. Double-digit growth was experienced in some of the Asia-Pacific airports (Bangkok, Singapore and Jakarta) while Dubai sustained its expansion (+13%).

Table 4.2: World Top-20 Airports by passenger throughput 2012

Rank	City, Country	Airport Code	Total Passengers	% Change	2011 Rank	
1	Atlanta, USA	ATL	95,513,828	3%	1	=
2	Beijing Capital, China	PEK	81,929,359	4%	2	=
3	London Heathrow, UK	LHR	70,038,804	1%	3	=
4	Tokyo Haneda, Japan	HND	66,795,178	7%	5	▲
5	Chicago O'Hare, USA	ORD	66,633,503	0%	4	▼
6	Los Angeles, USA	LAX	63,688,121	3%	6	=
7	Paris Charles de Gaulle, France	CDG	61,611,934	1%	7	=
8	Dallas Fort Worth, USA	DFW	58,621,369	1%	8	=
9	Jakarta, Indonesia	CGK	57,772,762	12%	12	▲
10	Dubai, UAE	DXB	57,684,550	13%	13	▲
11	Frankfurt, Germany	FRA	57,520,001	2%	9	▼

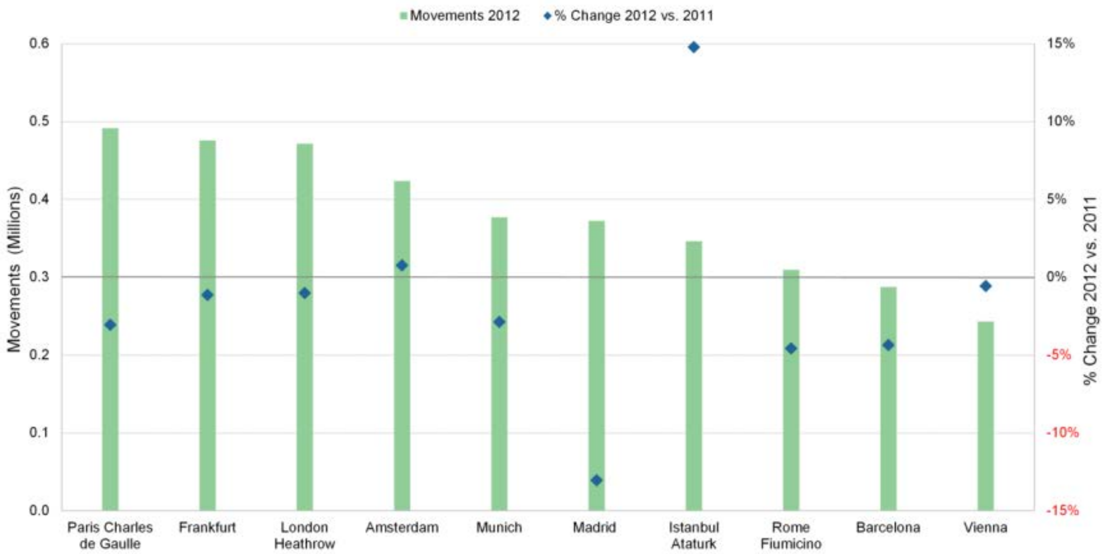
Rank	City, Country	Airport Code	Total Passengers	% Change	2011 Rank
12	Hong Kong, China	HKG	56,061,595	5%	10 ▼
13	Denver, USA	DEN	53,156,278	1%	11 ▼
14	Bangkok Suvarnabhumi, Thailand	BKK	53,002,328	11%	16 ▲
15	Singapore Changi, Singapore	SIN	51,181,804	10%	18 ▲
16	Amsterdam, Netherlands	AMS	51,035,590	3%	14 ▼
17	New York JFK, USA	JFK	49,291,765	3%	17 =
18	Guangzhou, China	CAN	48,309,410	7%	19 ▲
19	Madrid, Spain	MAD	45,176,978	-9%	12 ▼
20	Istanbul Atatürk, Turkey	IST	45,124,831	21%	30 ▲

Source: ACI World Airport Statistics 2012

4.2.3 Air Transport Movements

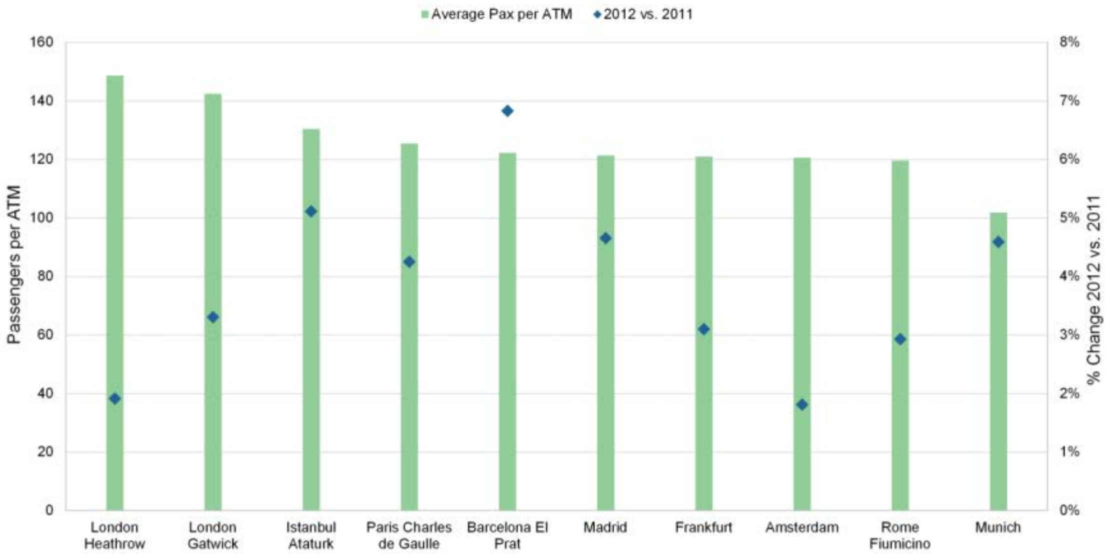
Figure 4.4 and Figure 4.5 show air transport movements and average passengers per ATM at major European Airports. The trend in growing passenger numbers is not reflected in terms of increase in air transport movements. Aside from Istanbul Atatürk (+15%) and Amsterdam (+1%), all of the ten largest airports in Europe experienced a decrease in air transport movements. Average passengers per ATM figures show an increase for all airports compared to last year, indicating capacity discipline by airlines in increasing average load factors.

Figure 4.4: Total Movements at Major European Airports 2012 vs. 2011



Source: ACI World Airport Statistics 2012

Figure 4.5: Average Passengers per ATM at Major European Airports 2012 vs. 2011



Source: ACI World Airport Statistics 2012

4.2.4 Airport Financial Results

This section details financial results (based on the most recent data available) for the airport industry as a whole and individual results from a number of the major airports and airport groups operating in Europe and the rest of the world.

The data in Table 4.3 below is sourced from the ACI Economics Report 2012, published in June 2013, based on a response from about 696 airports that collectively handled 3.76 billion passengers in 2011, or some 70% of global traffic in that year. The data relates to the financial year 2011/2012.

Table 4.3: World Airport Industry Revenues, Financial Year 2011/12 (USD billion)

	Aeronautical	Non-aeronautical	Total Revenue
Africa	1.529	0.988	2.517
Asia Pacific	14.525	14.832	29.357
Europe	25.282	16.757	42.039
Latina America-Caribbean	3.925	2.275	6.199
Middle East	n/a	n/a	4.990
North America	12.386	10.780	23.167
World	60.897	47.372	108.269

Source: 2012 Airport Economics Report

Based on the ACI survey, worldwide total airport income in 2011/2012 reached USD 108.2 billion, an increase of 2.4% on 2010/2011. While non-aeronautical income (with retail concessions, rental property and real estate income, and car parking representing almost 70% of all non-aeronautical income) is an important source of revenues for airports, the majority of revenues are obtained through aeronautical income (composed of charges levied on aircraft and passengers). The proportion of income from this source represents 57% of total income whereas non-aeronautical income and non-operating income makes up 43% of the total income. In 2011/2012 airports saw their total costs, operating expenses and capital costs rise by 1.9% compared to 2010/2011. The largest component of operating expenses is personnel cost which accounts for almost 34% of operating expenses.

Table 4.4: European Airport Industry Revenue and Costs, Reporting Year 2011

	EUR (billion)	Proportion of Revenues
REVENUES		
Total European Airport Industry Revenues	33.2	100%
Of which:		
Aeronautical	16.2	49% (59% excl. GH & Other)
Non-Aeronautical	11.2	34% (41% excl. GH & Other)
Ground-Handling Revenue	2.2	6%
Other Revenues	3.6	11%
COSTS		
Operating Expenses	19.8	60%
Capital Expenditure	9.2	28%
Capital Costs (Interest and Depreciation)	9.4	29%

Source: ACI Europe Economics Report 2012

Table 4.4 shows the main revenues and costs streams of European airport operators for the reporting year 2011.

Total revenues reached €33.2[20] billion in 2011. This is an increase of 9% on 2010, and it is commensurate with traffic growth of that year (+7.3% compared with 2010). Excluding other revenues and ground-handling revenues, aeronautical revenues accounted for 59% of total airport revenues in 2011, with non-aeronautical revenues representing 41%.

Aeronautical revenues reached €16.2 billion in 2011 (+9% on 2010). These are mainly composed of airline-related charges (levied on a per aircraft basis), and passenger related charges (levied on a per passenger basis). The ratio of airline-related to passenger-related charges has shifted since 2008 significantly towards passenger-related charges and today 67% of aeronautical revenues are generated by the passenger.

In 2011, non-aeronautical revenues at European airports amounted to €11.2 billion. The single largest non-aeronautical revenue stream is the airport retail concession, accounting for 43% of non-aeronautical revenues. It is followed by property and rent (27%) and car parking (19%). Except for rental car concessions, revenues increased in all categories in absolute numbers.

In the reporting year 2011, total operating expenses of European airports amounted to €19.8 billion (+6% compared to 2010). Since 2009 operating costs per passenger have decreased by 6%, indicating efficiency gains achieved by airports in recent years. This helped to mitigate the increase in interest costs which airports experienced and to maintain airport charges on a competitive level. The largest single cost item at European airports is staff costs (accounting for 36% of total operating costs) which have decreased by 8% compared to 2009.

20 Data for 2011 was reported in USD. All data was converted into € based on the exchange rate as of 2 January 2013 (1€ = 1.2935$)

Predicted investment in new and existing airport infrastructure has been adjusted downward (forecast capital expenditure in 2011 for 2012 was downgraded by €0.7 billion on the previous year's projections), and return to normal levels of capital expenditure are not expected by ACI Europe in the short term.

Capital costs increased by 29% between 2009 and 2011. According to ACI Europe, this happened despite a period of lower capital expenditure undertaken by airports. Much of this rise was driven by increasing interest costs (+45% between 2009 and 2011).

Overall, operating expenses represent 66% of total costs for airports. Capital costs are 31% of total while the remaining 3% are due to taxes and other fees.

In 2011 the entire airport industry made an overall net profit of €3.3 billion. According to ACI, only the larger and medium sized airports are generally able to generate reasonable profits. Those European airports handling fewer than 5 million passengers per annum tend to make very small returns compared to the capital invested. In 2011 a representative sample of European airports reported an average ROCE of 4.3%.

Europe

For airport groups which have produced full year financial results, the vast majority of major European airport groups have posted profits or improved figures compared with 2011.

AENA

AENA is the State airport group owner and operator of 47 Spanish airports. According to AENA [21], it registered the following financial performance in 2012:

- Turnover: EUR3.3 billion, +2.2%;
- Staff costs: EUR1.1 billion, +12.5%;
- Group debt, end of 2012: EUR12.8 billion, -3.5%.

AENA noted the 2.2% increase in turnover is "particularly significant" given the economic conditions in the country, with a 5% year-on-year decline in passengers and a 10% year-on-year decline in operations.

Amsterdam Schiphol Group

The Schiphol Group is the owner and operator of Amsterdam Schiphol Airport, Rotterdam, The Hague, Eindhoven and Lelystad regional airports. It also has international interests in Paris Charles de Gaulle (with which it has a strategic alliance known as "HubLink" and an 8% cross-shareholding), New York JFK (operator of Terminal 4) and at airports in Australia, Italy, Hong Kong, Aruba and Sweden. Passenger traffic volumes at Amsterdam Schiphol airport, Rotterdam and Eindhoven combined grew by 3.9% to 55.3 million. Results published for 2012 show[22]:

- Net revenue increased by 5.8% to €1.35 billion.
- An Operating Result of €296 million (decrease of 2.5% compared to 2011).

[21] AENA Annual Report 2011

[22] Schiphol Group 2012 Annual Results

Heathrow Limited (formerly BAA Limited)

In October 2012 BAA announced a rebrand of its airports. Heathrow, Glasgow, Aberdeen, Southampton are since then operating under their own stand-alone brand. Edinburgh and Stansted were sold respectively to Global Infrastructure Partners (2012) and Manchester Airport Group (February 2013).

Reported below are Heathrow Limited financial results for Heathrow and Stansted airports for the year ended 31 December 2012[23]:

- The company managed to reduce its pre-tax losses by 87.2% to £32.8 million.
- Revenue increased by 8.1% to £2.46 billion.
- Increased revenue per passenger of £28.14 in 2012 versus £26.09 in 2011.

Aéroports de Paris (AdP)

Aéroports de Paris is the owner of all the major airports in the French region of Île-de-France. Its high profile assets include the major Paris airports of Charles de Gaulle, Orly and the general/business aviation facility at Le Bourget. The company has participations in other international airports (ie Jordan, Mexico) and in 2012 it bought 38% of Turkish TAV Havalimanlari Holding AS, which runs a portfolio of airports among which is Istanbul Atatürk. Total passenger traffic at the Parisian airports in 2012 increased by 0.8% to 88.8 million. In 2012 AdP achieved these results[24]:

- Total Revenue increased by 5.6% to €2.64 billion.
- Net income decreased to €341 million (-1.9%) for the full year 2012.
- Revenue per passenger increased to € 29.73 (from €28.77).

Fraport

Fraport AG has significant worldwide airport business interests including Frankfurt am Main, Antalya in Turkey and Lima in Peru. In 2012, passenger numbers for the Group rose by 4.1% year-on-year to 188.2 million, with a 1.9% increase at Frankfurt to 57.5 million. Financial results for 2012 show that[25]:

- Revenue increased by 3% to €2.44bn.
- The group profits amounted to €251.6 million, 0.3% higher compared to the previous year.

Aeroporti di Roma

Aeroporti di Roma is responsible for the two main Rome airports – Fiumicino and Ciampino. In 2012 passenger traffic at the two airports decreased by 2.2% to 41.5 million[26]:

- Revenue decreased by 2.9% to €602.1 million in 2012.

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[23] Heathrow Limited - Results for the year ended 31 December 2012

[24] All Data Aéroports de Paris 2012 Annual Financial Statement

[25] Fraport Annual Report 2012

[26] Aeroporti di Roma 2012 Annual Report

- Net income increased to €263.1 million (was €41.9 in 2011).

Flughafen Wien

Flughafen Wien is responsible for Vienna International Airport in Austria. 2012 passenger numbers were up 5% on 2011 to 22.2 million. Financial Results for 2012 show[27]:

- A 4.4% increase in revenue to €607 million.
- A net profit of €71.9m, 127.5% higher than 2011.

Manchester Airports Group (MAG)

As at the end of 2012, Manchester Airports Group owns and operates Manchester, East Midlands and Bournemouth airports. Humberside airport was sold in 2012 while Stansted Airport was bought in February 2013. Total passenger numbers at MAG Airports grew to 24 million passengers (6.7% growth compared to 2011, excluding Stansted). Financial results for FY2011/12 show:[28]

- 8.6% increase in revenue to £373.2.
- A 26% increase in operating profit to £65.5m.

Zurich Airport

Flughafen Zurich AG operates Zurich Airport, where passenger numbers increased by 1.9% to 24.8 million passengers in 2012. Its financial performance was mixed:[29]

- Revenues rose by 4.8% to CHF 948.8m.
- Profit decreased by 44.2% to CHF 94.7m, however if the one-off effect of IAS 19 is excluded (employee benefit obligations in the context of the new affiliation contract between Flughafen Zurich AG and the Employee Pension Fund of the Canton of Zurich BVK) profits rose by 13.1% to CHF 192m.

Flughafen München

Flughafen München is the owner and operator of Munich International Airport which in 2012 handled 38.4 million passengers (+1.6% compared to 2011). Financial data for the year 2012 shows that revenue increased by 4.6% to €1.19 billion. Consolidated profit grew by 28.27% to €95 million.

Københavns Lufthavne

Københavns Lufthavne owns Copenhagen Kastrup Airport and Roskilde Airport in Denmark. In 2012 the group sold its 49% stake in Newcastle Airport in the UK.

Passenger numbers at Copenhagen Kastrup reached a historic record of 23.7 million in 2012[30] (+2.7% compared to 2011), and its financial performance is summarised below:

[27] Flughafen Wien 2012 Annual Report

[28] Manchester Airports Group Annual report and accounts 2012

[29] Zurich Airport Financial Report 2012

- Total revenue rose by 5.1% to DKK 3.52 billion in the twelve months ended 31 December.
- Net profit grew by 113.6% to 1.62 billion DKK.

Rest of the World

A selection of financial and operational results from airport groups around the world is reported below, to provide a means of comparison with the European airport groups.

Greater Toronto Airports Authority

The Greater Toronto Airport Authority is responsible for Pearson International Airport in Toronto, Canada. In 2012 the airport served 34.9 million passengers and its financial performance highlights are as follows[31]:

- Total revenue increased by 0.1% to CAD 1.14 billion.
- The GTAA recorded a profit of CAD 14.2m.

Airports of Thailand

The Airports of Thailand group includes Bangkok Suvarnabhumi, Bangkok Don Muang, Chiang Mai, Phuket, Hat Yai and Chiang Rai. The six airports accounted for 71.5 million passengers in 2012, an increase of 7.9% on 2011[32]. Financial results for 2012 show:

- Revenue increased by 6.4% to THB 30.5 billion.
- Full year profits rose from THB 2.2 billion to THB 6.5 billion.

GMR

GMR is a major Indian infrastructure group that manages and operates New Delhi International Airport, Hyderabad Airport and Sabiha Gökçen Airport in Istanbul. The group also has a significant interest in the expansion work at Malé Airport in the Maldives. Results for the fiscal year ending 31st March 2012 show a total income for the group's aviation segment of 4.38 billion Indian Rupees (Rs), compared with 3.02 billion of the previous year. In the same period Delhi airport passengers increased by 20%, reaching 35.88 million. Hyderabad increased as well (+12.7%), achieving 8.6 million passengers. Passenger traffic at Istanbul Sabiha Gökçen airport increased by 18% to 13.7 million in the calendar year 2011.

TAV Airports Holding

TAV Airports holding has significant airport interests in Turkey and surrounding countries, including the operation of Istanbul Atatürk, Ankara Esenboga, Monastir, Enfidha and both Skopje and Ohrid Airports in Macedonia and Tblisi and Batumi in Georgia. 72 million passengers travelled through the group's airport in

[30] 'Kobenhavns Lufthavne Annual report 2012

[31] Greater Toronto Airports Group 2012 Annual report

[32] Airports of Thailand 2012 Annual report

2012 (+36% versus FY2011). The shareholding structure has changed in 2012; Aéroports de Paris (ADP) bought 38% of TAV Airports Holding. The financial results for calendar year 2012 show[33]:

- Revenue for the full year 2012 totalled €1.1 billion (+25% vs. 2011).
- Profit for the full year was €124 million, reaching a record high (€53 million in 2011).

4.2.5 Major Airport Developments

Below are reported the major airport developments in Europe, North America, Latin America, Middle East, Asia Pacific and Africa. The information has been obtained from various sources including CAPA, ACI 2012 World Airport Development News, ACI 2012 Economics Report and Air Transport World (September 2013 issue).

European Union

United Kingdom

Manchester Airport Group acquires Stansted airport - Between 2012 and 2013 the Manchester Airport Group (MAG) acquired Stansted Airport from Heathrow Airport Limited (HAL, previously branded BAA). HAL was forced to sell Stansted Airport as per a court ruling. As part of the transaction, Australia-based Industry Funds Management (IFM) has taken a 35.5% equity interest in the enlarged MAG group.

Ferrovial sells Heathrow stakes to Qatari and Chinese funds - Throughout 2012 Ferrovial, the Spanish-based main stakeholder in HAL, has reduced its stakes in Heathrow Airport Limited by selling its stakes to Qatar Holding, a Middle East sovereign wealth fund and to CIC International, an arm of China's leading sovereign wealth fund. Ferrovial's stake in Heathrow has thus fallen from 49% to 33.7%.

London City Airport plans to upgrade its departure gates, lounges and baggage services over the next three years, as well as other infrastructure works to include new stands and parallel taxiway works. This is to facilitate growth of aircraft movements from 70,000 to 120,000 a year, and passenger growth from 3.2 million to a notional 10 million passengers per annum. Key to the airport expansion is the introduction of the 130-seat Bombardier C series aircraft. Presently, the C series will not fit into the current stands, hence the need for an upgrading programme.

London Southend opened ahead of London Olympics – The new GBP 80 million passenger terminal at London Southend was opened in the first quarter of 2012. The terminal is expected to handle 1 million passengers per year.

France

Paris-Orly airport six-year upgrade programme - Aéroports de Paris released details of a six-year upgrade plan for Paris-Orly Airport. The key focuses of this programme are the merger of the two existing

[33] TAV Airports Investor Relations Financial Statements 2012

terminals in a single facility by 2018 and the construction of a new international departure terminal. These upgrades will result in the addition of more than 100,000 m² of new space for passengers.

Lyon-Saint Exupéry airport five-year investment plan – Lyon Airport will invest EUR 260 million in the next five years to upgrade its infrastructure. The main scheme is the extension of Terminals T1 and T3 with the aim of maximising their capacities. By 2020 the airport will be able to accommodate an estimated 10 million passengers with the introduction of 70,000 m² of extra terminal space, two additional widebody aircraft stands at Terminal 1 (for A380); four additional medium-haul aircraft stands at Terminal 3.

Germany

Further delayed opening of Berlin's new airport - The planned opening of Berlin Brandenburg (BER) on 3 June 2012 was further postponed to 2014 because of issues related to the completion and subsequent acceptance testing of certain safety relevant installations, incurring cost overruns totalling around EUR 1.2 billion.

Italy

Italian National Airport Plan – In 2012 it was reported that the Italian Ministry of Economic Development was considering decreasing the number of government-owned airports from 60 to 33, and privatising the remaining 27 airports. ENAC, the Italian Civil Aviation Authority, presented the National Airport Plan with the objective of reorganising the airport system and provide guidelines for strategic development of aviation infrastructure in line with the Ministry's aims.

Portugal

ANA Airports of Portugal sold to Vinci – The 50-years concession of ANA Airports of Portugal was sold to Vinci for around EUR 3.08 billion. The French corporation is one of the largest construction companies in Europe and operates nine regional airports in France and is the concession company for Cambodia's three international airports. Portugal was required to sell part of its state-owned assets after the EUR 78 billion bailout agreement with the European Investment Bank, 17 European Countries and the IMF.

Spain

AENA aims to improve profits at small airports - AENA Airports has been working on an Airport Efficiency Master Plan, which aims to improve the profitability of the 19 airports in its network with less than 500,000 passengers per year. The plan seeks to implement measures such as flexibility, keeping multi-role staff and reducing costs. Due to the economic crisis the demand at these smaller airports has decreased thus forcing AENA to look for approaches to adapt the airport cost structure.

Croatia

New operators and new terminal announced at Zagreb airport - The Zagreb Airport International Company (ZAIC) comprising amongst others, Aéroports de Paris, won the concession for Zagreb airport and announced the construction of a new terminal, as required by the concession contract signed with the Croatian government. The concession contract constitutes a total investment of EUR 324 million (EUR 236 million for the design and construction of the new terminal and EUR 88 million for the life cycle of the airport infrastructure).

Greece

Greek airports restructuring - The Government of Greece revealed in June 2012 that it was seeking to establish public-private partnerships to develop 37 state owned airports in the country, as part of a larger restructuring effort by the Greek Government to privatise state companies and infrastructure.

Hungary

Budapest airport closed temporarily Terminal 1 – The collapse of Hungarian national carrier Malev and additional tax concerns affected Budapest Airport, forcing it to temporarily close Terminal 1 with the objective of reducing operating costs. Airline operations (mainly of low cost carriers: EasyJet, Germanwings, Jet2.com, Norwegian, and Wizz Air) were transferred from Terminal 1 to Terminal 2 in May 2012.

Poland

Two new airports started operations in 2012 – Modlin, a former military aircraft base near Warsaw was modernised at a cost of EUR 70 million with an annual planned capacity of 2 million passengers. The first Polish greenfield airport built since World War II was inaugurated near Lublin. Construction work started in November 2008. 300,000 passengers are planned in the first year of operations.

Rest of Europe

Norway

Oslo expansion plans - Oslo Airport has published its international terminal extension plan for 2020. The airport facilities will be extended by 117,000 m². Phase 1of the expansion project (to be finished in 2017) will create capacity for 28 million passengers, with phase 2 extending this to 35 million (to be finished in 2020). The USD 2.2 billion project will be financed with commercial income, the largest proportion of which is derived from duty-free sales.

Turkey

Istanbul Atatürk Airport near capacity limits: new runway planned – With over 45 million passengers in 2012, Atatürk Airport (IST) is nearing its capacity limits. The State Airports Authority, DHMI, started working on a 2,500 m long fourth runway which can meet the estimated demand for the next ten years, doubling the capacity of the airport. With the new runway (and apron extension), the number of air traffic movements at Atatürk Airport can rise to 70 aircraft per hour.

Third Istanbul Airport –The Turkish Government has started the building process for a third Istanbul airport by nationalising a plot of land for the project. The airport will be able to accommodate 90 million passengers in its first stage and up to 150 million in its final stage. According to the Government, Atatürk Airport's function would change to become an inner-city boutique airport, and with the expected increase in air traffic, both airports would be necessary.

New Airport at Zafer – Zafer Airport was formally opened in November 2012. The construction began in May 2011 and it was completed 18 months ahead of programme. The new airport has a 3,000 metres runway and a 20,000 m^2 terminal capable of accommodating up to 1.5 million passengers per year.

Russia

Four new airports and six airport reconstructions in North Caucasus Resorts - Within the framework of tourism development at North Caucasus resorts, reconstruction of six existing and construction of four new airports is planned in this region of Russia. According to analysts, modernisation of transport and logistics systems is needed due to expected tourist flows, which are forecast to reach up to 40,000 per day. The objective is to build airports in close proximity to the resorts to facilitate tourist arrivals. The airports of Krasnodar (Krasnodar territory), Maykop (Republic of Adygea), Makhachkala (Dagestan), Mineralnye Vody (Stavropol region), Nalchik (Kabardino-Balkaria) and Vladikavkaz (Republic of North Ossetia) will be reconstructed. New airports will be constructed in Zelenchuskaya (Karachaevo-Cherkessia), Mamison (Republic of North Ossetia, near the Georgian border), and Matlase (Republic of Dagestan).

Middle East

Gulf Cooperation Council (GCC)

GCC States plan to spend USD 90 billion on their airports by 2020 - The six Gulf Co-operation Council (GCC) States plan to spend around USD 90 billion on overhauling their airports by 2020 to cope with passenger numbers that have grown annually by 10%. The region is scheduled to see eight new runways and the refurbishment and expansion of a number of airports and military bases, as Gulf States move to consolidate their global travel hub status.

Kuwait

Kuwait will spend USD 6 billion to double passengers number – By the end of 2016, USD 6 billion will be spent by the Government of Kuwait to almost double the number of passengers its Kuwait City international airport is capable of handling. A new terminal will be added and the existing will be upgraded to handle 13 million passengers. The airport capacity may be expanded to 25 million passengers by 2025 and 50 million by 2035.

Bahrain

Bahrain Airport boosts capacity – A ten-year development plan for Bahrain International Airport is being undertaken. The Government has outlined the two-phased scheme: the airport will undergo comprehensive maintenance work during phase 1; then it will be expanded to increase capacity in order to meet the predicted traffic development. In the second phase a brand new airport will be built.

Abu Dhabi

New USD 3 billion Midfield Terminal Complex at Abu Dhabi International Airport - USD 3 billion are invested in the construction of the new Midfield Terminal, which includes a 697,000 m² terminal building as well as the associated airside and landside infrastructure. The terminal is scheduled to open in 2017. Passenger facilities will also include a transit hotel and a heritage and culture museum. It will be able to handle more than 30 million passengers and will have sufficient piers to accommodate 65 aircraft, including the Airbus A380.

Qatar

New Doha International delayed opening - Opening of the New Doha International Airport (NDIA) was delayed and partial passenger operations did not start until the second half of 2013 (the original scheduled opening date was 12 December 2012).

Saudi Arabia

Multi-billion dollar capacity expansion at 27 Saudi airports - The Saudi Government is planning multi-billion dollar projects to expand capacity to cope with air traffic demand at 27 airports, including Riyadh and Jeddah (see below).

Riyadh Airport three-fold expansion - Riyadh's "King Khalid International Airport" is to be expanded within the next five years, to accommodate rapidly rising passenger traffic. Capacity at Riyadh Airport will rise from 12 million to 24 million. The project will include construction of a new terminal, Terminal 5 (expected to be complete by November 2013) and an expansion and upgrade of existing Terminals 3 and 4 (starting in 2013 and to be completed by the end of 2015).

USD 7.2 billion expansion of Jeddah Airport - Saudi Arabia is also planning a USD 7.2 billion expansion of Jeddah's "King Abdulaziz International Airport" (KAIA) to raise its capacity from 17 million to 30 million. The project includes a new terminal, a railway station to accommodate new high-speed trains serving Makkah and Medinah, and associated infrastructures. The new facilities are expected to be operational in 2014. By 2035 the projected annual volume of passengers at KAIA is between 70 and 80 million.

Privatisation and construction of Medinah Airport – In 2012 Saudi Arabia's General Authority of Civil Aviation (GACA) signed a Build-Transfer-Operate contract with a Consortium for the construction and operation of Medinah Airport, under a 25-year concession. It is the first airport privatization of Saudi Arabia. The Consortium will complete the construction of the passenger terminal by the first half of 2015. The capacity of the Airport will be increased to 8 million passengers per year through the growth of the capacity of the existing airport, a new terminal building and new aprons and fast exit roads. At the end of the projects the capacity will be increased to 16 million passengers per year.

Oman

National Committee for Airport Development activities - The Ministry of Transport & Communications has set up a National Committee for Airport Development to speed up the expansion programmes of the two international airports and development of four greenfield regional airports in the country. The Government is investing billions of dollars on expanding the Muscat (see below) and Salalah airports and for building four regional airports at Sohar, Duqm, Ras al-Hadd, and Adam. The four regional airports that will link interior regions with Muscat are being developed to meet the growing travel demand.

North America

United States

San Juan Airport privatisation under the FAA's pilot programme – Under the 2012 revision of the Federal Aviation Administration (FAA) Airport Privatisation Pilot Program, where now up to 10 jurisdictions could apply for permission to lease an airport on a long-term basis and transfer the lease proceeds to the general government budget, San Juan, Puerto Rico's Luis Munoz Marin International Airport was privatised in 2012.

New Tom Bradley International Terminal (TBIT) in Los Angeles - The New Tom Bradley International Terminal (TBIT) in Los Angeles is being completed by the end of 2013. The new Bradley West terminal will double the size of the existing terminal at a cost of USD 1.545 billion. The terminal is the core of a development programme that is funded entirely by LAX operating revenues, capital improvement programme funds, fees from airlines, passenger facilities charges, and airport revenue bond proceeds.

USD 3.6 billion overhaul of New York La Guardia Airport's main terminal announced – The Port Authority of New York & New Jersey announced the programme of an overhaul of La Guardia Airport's main terminal. The project will be operated under a public-private partnership model. A new Central Terminal Building will replace the existing facility, which opened in 1964. Construction is expected to begin in 2014 and may take eight years.

New York JFK USD 175 million Terminal 5 extension – Work is underway on a USD 175 million extension to Terminal 5 at New York JFK International Airport. The project is expected to be completed in early 2015. Two floors totalling 14,400 m^2 will be added to the building.

Canada

Vancouver International Airport (YVR) is improving facilities - Vancouver International Airport (YVR) is investing EUR 1.3 billion to improve the airport, including new baggage and passenger facilities. The upgrade plan includes renovations to the original areas of the 1968 domestic terminal and other airside enhancements. The aim is to cut passenger connection times from 90 minutes to less than an hour.

Latin America

Brazil

Private and public spending on major Brazilian airports – In 2012, the Brazilian Federal Government had raised USD 14.3 billion through the auction of the São Paulo-Guarulhos, Viracopos-Campinas, and Brasília airports to private investors. The winners of the bid will invest a total of USD 9.4 billion on the three airports. Further to this, at the end of 2012 the Federal Government approved the international airport concessions of Rio de Janeiro's Galeão Airport and Belo Horizonte-Confins which total USD 5.52 billion. About USD 13 billion are expected to be invested on the two airports.

Government's Investments on 270 regional airports - About USD 1.17 billion of public money is being invested in the upgrading of Brazilian airports. Work includes refurbishment, upgrading and expansion projects. Most of the work is taking place at airports in or near the twelve host cities for the 2014 World Cup, although smaller airports are also included. The Government has indicated that the intention is for Brazil to achieve a network of 800 regional airports, each within 60 km of any city with at least 100,000 residents.

Chile

Santiago Airport expansion announced – Traffic at Santiago's "Arturo Merino Benitez International Airport" (AMB) increased by 14.8% between 2010 and 2011. The Government announced a new plan that will expand capacity in three stages. Phase 1, currently under way, is scheduled to be completed by 2017. Stage 2 would see investments totalling USD 700 million over a 15-year period by a new concessionaire. Capacity would be increased to serve 29 million passengers by 2030. The third stage would allow the terminal to serve 50 million passengers by 2045. The plan aims to turn AMB into South America's most modern airport. The new concession will include construction of a new terminal to serve international flights, while the existing facilities will be converted into a domestic terminal.

Ecuador

New Quito International Airport completed –The greenfield airport was officially open to air traffic on 20 February 2013, replacing the existing constrained airport.

Asia Pacific

India

High growth projections at Indian Airports – According to Boeing vice-president for Asia-Pacific and India, India will have the highest passenger traffic growth in the world in the next 20 years. Air travel demand in the country is projected to grow from 143 million passengers in 2011 to 452 million in 2020. These growth projections point to an additional requirement of 30 airports over the next five years and 180 in the next decade, according to Indian Planning Commission estimates. The passenger terminal capacity in all airports, expected to be 230-240 million in 2012, is likely to grow to 370 million. Indian airports require an investment of about EUR 8 billion between 2012 and 2017.

International status to tourist-oriented airports – The AAI is going to provide international airport facilities at places with tourism potential. Eight airports will be given international status. Among these are airports are Agra, Bhubaneswar, Coimbatore, Mangalore, Lucknow, and Varanasi. The declaration is expected to provide incentive to domestic and international tourism and contribute to the economic development of the concerned regions.

China

Chinese airport construction boom - In 2012 China's economic planning agency approved 24 projects to build new airports, with plans to build 82 new airports and expand 101 existing ones between 2011 and 2015, with an estimated investment of around USD 15.9 billion. The new airports are mostly feeder airports, planned mainly for the western provinces, including Gansu, Qinghai, Xinjiang, Sichuan, and the north-eastern province of Heilongjiang. Airport expansion will be carried out primarily in Wuhan, Nanning, Chongqing, Harbin, Haikou, and Ningbo. By 2015, China will have 230 airports, up from the current 182. The vision is for around 90% of the Chinese population to be within 100 km of an airport, by 2020.

Preparatory work for Beijing's new international airport has started at Daxing, which will have a notional capacity of 130 million passengers a year. The current Beijing Capital International Airport is nearly at its capacity limits. In its first phase, due in 2018, Daxing's annual capacity will be 80 million passengers, located about 50 km south of the city centre. The new airport is designed to have eight runways and access to a broad ground transport network, including high-speed trains and inter-airport trains.

China – Hong Kong

Third Runway plans at Hong Kong Airport - A third runway, expected to cost six times the HKD 23 billion price tag to build the original Chek Lap Kok airport, which opened in 1998, was approved, in principle, by the Government of Hong Kong. With the Government's approval the Airport Authority has begun the three-phase process of project planning, approval and implementation. The airport is expected to reach its capacity by 2020, with the Airport Authority predicting demand by 2030 to reach 97 million passengers.

Thailand

Second phase development at Bangkok Suvarnabhumi – In 2012, Airports of Thailand Plc (AoT) commissioned EUR 1.48 billion second-phase development of Bangkok's Suvarnabhumi Airport. Upon completion in 2017, the expanded airport will be able to accommodate 15 million more passengers per year for a total of 60 million annually. The airport, which was opened in 2006, handled over 50 million passengers in 2012, although its maximum capacity is only 45 million.

Japan

More international slots at Tokyo Haneda - The airport previously focused on domestic travel and some regional charter flights. With the fourth runway, a supplementary 60,000 annual take-off and landing slots became available. New international services were added in 2012 (17 cities in 12 countries). In 2013 the Japanese Government is expected to increase the international slots at Haneda to 90,000. An expansion project for the international terminal started in 2012 in preparation for the added slots, with completion scheduled for 2013.

Singapore

New Terminal 4 to open in 2017 at Changi airport – Singapore Changi Airport closed its Budget Terminal in 2012. Work began on the new Terminal 4, scheduled to open in 2017. The new terminal will have a capacity of 16 million passengers per year, more than twice the capacity of the current budget terminal, enabling efficient passenger processing and quick turnaround of aircraft but will not have boarding bridges.

Indonesia

Indonesia plans to build and relocate 45 airports in the next decade – Under the framework of the 2030 Airport Master plan, the Indonesian Transport Ministry is preparing to build and relocate a total of 45 airports. In the first phase 24 new airports will be built until 2017, and then the rest will be built gradually up to 2022. Part of the plan is to build a second airport serving Jakarta on reclaimed land in Jakarta Bay.

Expansion of Jakarta Soekarno-Hatta airport - The expansion of Jakarta's Soekarno-Hatta International Airport began in 2012. Once the USD 805.6 million expansion project is complete in 2014, capacity at the airport will have increased from 22 million passengers a year to 62 million.

Africa

Nigeria

Government plans to construct 5 airport terminals and to upgrade 11 airports - The Nigerian Federal Government has a short-term plan to upgrade eleven airports. In the medium term the Government has approved a sum of USD 675 million to start construction of five new airport terminals in Lagos, Abuja, Port Harcourt, Kano, and Enug. The third phase of the Government strategy is to implement the Aerotropolis project, airport cities that provide clusters of businesses ranging from manufacturing, information and communication technology.

4.3 Airport Charges

Although the framework of airport charges is largely uniform and their structures are similar, the levels of charges can vary significantly among similar airports. The tables and charts below detail the major airport charges at a selection of airports in Europe, Africa, Asia Pacific and the Americas for a narrow-bodied Boeing 737-800 and a wide-bodied Boeing 747-400 aircraft.

Table 4.5: Airport Charges (in GBP) at Selected Airports Boeing 737-800 Aircraft

Airport	Airport Charges 2011	Airport Charges 2012	% Chg Airport Charges	Pax Charges 2011	Pax Charges 2012	% Chg Pax Charges	Total Charges 2011	Total Charges 2012	% Chg Total Charges
EUROPE									
Frankfurt	718	740	3%	2,605	2,758	6%	3,322	3,498	5%
London LHR	1,245	1,459	17%	3,308	3,757	14%	4,553	5,216	15%
Paris CDG	561	586	4%	3,509	3,587	2%	4,070	4,173	3%
Madrid	840	860	2%	1,193	2,214	85%	2,033	3,074	51%
Amsterdam	968	983	2%	2,541	2,591	2%	3,509	3,574	2%
Istanbul IST	662	662	0%	1,085	1,085	0%	1,747	1,747	0%
Moscow DME	868	887	2%	1,537	1571	2%	2,405	2458	2%
AFRICA									
Johannesburg	893	936	5%	1,778	1,896	7%	2,671	2,833	6%
Casablanca	324	580	79%	1,214	1,540	27%	1,538	2,120	38%
Nairobi	442	442	0%	1,394	3,485	150%	1,836	3,927	114%
ASIA PACIFIC									
Dubai	272	272	0%	1,422	1,517	7%	1,695	1,790	6%
Hong Kong	533	533	0%	497	497	0%	1,030	1,030	0%
Beijing	377	377	0%	926	926	0%	1,302	1,302	0%
Tokyo NRT	1,639	1,639	0%	1,804	1,804	0%	3,442	3,442	0%
Sydney	339	355	5%	3,163	3,214	2%	3,502	3,569	2%
AMERICAS									
Chicago ORD	917	780	-15%	2,573	2,541	-1%	3,490	3,321	-5%
New York JFK	626	677	8%	313	313	0%	939	991	6%
Rio de Janeiro GIG	445	571	28%	1,954	2,071	6%	2,399	2,643	10%

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)

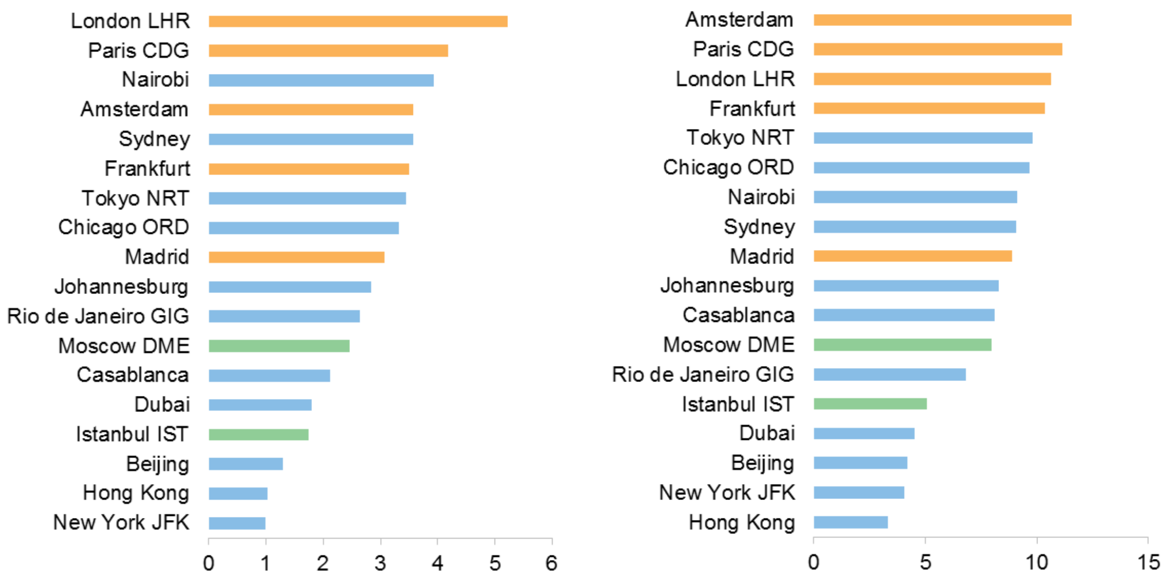
Table 4.6: Airport Charges (in GBP) at Selected Airports for Boeing 747-400 Aircraft

Airport	Airport Charges 2011	Airport Charges 2012	% Chg Airport Charges	Pax Charges 2011	Pax Charges 2012	% Chg Pax Charges	Total Charges 2011	Total Charges 2012	% Chg Total Charges
EUROPE									
Frankfurt	3,992	4,064	2%	5,934	6,283	6%	9,925	10,347	4%
London LHR	1,893	2,078	10%	7,535	8,558	14%	9,428	10,636	13%
Paris CDG	2,998	2,959	-1%	7,993	8,170	2%	10,991	11,129	1%
Madrid	3,755	3,844	2%	2,718	5,043	85%	6,474	8,887	37%
Amsterdam	5,558	5,668	2%	5,788	5,902	2%	11,347	11,570	2%
Istanbul IST	2,584	2,584	0%	2,472	2,472	0%	5,056	5,056	0%
Moscow DME	4,306	4,402	2%	3,501	3,579	2%	7,807	7,981	2%
AFRICA									
Johannesburg	3,760	3,973	6%	4,049	4,320	7%	7,810	8,293	6%
Casablanca	2,851	4,615	62%	2,765	3,508	27%	5,616	8,123	45%
Nairobi	1,194	1,194	0%	3,176	7,938	150%	4,370	9,132	109%
ASIA PACIFIC									
Dubai	1,080	1,080	0%	3,240	3,456	7%	4,319	4,536	5%
Hong Kong	2,174	2,174	0%	1,132	1,132	0%	3,306	3,306	0%
Beijing	2,074	2,074	0%	2,108	2,108	0%	4,182	4,182	0%
Tokyo NRT	5,701	5,701	0%	4,108	4,108	0%	9,809	9,809	0%
Sydney	1,682	1,762	5%	7,205	7,321	2%	8,887	9,083	2%
AMERICAS									
Chicago ORD	4,551	3,872	-15%	5,860	5,788	-1%	10,411	9,660	-7%
New York JFK	3,107	3,361	8%	713	713	0%	3,820	4,075	7%
Rio de Janeiro GIG	1,921	2,113	10%	4,450	4,718	6%	6,371	6,831	7%

Source: RDC Aviation/airportcharges.com (Parameters: Currency – GBP; Aircraft – British Airways B747-400; international route; turnaround time – 60 mins; MTOW – 369.9 tonnes; MLW – 285.8 tonnes; capacity – 351 passengers; load factor – 70%; passengers – 246)

The tables above demonstrate the key changes in airport charges at a number of major world airports in 2012 compared with the charges for 2011. Assuming that a change of +/- 5% can invariably be accounted for by fluctuations in exchange rates and inflationary rises, the general trend being shown is that the listed airports have kept total charging at 2011 levels. Exceptions are London Heathrow, Madrid, Casablanca and Nairobi, which have all shown double digit increases (triple digit in Nairobi case) in their charges for 2012.

Figure 4.6: 2012 Total Airport Charges (in thousands GBP) at Selected Airports for Boeing 737-800 (left) Boeing 747-400 (right) Aircraft



Source: RDC Aviation/airportcharges.com (orange: European Union airports, Green: other European airports, Blue: World airports)

As shown in Figure 4.6 there are wide variations in airport charging regimes. For instance, the most expensive airport for a Boeing 737-800 to land (London Heathrow) is about 5 times more expensive than the cheapest (New York JFK). A similar story is in evidence for the Boeing 747-400 with Amsterdam almost 4 times more expensive than Hong Kong. As a benchmark, the major European Union's airports tend to show charges at the higher end of the world spectrum, while airports such as Istanbul Atatürk and Moscow Domodedovo are positioned in the mid-lower price range.

5. Aircraft Manufacturing & MRO

5.1 Introduction

The purpose of this chapter is to provide an overview of the civil aeronautics and aircraft maintenance industries in 2012. Aerospace and civil aeronautic manufacturing activities in the EU represent the second largest global market after the United States and boasts high levels of productivity, innovation and technological development and research.

The chapter contains four main areas of focus intended to explore the activities, trends and issues in this sector of the industry:

- The manufacture of aircraft and civil aeronautic products, including key metrics on output, employment, productivity and import/export activity;
- An overview of important global aeronautic markets and their development;
- The composition of the current global aircraft fleet;
- The Maintenance, Repair and Overhaul (MRO) industry, including its key metrics and trends.

Due to the inconsistent nature of up-to-date figures reported for this industry sector, the most recently published data available in the public domain is used – in some cases this means that the reference year is 2011 for some analyses.

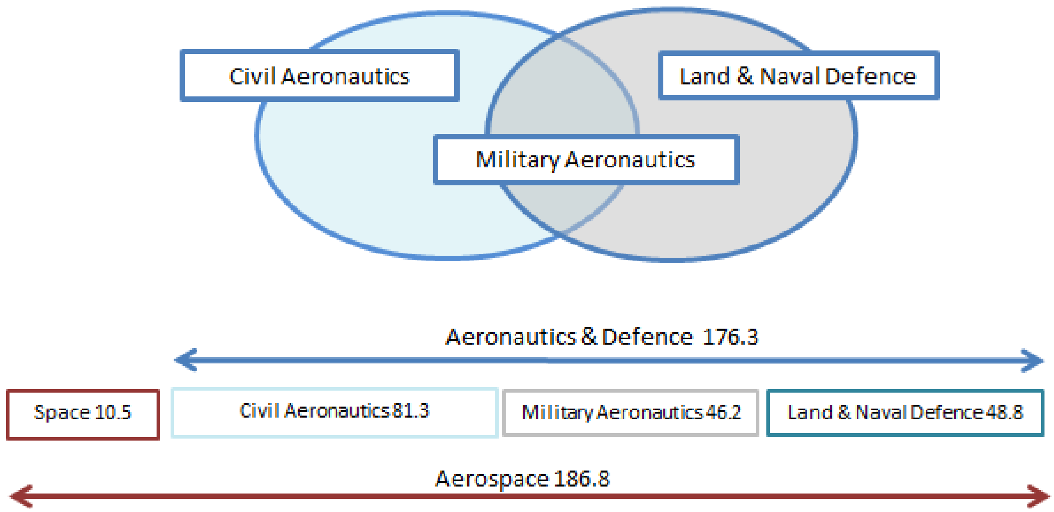
5.2 Aeronautics and Manufacturing Overview

The European aeronautics industry is responsible for the design, development and production of a broad range of aviation products including civil and military aircraft, aero engines, helicopters, unmanned aerial vehicles and their associated systems, parts and equipment. It also includes activities associated with MRO. Additional activities such as the space and defence sectors are specifically excluded from the term ‘aeronautics’, but when all of these activities are considered together they are encompassed in the term ‘aerospace’.

The focus of this chapter is on civil aeronautics, which excludes activities relating to space and those sectors relating to land and naval defence equipment. Due to the high interdependencies of civil and military aviation, the two are considered alongside each other where there can be no differentiation in data sources or where the relevance is important for comparative purposes.

In some cases space activities are included in the analysis where it is standard for major comparable markets (such as the U.S.) to include these figures in their aeronautical data reporting. Where this occurs the term aerospace is used. Figure 5.1 provides a visual description of the relationships between these sectors and the applied terminology.

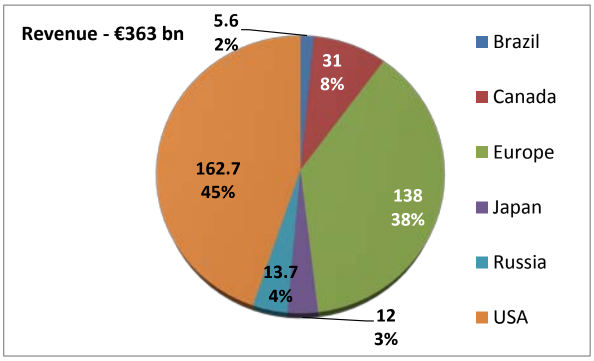
Figure 5.1: Inter-relationship between Space, Aeronautics & Defence Sectors (€ billion)



Source: ASD

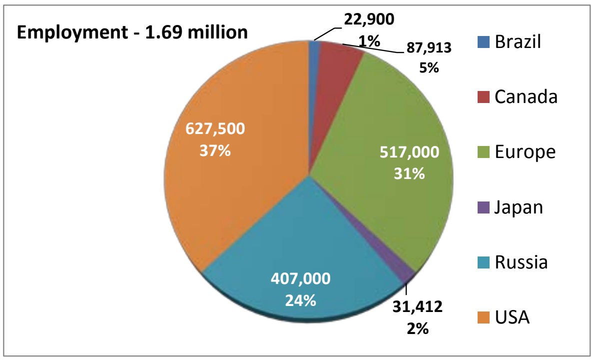
According to figures from the AeroSpace and Defence Industries Association of Europe (ASD), aerospace turnover in the EU totalled €186.8 billion in 2012 (up 9% on the €171.5 billion spent in 2011). 498,200 people were directly employed in aerospace[34]. Comparisons to major international markets are shown below.

Figure 5.2: Comparative Aerospace Turnover (€ bn) 2012



Source: ASD (unconsolidated turnover for Europe)

Figure 5.3: Comparative Aerospace Employment 2012



Source: ASD

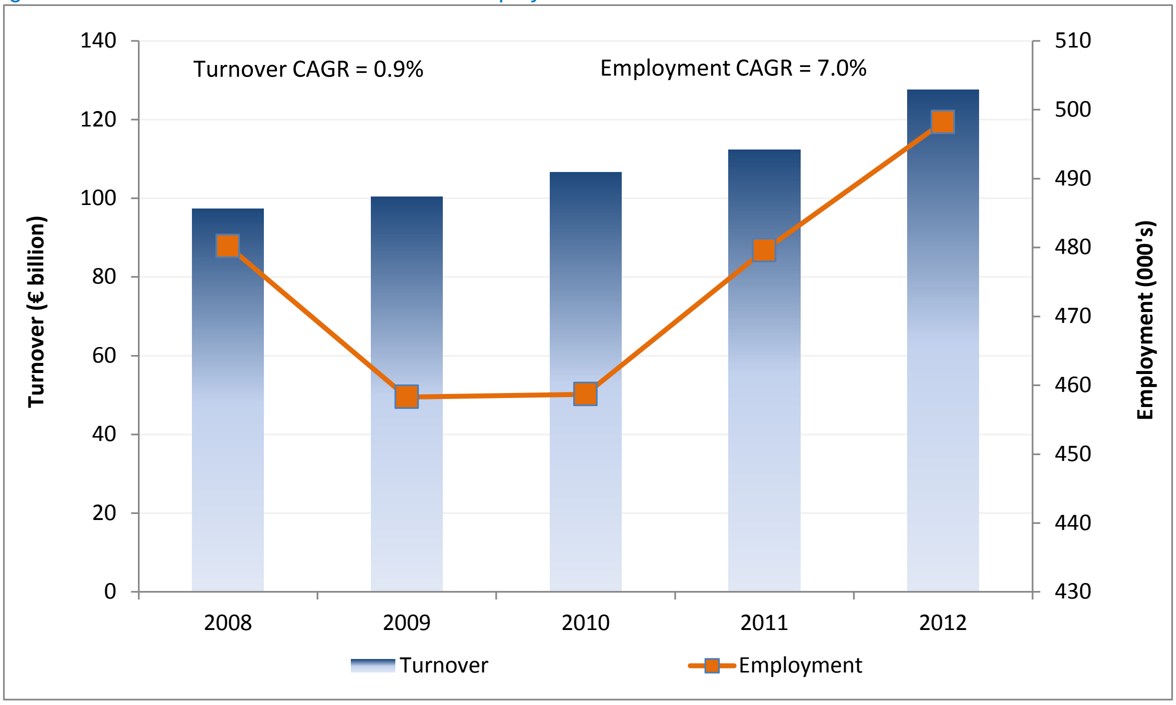
The turnover of the European aeronautic sector in 2012 (civil and military aeronautics but excluding space activities, land and naval defence) totalled €128 billion, an increase of 14% over 2011. This represents a 0.9% CAGR in turnover since 2008[35] (see Figure 5.4).

[34] AeroSpace and Defence Industries Association of Europe, Key Facts & Figures 2012, October 2013.
[35] AeroSpace and Defence Industries Association of Europe, Key Facts & Figures 2012, October 2013.

The number of persons employed in aeronautics reached 498,000, an increase of 8.6% over 2011. This represents a CAGR of 7.0% since 2008. Civil Aeronautics had the largest employment increase of any aerospace sector, mainly due to the activities of Airbus and Safran, despite the effect that austerity policies are having in major aerospace employment sectors, such as France and Spain.

Since 1980, the turnover per employee in the European aeronautical sector has steadily increased, recording an overall long-term growth of 3% per year. In 2012, a new peak of €256,924 per employee was achieved. This followed an increase in 2011 compared with the previous year. Between 1991 (€143,000 per employee) and 2012 (€256,924 per employee) average turnover per employee has increased by 80%.

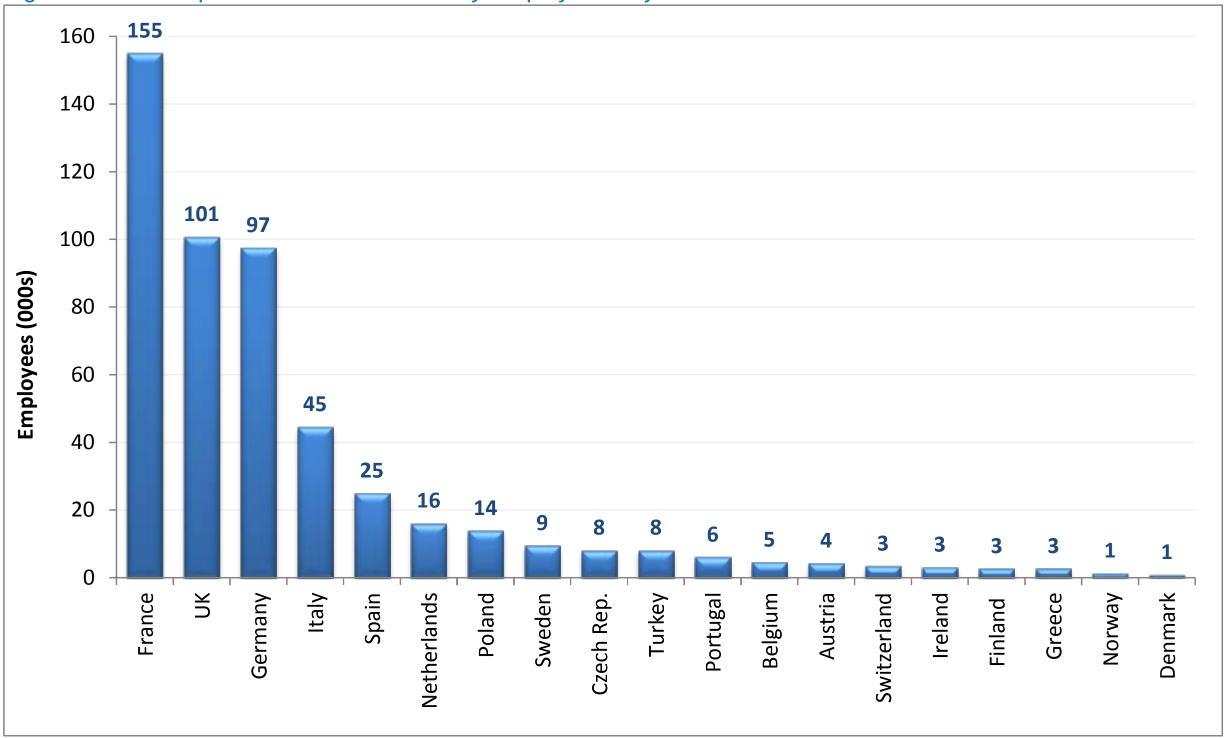
Figure 5.4: EU Aeronautical Turnover and Employment 2008-2012



Source: ASD

In 2011, the top five employers of aeronautical workers in Europe are France, the United Kingdom, Germany, Italy and Spain. Between them they account for 83.5% of aeronautical employment (see Figure 5.5).

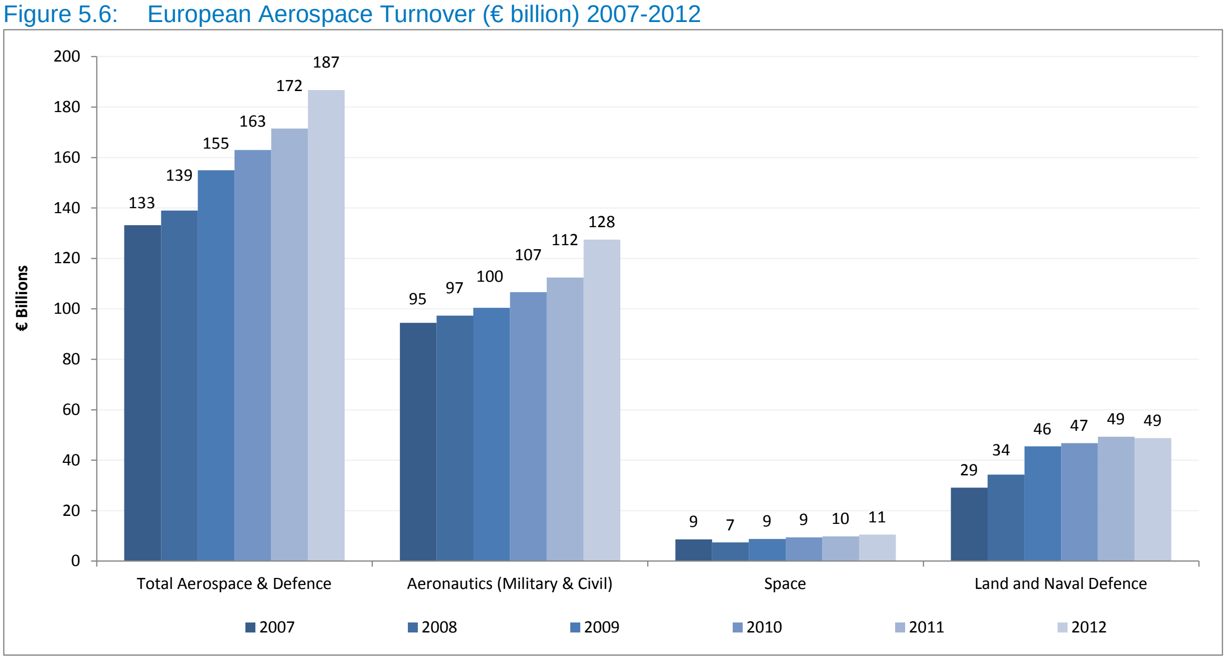
Figure 5.5: European Aeronautical Industry Employment by EU Member State 2011



Source: ASD

In 2012, civil aeronautics represented 68% of the European aerospace and defence industry, by far the most important sector (Figure 5.6).

Figure 5.6: European Aerospace Turnover (€ billion) 2007-2012



Source: ASD

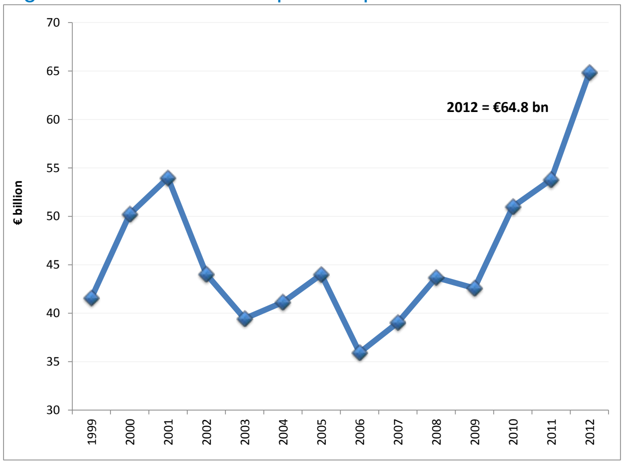
5.2.1 Aerospace Imports & Exports

The European Aerospace Sector as a Whole

Despite the challenges that remain in the industry since the downturn in 2008, European aerospace and defence companies performed well in 2012. The upward trend continued in the face of government spending cutbacks putting pressure on defence budgets, the continued vulnerability of the civil air transport industry to global events and economic trends, cautious consumer spending and the weak US dollar.

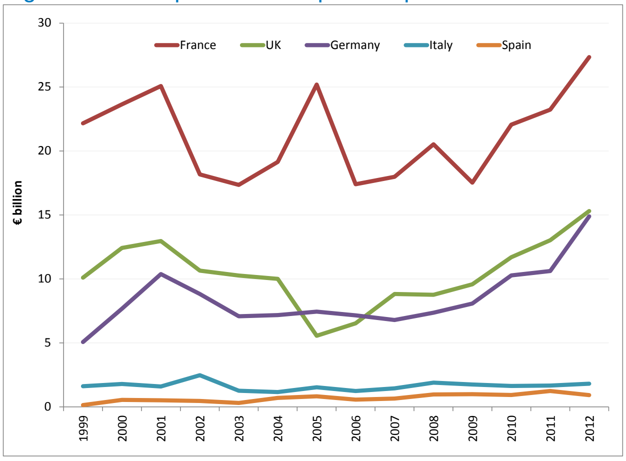
Europe is a net exporter of aerospace and aviation products[36]. In 2012, aerospace exports to the world from EU27 countries totalled €64.8 billion. This represents a significant increase of 20.4% on the previous year and a CAGR of 3.5% since 1999, although there have been cyclical peaks and troughs over the period (see Figure 5.7). In 2011, the United Kingdom (11.3%) France (5.3%) and Germany (3.4%) all recorded increases in exports compared with the previous year (Figure 5.8).

Figure 5.7: EU27 Aerospace Exports 1999-2012



Source: Eurostat

Figure 5.8: Top 5 EU Aerospace Exporters 1999-2011

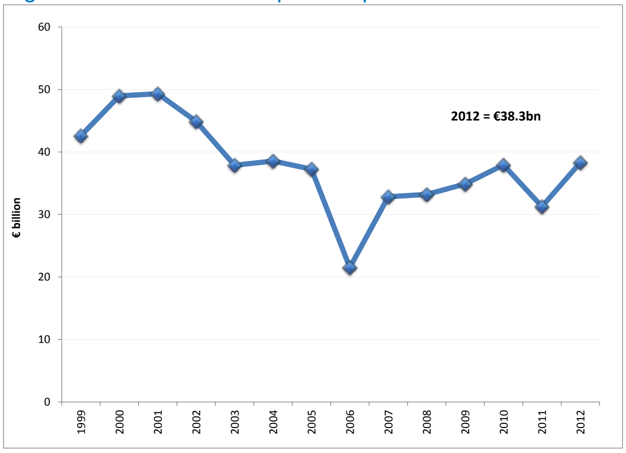


Source: Eurostat

In 2012 aerospace imports to the EU27 countries totalled €38.3 billion which represents an increase of 22.5% versus 2011 and a return to growth after the drop in imports seen in 2011 versus 2010. Despite the return to growth, CAGR since 1999 remains negative at -0.8% (see Figure 5.9). With reference to the Top Five aerospace importers in the EU27 (Figure 5.10), the UK (the greatest importer by a distance) recorded a 27% increase in imports in 2012, partially reversing the 40% drop seen in the previous year, whilst Germany and Spain also recorded big rises in spending, at 14% and 17.6% respectively. Italy saw imports decline by 15.5%.

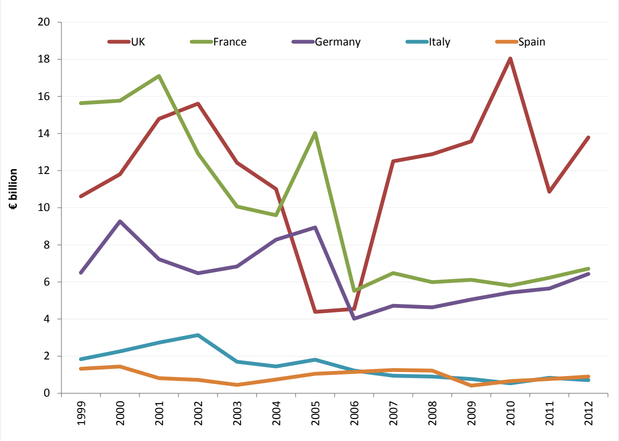
[36] All aerospace import and export data in Figure 5.7Figure 5.12 to Figure 5.12 relates to subgroups of Eurostat SITC codes 714, 792 and 874, which are applicable to aerospace activity.

Figure 5.9: EU27 Aerospace Imports 1999-2012



Source: Eurostat

Figure 5.10: Top 5 EU Aerospace Importers 1999-2012



Source: Eurostat

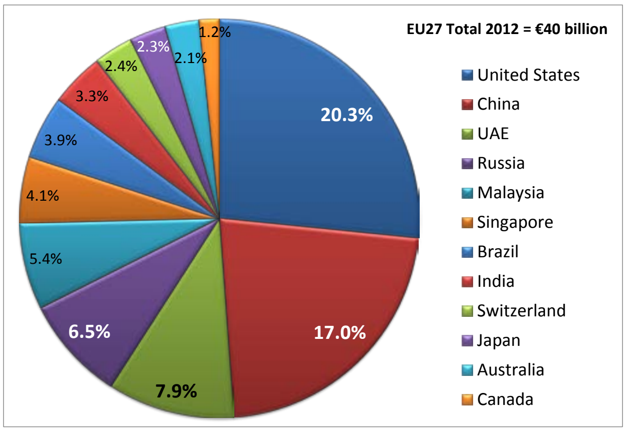
Aircraft (Civil & Military) Exports

In 2012 aircraft[37] exports to the world from EU27 countries totalled just over €40 billion. This figure was a 10% decrease on 2011. Despite this, CAGR for the period beginning 1999 remained positive at 2%, mainly reflecting the strong industry performances in both 2010 and 2011. The primary trading partner for aircraft exports is the United States. Despite the importance of the US, its market share has decreased over time, down from 37% in 1999, to 25% in 2005 arriving at 20% in 2012. The US is followed by China (17%), the UAE (8%) and Russia (7%) (see Figure 5.11).

Figure 5.12 demonstrates that China is fast converging on the US's crown as the EU27's dominant aircraft export market. China and the UAE are the most important growth markets for the EU27, mainly due to the huge fleet growth opportunities in both markets, which have shown robust CAGR growth since 1999 (16% and 14% respectively). Malaysia has demonstrated the highest CAGR over the last decade, at 35%, followed by Russia at 23%. Other emerging markets include Brazil, with a CAGR of 4% and India at 14%.

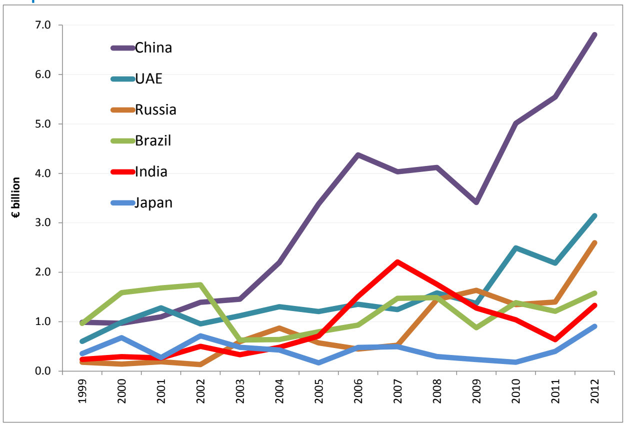
[37] Data refers to Eurostat SITC code 792, which encompasses aircraft & associated equipment, spacecraft (including satellites) & spacecraft launch vehicles and parts thereof.

Figure 5.11: EU Aircraft Export Partners Market Share 2012



Source: Eurostat (SITC 792 only)

Figure 5.12: Evolution of Export Values to Selected EU Export Partners 1999-2012



Source: Eurostat (SITC 792 only)

5.2.2 Global Aerospace Markets

United States of America

The United States has the single largest aerospace industry in the world; with provisional total industry sales in 2012 worth USD 217.9 billion, which were in line with the 2011 sales total. Civil and military aircraft account for 55% of this figure. The industry employed 629,400 workers in 2012 (versus 624,800 in 2011) of which 425,300 (68%) work in the aeronautics sector. The total numbers of employees in the aeronautics sector in 2012 increased by approximately 12,700 compared with the previous year.

Provisional total US Aerospace exports in 2012 totalled USD 118.3 billion[38], of which an estimated USD 84.2 billion relates to civil equipment[39]. The European Union is the largest regional export market for the United States aerospace industry. Combined U.S. aerospace exports to France, the United Kingdom and Germany in 2012 totalled USD 22.2 billion and accounted for 18.8% of the total. China has overtaken France as the largest single country export market receiving 7.7% of U.S. aerospace exports in 2012 worth USD 9.2 billion, marginally ahead of Japan with USD 9 billion (7.6% of total exports). The United Arab Emirates has replaced Germany in the top five country export markets with 6.2% of market share, helped by a ramp up in Boeing 777 demand from the country's leading airlines.

Canada

Canada's aerospace industry has remained stable with no substantial changes to overall revenue, global market share, and growth figures, since 2005. In 2012, its turnover was €22.8 billion and it is the next largest aerospace market after the U.S. and Europe. Canada exported 73% of its aerospace output in

[38] US Aerospace Industry Statistics, US Department of Commerce, June 2013

[39] US Exports of Aerospace Products, Aerospace Industries Association, December 2012

2012. The industry employs over 87,000 workers and an estimated 80% of its aerospace output in 2012 was for the civil aeronautic sector.

A dominant 54% of Canada's aerospace export revenue comes from neighbour the United States. This figure has been gradually decreasing over the past few years as demand for Canadian-built corporate and small regional jet aircraft continues to fall. Europe is the next most important market at just under 26%[40]. European-bound exports have seen a CAGR rise of 15% since 2007. Asia accounted for 12% of exports in 2012.

Bombardier dominates aircraft production in Canada and produces a range of aircraft for the sub-100 seat regional market. Through various acquisitions and mergers including de Havilland, Canadair and LearJet Corporation, the company produces a number of aircraft types for business aviation operations but its main focus is on the regional jet and turbo-prop market. The LearJet, Global, Dash 8 and CRJ series of aircraft have established Bombardier as one of the world leaders in business and regional aircraft. Bombardier is currently engaged in developing the narrow-bodied, twin-engine C-Series aircraft programme. The aircraft, scheduled to enter service in 2013, will offer between 100-149 seats and will be the first aircraft to be powered by Pratt & Whitney's PW1000G engine. As of the end of 2012, firm orders for the C-Series sat at 138 aircraft[41].

Japan

Japan's aerospace industry saw total sales of USD 12.9 billion in 2011 and employed 32,003 workers[42]. The country's aerospace turnover is relatively small in size when compared to the country's main manufacturing industries – automobiles, domestic electronics and computers. Japanese companies supply integral structural components to Boeing for the Boeing 787 programme (main wing assembly, forward fuselage and centre wing box), amounting to 35% of the aircraft build. Japan has a long history of supplying Boeing; the first international joint project was on the Boeing 767 programme, where it is now a 15% program partner and from 1991 it also contributed to the Boeing 777 programme, where it is a 21% program partner.

Japanese industries also contributed to all current and past Airbus aircraft types as subcontractors and/or suppliers, with a number of Japanese companies currently contributing to A380 production. With almost 40% of its output concentrated in civil aeronautics, overall production is linked to demand in North American and European markets and the corresponding manufacturing activity of Boeing and Airbus. This demand is set to increase in line with 777 and 787 production ramp-ups. The latter has overcome the latest in a line of costly production delays and over 65 aircraft are in service as of June 2013. Japan also has a strategic role as a supplier to the Bombardier CRJ and Embraer E170/190 aircraft families.

Japanese manufacturers are also heavily involved in many major aircraft engine families, most notably the International Aero Engines V2500-A5, whereby Japanese Aero Engines Corporation has a stake of 25.25% in the consortium. Japanese heavy engineering firms are also involved in producing components for the GE GEnx and Rolls-Royce Trent 1000, as fitted to the Boeing 787.

[40] Aerospace Industries Association of Canada

[41] Bloomberg News, November 2012

[42] The Society of Japanese Aerospace Companies

In 2011, Japanese aerospace exports totalled ¥416 billion, up 12.4% on the previous year[43]. Imports amounted to ¥579 billion down 16% on the previous year. The industry generated a trade deficit of ¥163 billion. 72% of exports went to the USA, whilst 17% went to European customers. Import activity was also dominated by the United States, at over 77% of total imports. European imports remain significant at 16% of the global total. Japan has a trade deficit of approximately ¥20.6 billion with Europe.

Mitsubishi Aircraft Corporation is currently developing the next-generation MRJ (Mitsubishi Regional Jet), a 70 to 90 seat regional jet, due for delivery in 2015. Sales of the aircraft were originally sluggish, however the programme has secured 150 of its 165 firm orders from US-based firms, in contrast to rival Russian and Chinese aircraft offerings.

Brazil

Brazil is the next largest global aerospace market after the countries discussed above (USD6.8 billion in 2011); and the largest in the southern hemisphere, employing 22,900 workers in 2011. Over 75% of turnover is through exports and aeronautics comprises approximately 87% of the segment split.

Aircraft manufacturer Embraer is responsible for most of the aerospace production in Brazil; as such the entire industry is affected by its performance. Embraer employed around 18,200 people at the end of 2011, representing around 79% of total aerospace employment in the country[44]. Despite a challenging market in terms of financing for new deliveries and reduced demand for its small regional jets and corporate aircraft, Embraer remains well placed in the market. It booked 42 orders for its E-Jet family in 2012 contributing to total orders of 1,093 aircraft for the program and a backlog of 185, ahead of the launch of the enhanced E-Jet E2 variant in 2013[45].

In overall terms the Brazilian aerospace industry is small compared to the major global players (the U.S., EU and Canada), but in terms of growth it experienced high performance; almost tripling between 2003 and 2008. However, in recent years, annual turnover has declined to around USD 6.8 billion in each year 2009 to 2011. Employment has also reduced from a peak of 27,100 people in 2008 to 22,900 in 2011.

Russia

Current Russian aircraft development and production programmes include the Sukhoi Superjet (SJ) 100, a regional jet in the 78-98 seat range, designed to compete against manufacturer's including Bombardier and Embraer. The aircraft was delivered to its first launch customer, Armenian carrier Armavia Airlines, in April 2011. Production of the SJ100 features substantial international partnerships, including Alenia Aeronautics which owns a 25% stake. This agreement makes the Sukhoi SJ100 Programme the most relevant aviation partnership that has occurred between Russia and Europe.

The aircraft has had a number of design and production problems, most notably a fatal crash in May 2012 during a demonstration flight in Indonesia. The entire operational fleet had previously been grounded due to a landing gear issue. As of June 2013, 16 aircraft have entered service across six operators with a

[43] Japanese Aerospace Industry – Paris Air Show 2013, Society of Japanese Aerospace Companies, June 2013
[44] Global Presence - Embraer by Numbers, Embraer, March 2013
[45] Embraer Q4 and Fiscal year 2012 Results, Embraer, December 2012.

backlog of 218. Notable orders from outside Russian and surrounding regions include Orient Thai Airlines (12 aircraft), Willis Lease Finance (six aircraft) and Indonesia's Sky Aviation with 12 aircraft.

Additionally UAC is developing the Irkut MS-21, a twin-engine, single aisle, medium range passenger aircraft which is intended to compete directly with existing narrow-body types – primarily the Boeing 737 and Airbus A320 families - from 2016. This aircraft is also being developed with substantial international involvement, with a number of U.S. suppliers providing components, most notably Pratt & Whitney's PW1400 engine. As of mid-2013, Irkut report that they have booked 241 firm orders for the aircraft and, including options, memoranda of understanding and conditional orders, a total order book for 280 aircraft.

Ukraine

Ukraine is home to the aircraft manufacturer, Antonov State Company (formerly the Antonov Design Bureau). The principle aircraft under production by Antonov at present is the AN-148.

Twenty examples of the AN-148, a sub-100 seat regional jet (and its stretched derivative, the AN-158) have been delivered. The majority of orders have been for Russian whilst an unknown Indian entity has ordered 19 models. Recent orders include a sale of 15 aircraft to the Russian Ministry of Defence. A further 15 aircraft are also destined for operation in Latin and South America and will be delivered in 2013 and 2014[46]

In June of 2013, Antonov announced it was marketing the AN-148-300MP, a maritime patrol version of the aircraft with the capacity to carry armaments. Antonov is also developing a further stretch, dubbed the AN-178, which will be equipped with a ramp and capable of a 16-ton payload[47].

China

Through partnerships with established Western manufacturers and growing domestic commercial aircraft investment, China is slowly emerging as an aircraft manufacturing force.

COMAC, the Commercial Aircraft Corporation of China, was established in 1998 by a number of Chinese Manufacturing and Financing Agencies, to develop and build large commercial aircraft and reduce the dominance of Boeing and Airbus aircraft across Chinese aircraft sales.

COMAC has developed a regional jet, the COMAC ARJ-21, to rival the Embraer E-Jet and large Bombardier regional jets as well as other new sub-100 seat aircraft programs. The aircraft was meant to enter service in 2010 but delays to the flight testing and certification programme mean this is now likely to happen in 2014[48]. It is similar in size and appearance to the U.S-built McDonnell Douglas DC9. COMAC[49] hopes to sell 500 of the regional jets in 20 years and is interested in FAA certification to facilitate exports.

COMAC has booked an impressive 380 orders for its C919 model, aimed at the Boeing and Airbus dominated 150-180 seat market. 2012 saw COMAC book 115 orders for the C919.

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[46] News Archive, Antonov Company, July 2012.

[47] AIN Defence Perspective, Aviation International News, June 2013

[48] Aircraft & Engines News, Air Transport World, November 2012

[49] COMAC - Commercial Aircraft Corporation of China Ltd

Whilst recent aircraft sales to China have shown how important the region is to the major commercial aerospace manufacturers, the country has also benefited from subcontracted manufacturing for aircraft parts as the big aircraft, engine and component manufacturers continue to diversify their supply chains to avail of lower costs. According to data published in 2011, Boeing had purchased more than USD 1.5 billion of aviation hardware and services from China since the late 1980s[50]. Table 5.1 below outlines the principal manufacturing and production provided to Boeing and Airbus by Chinese aerospace entities as of 2011.

Table 5.1: Airbus and Boeing Major China-based Manufacturing Activities 2011

Airbus / Boeing	Provider
A320 Final Assembly	Airbus Tianjin
A320 Rear Passenger Doors, Spoilers	Chengdu Commercial Aircraft, Sichuan
A320 Flight Control Surfaces	Guizhou Aviation Industry Group: HAIG, Harbin; Shenyang Aircraft Industrial Corp.
A320 Rear Passenger Door & Nose Section	Chengdu Aircraft Corporation
A330/340 Large Cargo Doors	Shenyang Aircraft Corporation
A330/340 Wing Spars	HAIG, Harbin
A350 XWB Flight Control Surfaces	Chengdu Commercial Aircraft, Sichuan; Hafei Airbus Composite Center
737 Composite Materials (Internal and External)	Boeing Tianjin Composites Co.
737 Doors	Chengdu Commercial Aircraft, Sichuan
737 Horizontal Stabilizers	Shanghai Aviation Manufacturing
737 Doors	Chengdu Commercial Aircraft, Sichuan
737 Vertical Fin	Xi'an Aircraft Industrial Co.
747 Titanium Forgings	Hong Yuan (HYFC), Sanyuan: Southwest Aluminium, Chongquin
747 BCF Various	Taikoo Aircraft Engineering Co., Xiamen
767 Freighter Conversion Various	Shaanxi Aircraft Industry Co., Hanzhong, Shaanxi
777 Wing and Flight Deck Various	Boeing Tianjin Composites Co.
787 Trailing Edge Various	Boeing Tianjin Composites Co.
787 Composite Rudder	Chengdu Commercial Aircraft, Sichuan
787 Wing Various	Haig, Harbin
787 Vertical Fin Leading Edge	Shenyang Aircraft Corporation

Source: Airbus/RAND

Whilst the Airbus and Boeing manufacturing presence in China has become well-defined, Bombardier and COMAC have entered into an agreement whereby they plan to develop a long–term alliance to develop new aircraft aimed at larger seat segments. It is unclear as to how the relationship will function between the two competitors given that Bombardier is offering direct rivals to both COMAC aircraft programs. Initially, the collaboration is to focus on C-Series test flight support, technical training and sales and marketing functions. Embraer has also entered a joint venture with COMAC-parent AVIC (Aviation Industry Corporation of China) to build Executive Jets.

Whilst Boeing and Airbus clearly share the Chinese airline order books for wide body aircraft (and are set to do so for years to come), there is potential for Chinese-built aircraft to take a share of the regional and narrow body aircraft market. This effect may be influenced by the Chinese government offering incentives

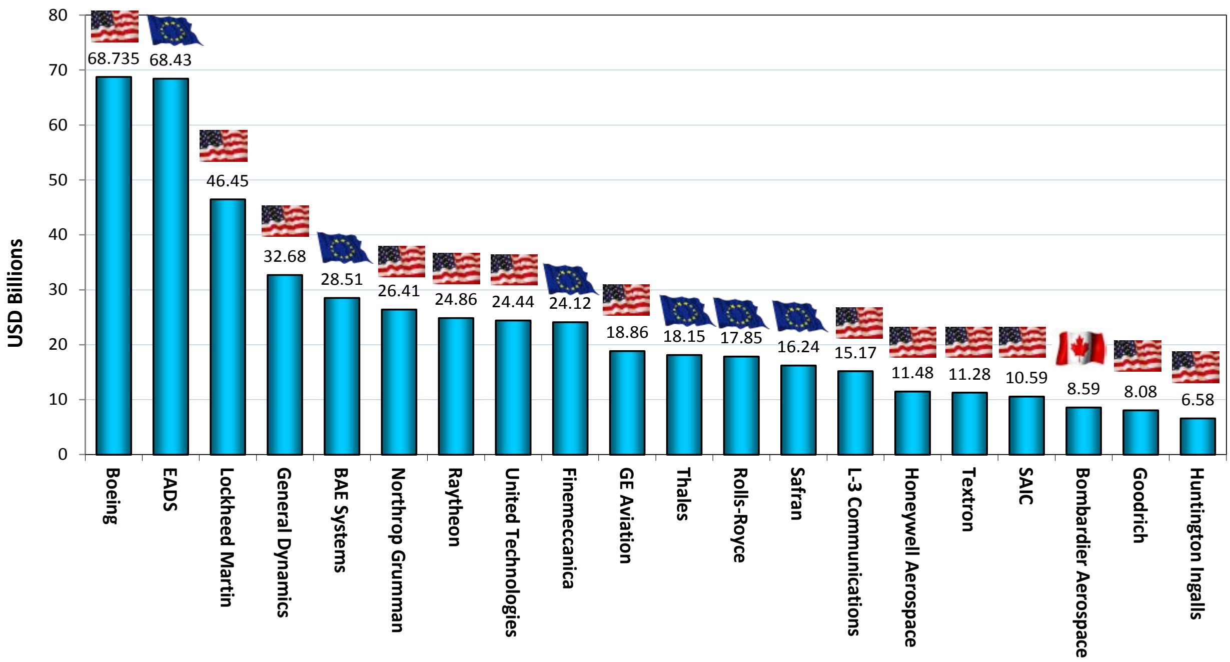
[50] China's Advancing Aerospace Industry, RAND Corporation - 2011

to domestic airlines to buy indigenous aircraft. Western engine OEMs will still benefit as they still dominate engine choices for the new aircraft types.

5.2.3 Aerospace Companies

Europe and the United States dominate the world's leading aerospace companies by revenue. Canada's Bombardier is the only non-US or EU entity in the leading 20 companies in 2011. The total revenue of the top 20 aerospace companies is USD 487 billion. EU-headquartered firms contributed USD 173.3 billion of this revenue (35.5%). Boeing is just marginally ahead of Europe's EADS in terms of revenue (Figure 5.13). As was the case in 2010, EADS and BAE Systems were respectively the second and fifth largest aerospace companies in the world in 2011.

Figure 5.13: Global Aerospace Companies Revenue Performance 2011 (USD Billions)



Source: Deloitte

Overall revenue in the EU grew just 0.8% in 2011, reflecting reduced defence spending and cautious ordering activity in the major civil aviation markets. In the United States, revenue increased by 3.3%, mainly as result of increase demand from emerging economies[51].

Table 5.2: Major European Aerospace Companies Ranking 2011

Company	Turnover ($m)	Country	Company	Turnover ($m)	Country
EADS	68.427		Rheinmetall	2,977	
BAE Systems	28,510		Avio	2,678	

[51] Global Aerospace and Defence Industry Performance Wrap-up, Deloittes, July 2012

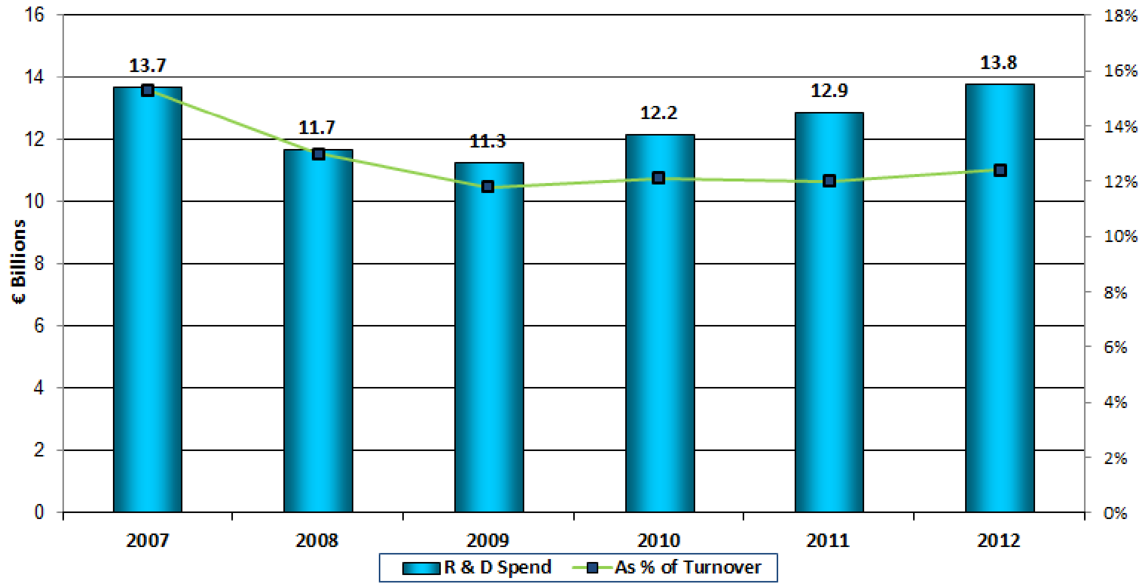
Finmeccanica	24.121		Cobham	2,619	
Thales	18.146		Babcock international	2,442	
Rolls Royce	17.847		GKN	2,374	
Safran	16.236		Qinetiq	2,345	
Dassault Aviation	4,681		Navantia	2,174	
Air France KLM E&M	4,383		BBA Aviation	2,137	
Saab	3,619		Meggit	2,006	
DCNS	3,616		ThyssenKrupp	2.077	

Source: ASD

5.2.4 Research & Development

The European aeronautics industry continues to contribute a large share of its activity to research and development (R&D). The EU 2020 Strategy set a target of 3% of GDP[52] to be dedicated to R&D and innovation. In 2012, R&D expenditure in the European aeronautics sector equated to €13.8 billion, up from €12.9 billion in 2011. 2012 R&D expenditure accounted for 12.4% of total turnover. The value of R&D spending has remained relatively flat over time, as has its proportion of total turnover (Figure 5.14 below). 80% of R&D funding comes from private industry for civil aeronautics, whereas for military aeronautics more than 60% is funded by public expenditure.

Figure 5.14: European Aeronautical R&D Expenditure 2007-2012

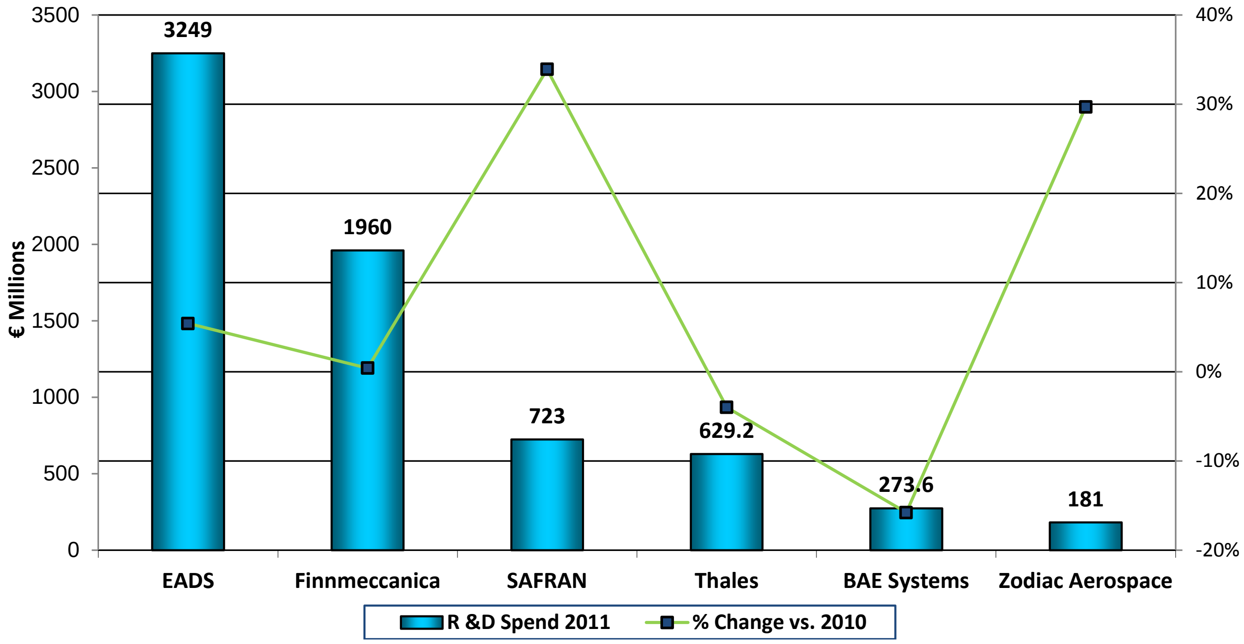


Source: ASD

[52] Science, technology and innovation in Europe, 2010 edition, Eurostat, European Commission

According to the EU Industrial R&D Investment Scoreboard, released in 2012, Aerospace R&D expenditure grew 6% in 2011 versus 2010. US R&D expenditure increased by just 1.1%. Aerospace R&D expenditure ranks eight across all industries on a global scale and increased by 3.9% on the 2010 figure. Airbus increased its year-on-year R&D expenditure by 5.4% in 2011, whilst Boeing's R&D expenditure declined 4.8%, not helped by the realignment of resources to assist with delays to the 787 program. Embraer increased its R&D expenditure by 73% in 2011, no doubt largely as result of development of the E-Jet E2 regional jet and KC-390 military transport aircraft[53].

Figure 5.15: Leading European Aerospace Companies by R&D Spend



Source: ASD

The Advisory Council for Aviation Research in Europe (ACARE) has set a clear agenda on the strategic direction of the aerospace industry. It has set the firm goal of becoming the global leader in aeronautics by 2020 and as such research programmes are aimed at enhancing the competitiveness of European industry and innovations in the aviation system (e.g. SESAR, Clean Sky JTI). This goal appears credible given the high level of funding for aeronautics research by government and private industry, plus rapidly growing effectiveness stemming from better coordination and cooperation on the basis of common research objectives.

[53] 2012 EU R&D Scorecard, European Commission, May 2013

A long-term vision of aviation in Europe, 'Flightpath 2050' was prepared in 2011 by a high-level group from aviation and aeronautics research companies. The vision for 2050 lays out how and where the European research priorities should be set to bring clear EU-added value, so as to preserve EU growth and competitiveness worldwide, whilst meeting market needs as well as energy and environmental challenges. The latest addition to the vision, WG1, was published in June 2012 and outlines the necessity of all aviation stakeholders, including the consumer, to move towards a Strategic Research & Innovation Agenda (SRIA). The timeline for this agenda is set in 3 main stages; 2020, 2035 and 2050.

1. Key to the delivery of the objectives under "Flightpath 2050" are three core areas:
2. "Creating the basis" – Customer centric mobility
   a. Understanding the transport customer and society in general
   b. Understand the effect of new transport methods on the transport system
   c. Design of a transport vision model
   d. Continuous research and innovation
3. Travel Process Management – Integrated transport
   a. Development of a comprehensive, interactive travel management tool
   b. Availability of a full range of travel choices for customers and "Intelligent Travel"
   c. More effective and protective disruption and crisis management mechanisms
4. Aviation – Aviation services
   a. Integration of all air transport-related infrastructure modes, including ground infrastructure
   b. Ensure a harmonized approach to the environmental effects of air transport modes
   c. Improvement of air traffic information, communication, navigation and management.
   d. Improved system intelligence and use of automation where possible.

Figure 5.16: Flightpath 2050 Goals

Target	2020	2035	2050
Customer-centric Mobility	Evolution of customer mobility Greater Society Understanding Evolution towards single ticketing Improved Data Protection and Privacy	Door-to-door integrated travel Automated journey monitoring Real-time communication and journey guidance	Intergrated ticketting, journey monitoring and disruption management for over 90% of journeys
Integrated Transport	Aviation at core of integrated transport Intermodal transport standards More collaboration between transport entities	Real-time mobility modelling Full choice of transport modes Mobility plans for disruptions Optimised processes and interfaces	Full integrated intermodal transport systems Infrastructure development in line with mobility needs
Aviation Services	Design of innovative passenger, luggage and cargo processes Integration of airport services/ATM Improved disruption management	Fully integrated innovative airport services and vehicles Optimised airport infrastructure and technologies	Improved Punctuality (1 minute accuracy) Sustainable infrastructure Congestion Eliminated

Key environmental initiatives under Flightpath 2050 combined with advanced technology aim to reduce CO_2 emissions by 75% and reduce NOx (Nitrogen Oxide) emissions by 90%. Aircraft ground movements will be emission free and all aircraft and support vehicles will be built from recyclable materials. The principal aims under Flightpath 2050 are ambitious but necessary to ensure Europe retains its competitive position. The R&D objectives under Flightpath 50 include greater collaboration between industry, universities and research institutes; the development of strategic European test and development facilities; and greater alignment with aviation industry requirements across European Universities.

US companies invested approximately USD 12.9 billion of their own resources in R&D activities in 2011, up 5.9% on the previous year – over half of total global privately-funded aerospace R&D spending[54]. Canadian aerospace manufacturers have increased R&D input by 40% in the period from 2007 and 2012, no doubt boosted by Bombardier's development of the C-Series narrowbody airliner and Pratt & Whitney Canada's investment in new engine technology. Overall, Canada's aerospace firms contributed 18% of revenue to R&D activities, equating to USD 4.1 billion.

5.3 The Global Aircraft Fleet in 2012

The data source used to analyse global aircraft fleets and forward orders is Flightglobal's ACAS database, updated at December 2012. The data used represents current airline fleet details as of December 2012, with forward orders up to and including those placed in 2012. No account is taken of aircraft orders placed in 2013.

Aircraft types have been assigned a market grouping due to their size/seat capacity category. Table 5.3 identifies aircraft types by market group, as used in the analysis contained in this section:

Table 5.3: Global Aircraft Fleet Classification & Market Grouping

Widebody Jet	Narrowbody Jet	Regional Jet	Turboprop
Airbus A300	Airbus A318	Antonov 148	ATR 42 / 72
Airbus A310	Airbus A319	BAe 146	BAe Jetstream 31/32/41
Airbus A330	Airbus A320	Bombardier CRJ	Beech 99 / 1900 / King Air
Airbus A340	Airbus A321	Dornier 328JET	Bombardier DHC8-2/3/400
Airbus A380	Boeing 707	Embraer 170	De Havilland DHC6/7/8
Boeing 747	Boeing 717	Embraer 175	Dornier 228/328
Boeing 767	Boeing 727	Embraer 190	Fokker F27/F50
Boeing 777	Boeing 737	Embraer 195	Fairchild Merlin/Metro
Boeing 787	Boeing 757	Embraer ERJ-135	Britten Norman Islander
McDonnell-Douglas DC-10	McDonnell-Douglas DC-8	Embraer ERJ-140	Let 410
McDonnell-Douglas MD-10	McDonnell-Douglas DC-9	Embraer ERJ-145	Saab 2000/340
McDonnell-Douglas MD-11	McDonnell-Douglas MD-80	Fokker 100	Antonov AN12/24/26
Ilyushin 86	McDonnell-Douglas MD-90	Fokker F28	Cessna 208
Ilyushin 96	Ilyushin 62	Sukhoi Superjet 100	Piaggio 180
	Tupolev 154	Tupolev 134	Shorts 330/360
		Yakolev 40	Embraer EMB-110/120
		Yakolev 42	Pilatus PC12

Source: JP Fleets

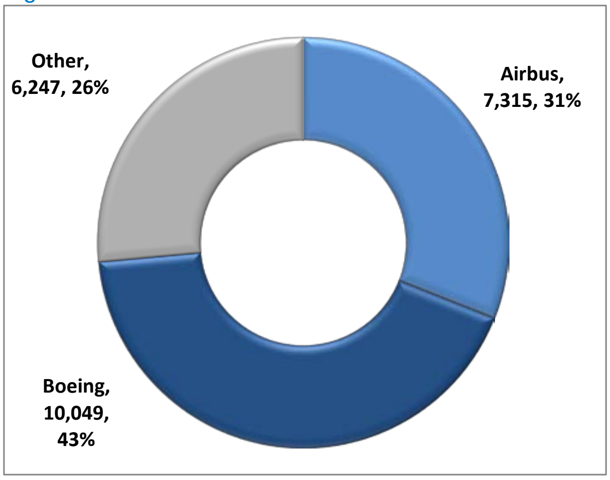
Where analyses by world region are undertaken, aircraft are assigned to the geographically defined region to which its country of registration belongs.

[54] Global R&D Funding Forecast, A P L U, January 2012

5.3.1 Global Civil Jet Fleet Overview

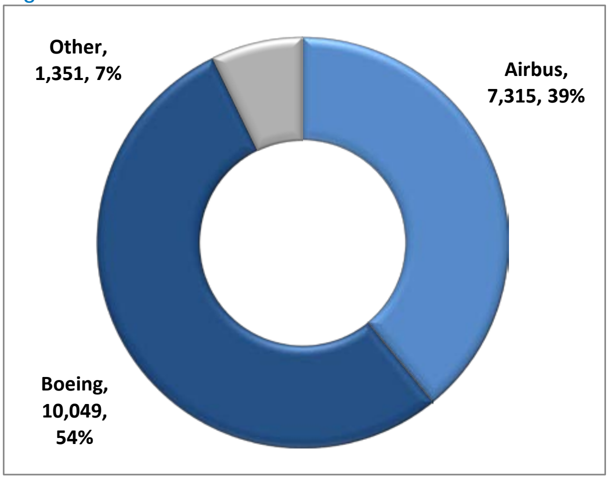
As of December 2012, Boeing and Airbus aircraft make up nearly three quarters of the global fleet market share for civil airliner jets (which comprise regional, narrowbody and widebody aircraft, excluding turboprops), with Boeing accounting for a greater share of the total (43%) compared to Airbus (31%) (see Figure 5.17). In 2011, the respective figures were 42% and 31%. The remaining 26% is dominated by Embraer and Bombardier as active manufacturers in the regional jet sector.

Figure 5.17: Share of Global Civil Airliner Jet Fleet 2012



Source: Flightglobal ACAS

Figure 5.18: Share of Global NB & WB Jet Fleet 2012



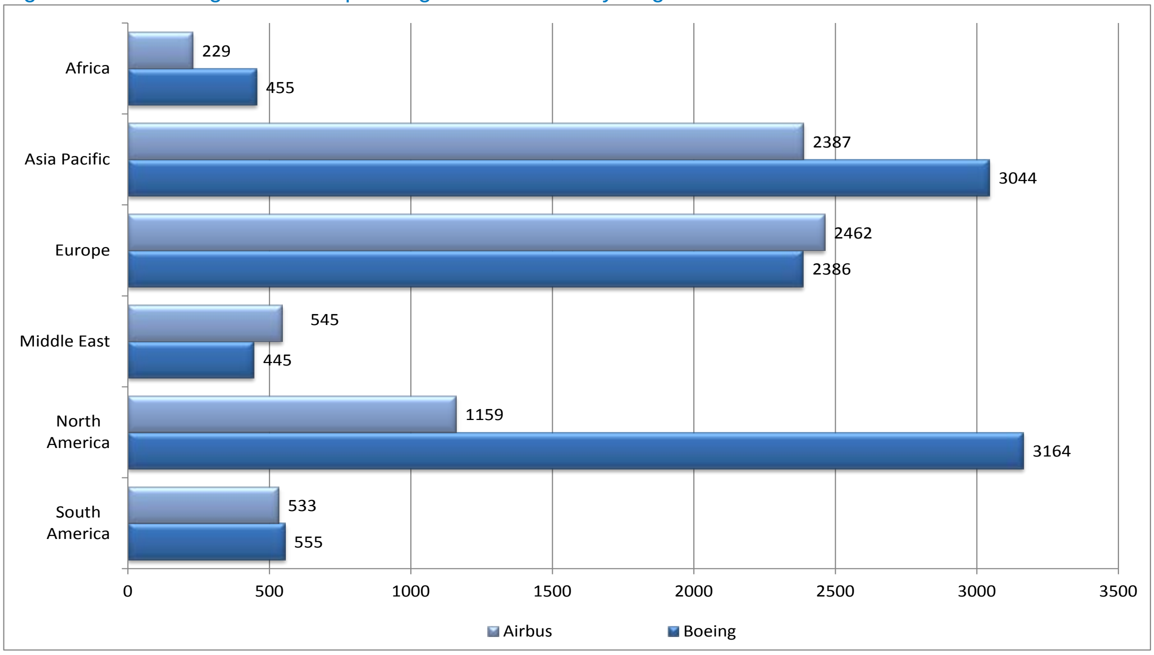
Source: Flightglobal ACAS

Neither Boeing nor Airbus competes in the regional jet market which makes up a smaller overall share of the civil airliner fleet (approximately 16%). Excluding regional jets from this analysis to focus on narrow and widebody aircraft reveals a significant duopoly (Figure 5.18). Indeed, Boeing and Airbus are the western manufacturers actively producing commercial passenger aircraft in the narrowbody and widebody sectors.

5.3.1.1 Jet Aircraft Fleets by Region

Figure 5.19 shows a breakdown of the global fleet in a regional context, highlights the major markets for civil airliner jets and indicates the degree of competition between Boeing and Airbus in those regions.

Figure 5.19: Boeing & Airbus Operating Civil Jet Fleet by Region 2012



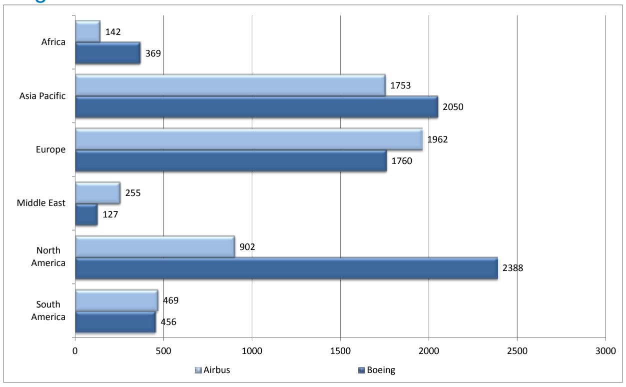
Source: Flightglobal ACAS

As can be expected given the size of the fleet of out of production aircraft in the United States, Boeing's stronghold is its home market of North America, where it accounts for 73% of the civil jet fleet in that region. Airbus has been slowly growing its market share as US operators re-fleet with A320 family aircraft. It might be expected for Airbus to be stronger than Boeing in Europe but this is not the reality – Airbus has a slight one% advantage over its rival amongst European carriers.

The Asia-Pacific region has been a key battleground for the two manufacturers throughout the last two decades. Boeing has gained market share through its dominance of the dense air transport market in Japan. Airbus has an established physical presence in the Asia Pacific region with its first final assembly production line (dedicated to A320s) outside of Europe established in Tianjin, China. The Japanese manufacturing industry has a heavy presence in current-production Boeing twinjet programs, whilst China has grown its supply chain role in both Boeing and Airbus products.

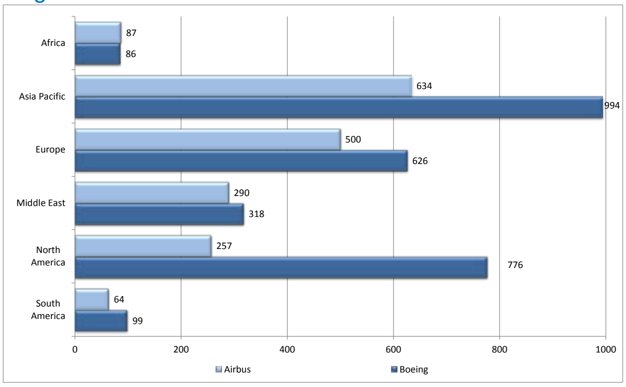
Figure 5.20 and Figure 5.21 consider the regional situation when the global fleet is separated into narrowbody and widebody aircraft types. The three regions with the greatest concentrations of narrowbody types are North America, Europe and Asia Pacific; together they account for 84% of the 2012 global total, slightly down on 2011 reflecting fleet growth in emerging regions. Again, Boeing dominates the North American narrowbody market with almost 73% of market share. For widebodies, the popularity of the Boeing 777 in the Asia Pacific region has enabled the US manufacturer to command over 60% of market share in the region.

Figure 5.20: Boeing & Airbus Narrowbody Jet Fleet by Region 2012



Source: Flightglobal ACAS

Figure 5.21: Boeing & Airbus Widebody Jet Fleet by Region 2012



Source: Flightglobal ACAS

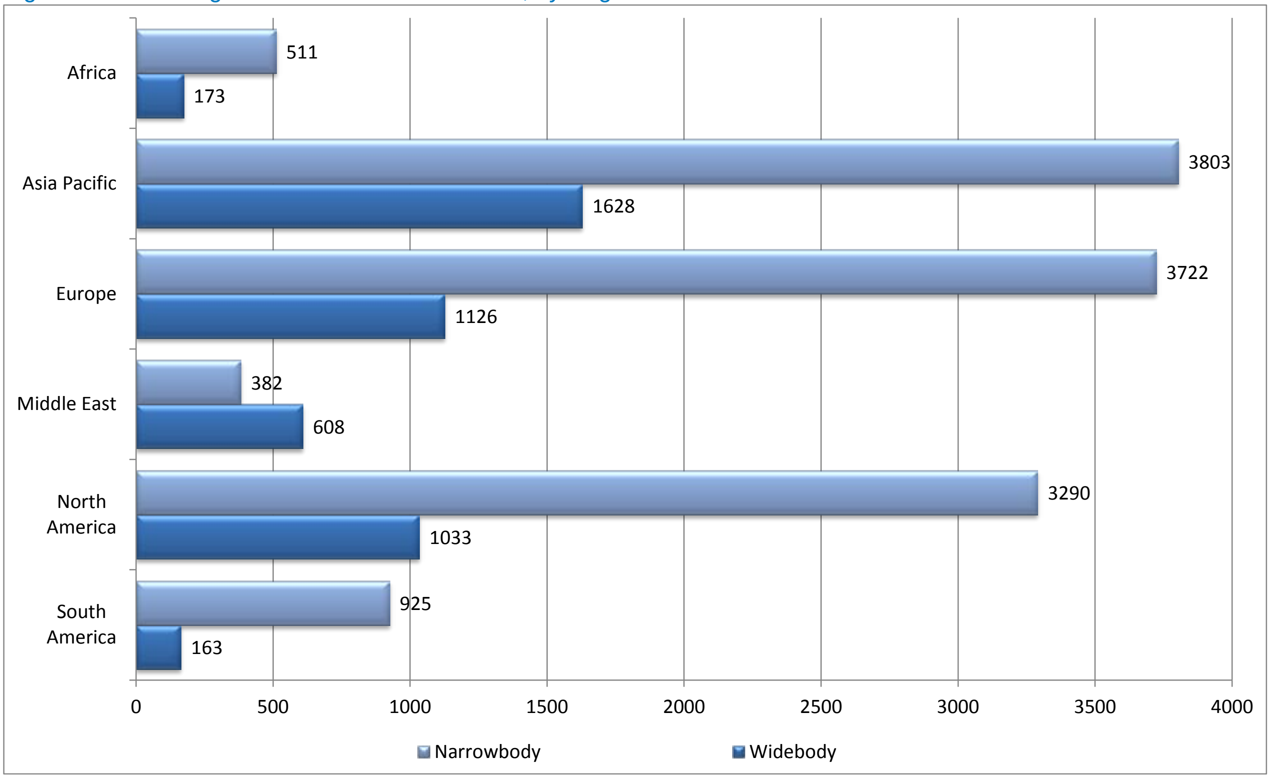
Figure 5.22 shows the consolidated Boeing and Airbus aircraft fleets by narrowbody and widebody categorisation, by world region.

The continued rise of low cost carriers (LCCs) and growth of hub and spoke networks has supported the continued popularity of narrowbody aircraft. Narrowbody aircraft have dominated Boeing and Airbus order books in recent years.

Boeing reports that in Europe, single aisle aircraft will account for 70% of new deliveries through to 2032 – the percentage will be even higher in Europe given its suitability for large short-haul fleets[55]. By comparison the greatest concentration of the widebody (twin aisle) fleet can be found in Asia Pacific, where the long distances involved in some city pairs suit medium-to-long-haul, high capacity models. Nevertheless, the burgeoning LCC (Low-Cost Carrier) growth in the region is contributing to 69% of new aircraft deliveries by 2032 being narrowbody aircraft.

[55] Boeing Current Market Outlook 2013-2032

Figure 5.22: Boeing and Airbus civil aircraft fleet, by Region in 2012



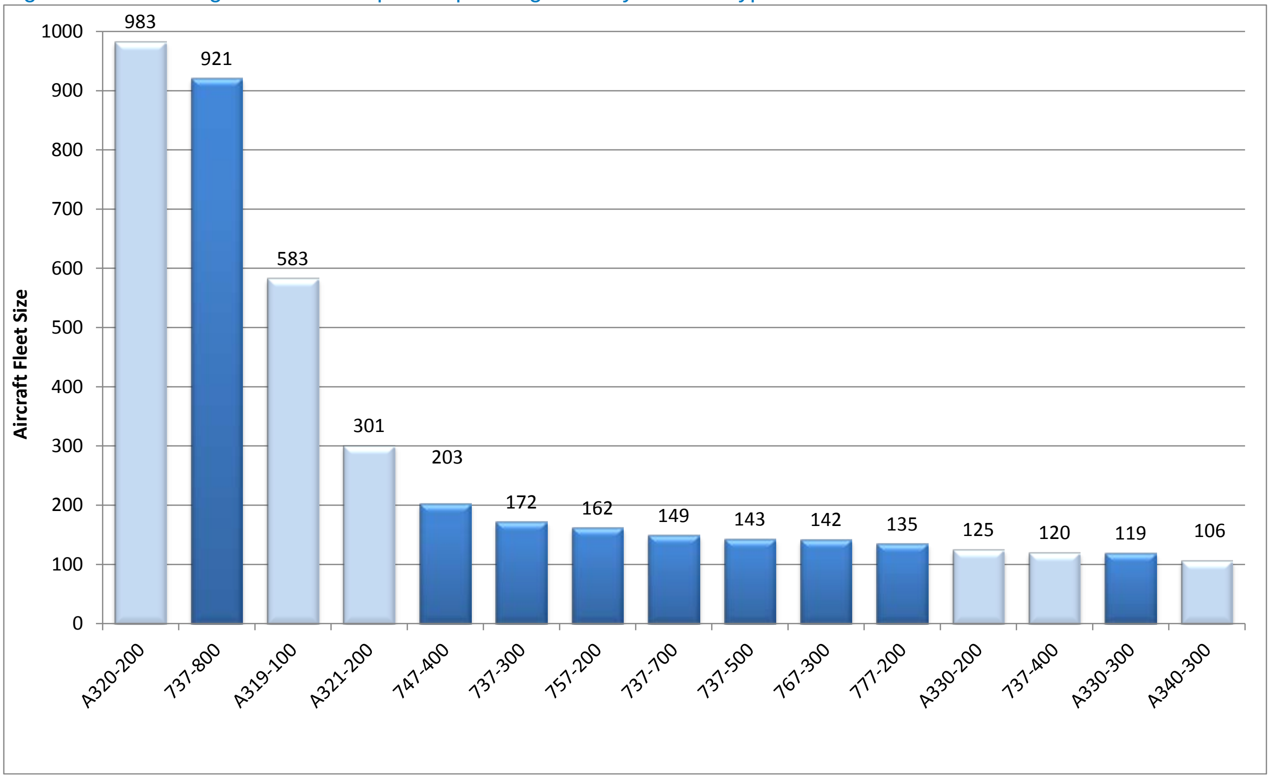
Source: Flightglobal ACAS

5.3.1.2 The Boeing & Airbus Fleet in Europe

Looking at the composition of the Boeing and Airbus fleets in Europe in 2012, Figure 5.23 shows the aircraft type distribution based in the region. Whilst the top five aircraft fleets in 2011 were all narrowbodies, the declining 737 Classic operating fleet means that the 747-400 is now in fifth place ahead of the 737-300. As was the case in 2011, just two widebody types are in the top ten Boeing and Airbus aircraft fleets in Europe. Overall the share between the two rivals is even, with precisely just over 50% of the top 15 aircraft type fleet in Europe manufactured by Airbus.

The European Boeing and Airbus fleet is 77% comprised of narrowbodies. Of the top five narrowbody types, Airbus commands 65% of this share. The 737-800 has narrowed the gap to the A320 in terms of fleet size from 128 in 2011 to just 62 in 2012, reflecting increased production rates from the US manufacturer.

Figure 5.23: Boeing & Airbus European Operating Fleet by Aircraft Type 2012



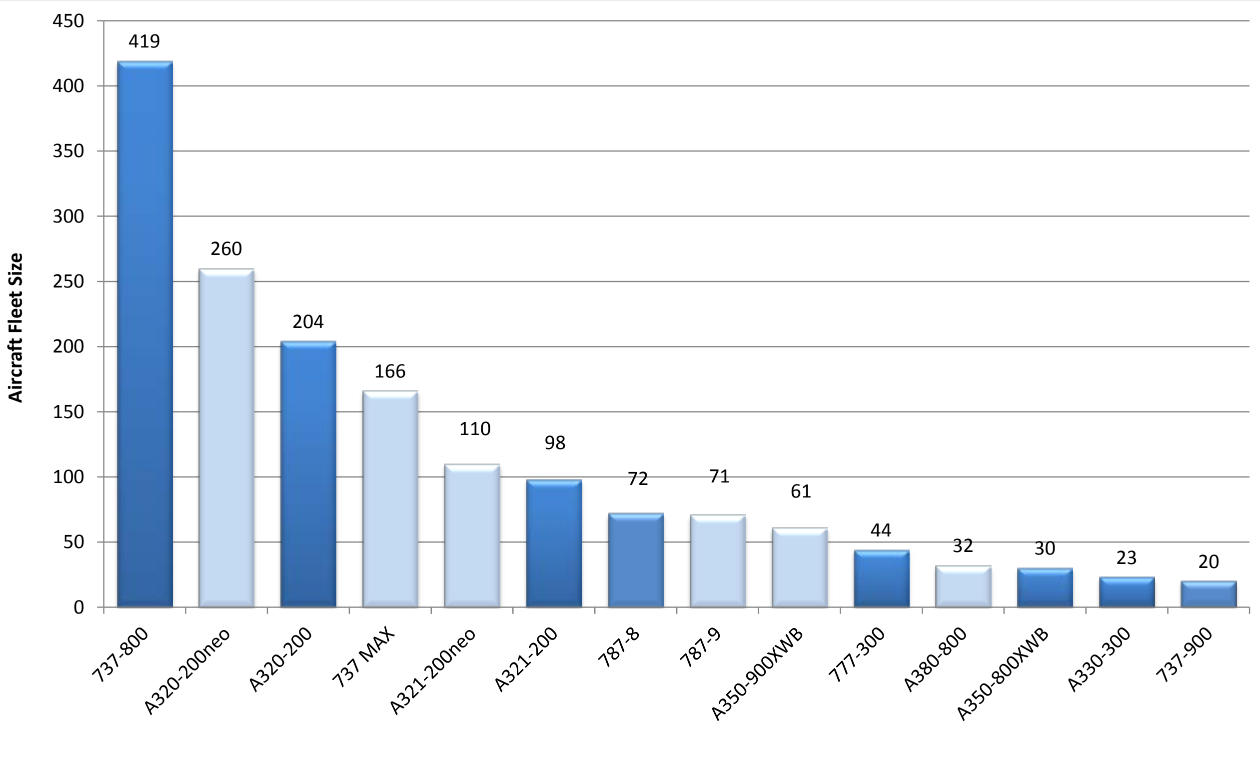
Source: Flightglobal ACAS

5.3.2 Jet Fleet Orders & Deliveries

Figure 5.24 shows the current number of forward orders for Boeing and Airbus aircraft types in Europe. The data shown is for the undelivered backlog of all historical orders up to the end of 2012. The data does not include orders placed in 2013. The Boeing 737-800 remains the most popular aircraft in terms of forward orders and is a favoured type among European low cost carriers such as Ryanair, Air Berlin and Norwegian Air Shuttle. Other large 737-800 operators include mainstream carriers such as KLM and SAS.

The strong initial sales of the A320neo family have had a positive effect on the Airbus orderbook and it has a narrow advantage over its US rival in terms of forward order market share. Despite the popularity of Boeing and Airbus current production and new technology twin-engine widebodies, narowbody aircraft comprise approximately 80% of orders to the end of 2012, which is consistent with Boeing's prediction that single-aisle aircraft will predominate to the end of its current forecast period of 2031.

Figure 5.24: Top Boeing & Airbus European Forward Orders by Aircraft Type in 2012

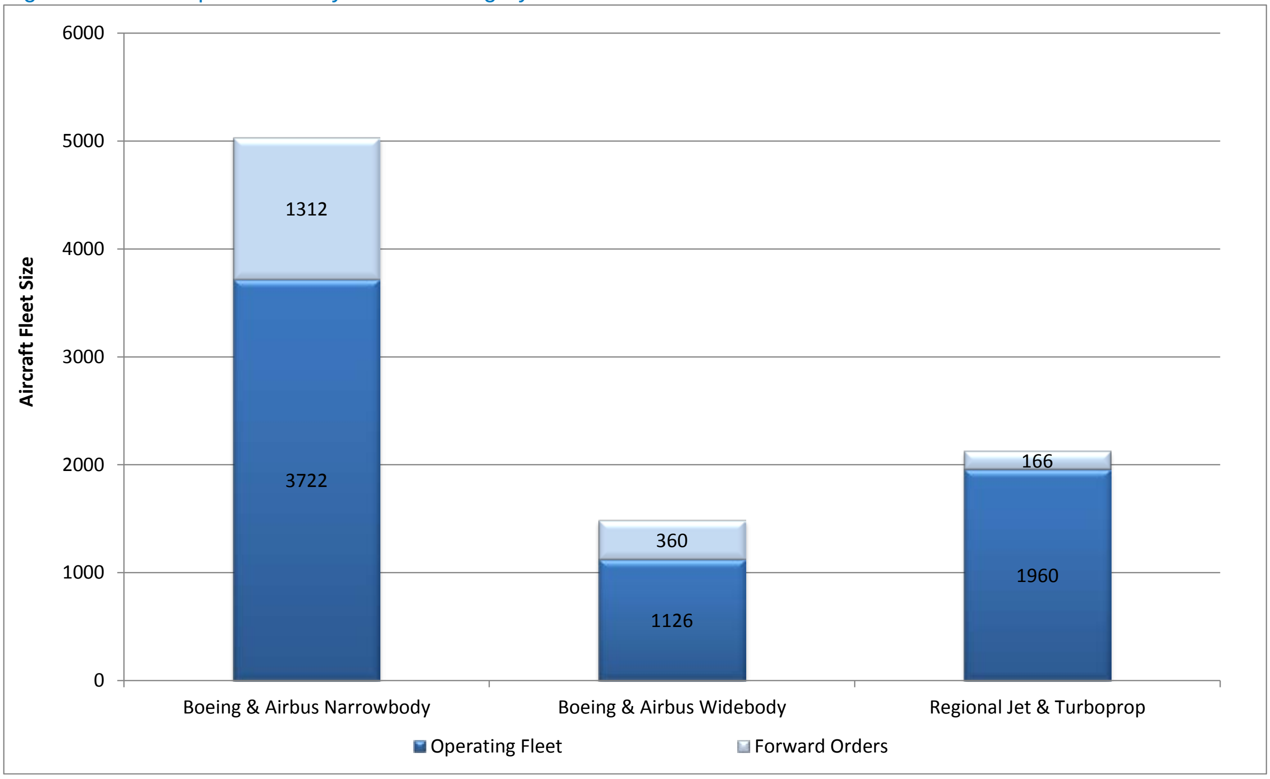


Source: Flightglobal ACAS

Figure 5.25 summarises the fleet status in Europe by aircraft market group, combining figures for the current operating fleet and forward orders. The high number of narrowbody, regional jet and turboprop aircraft reflects the geographically compact nature of Europe's aviation network, the volume of short-haul city pairs particularly compared to other regions such as Asia-Pacific and the continued growth of the LCC sector. These aircraft account for over 80% of the European order book, reflecting the appeal of newly-launched aircraft and the increasing popularity of 70+ seat regional jets. By adding the current fleet and forward orders for narrowbody, regional jet and turboprop aircraft models, it is clear to see that they will continue to dominate the European fleet mix at 83% of the total.

Whilst widebody types continue to be the minority in terms of this fleet mix at just 17% of the current fleet, almost 20% of orders are for widebody types, reflecting the re-fleeting strategies of European operators keen to avail of lower fuel burn on medium-to-long-haul routes. The new technology 787 and A350 lead the way in terms of the widebodies on backlog, whilst the 777-300ER and A330-300 continue to capture sales. Indeed, twinjets make up over 90% of Europe's widebody backlog, reflecting their suitability on competitive routes over the North Atlantic and to the Middle East.

Figure 5.25: European Fleet by Aircraft Category 2012



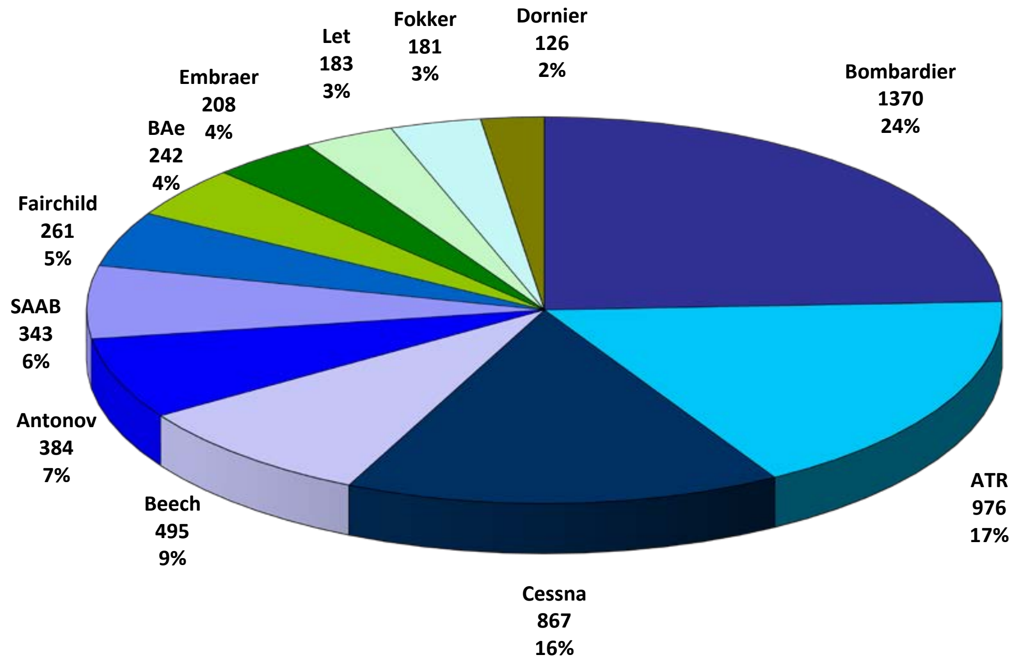
Source: Flightglobal ACAS

5.3.3 Global Civil Passenger Turboprop Fleet

The civil passenger turboprop aircraft market is smaller than the jet market but still significant. As of 31st December 2012, Flightglobal's ACAS database recorded 5,621 civil passenger and cargo turboprop aircraft in service at a global level. Aircraft in this market range from an eight-seat Cessna 208 at one end of the scale to 70+ capacity ATR 72 and Bombardier Q400 aircraft at the other. These aircraft are typically used on short-haul feeder routes where narrowbody capacity is not required or cost-effective.

Numerous manufacturers compete in the civil passenger turboprop aircraft market. Figure 5.26 illustrates the market share of the major companies in 2012. The top three manufacturers – Bombardier, ATR and Saab – command almost 60% of the market.

Figure 5.26: Manufacturers of civil turboprops by market share 2012



Source: Flightglobal ACAS

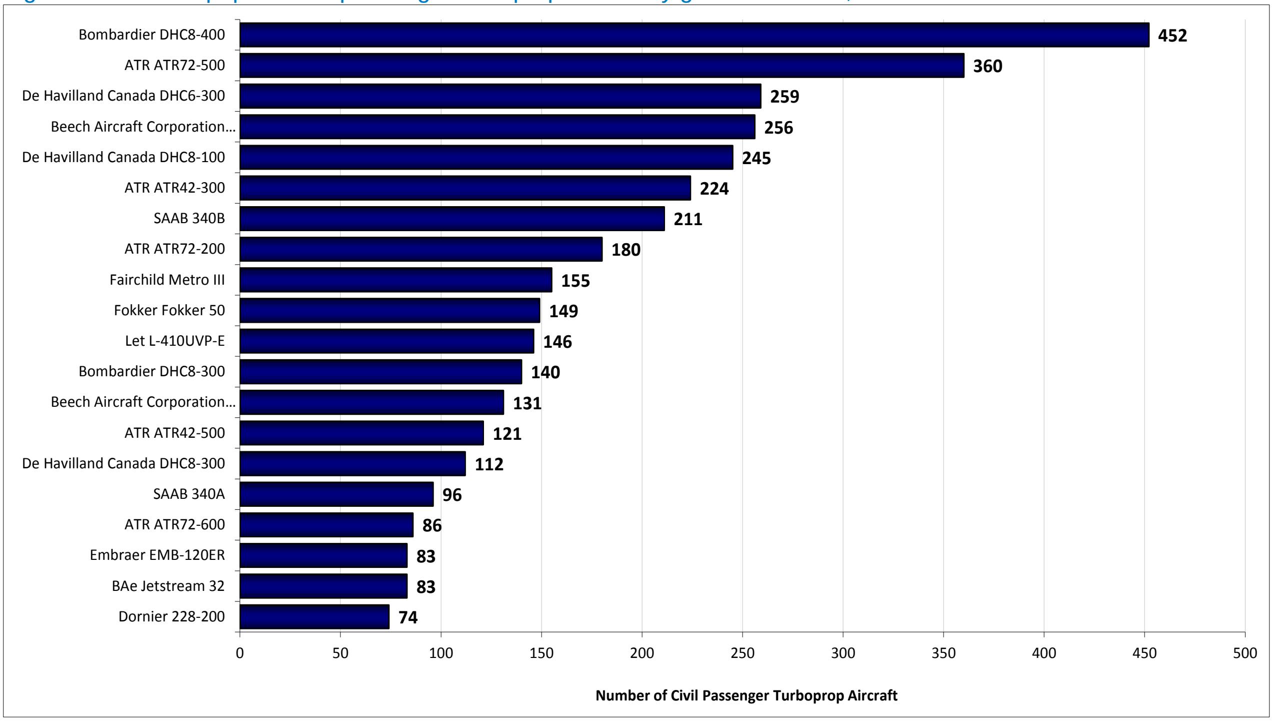
Figure 5.27 shows the most popular civil passenger turboprop aircraft by global fleet size as recorded in 2012.

Bombardier's single most successful turboprop is the 78-seat DHC8-Q400, with its sister DHC8-100/200/300 models in the 30-50 seat range also retaining high levels of demand across the world. De Havilland Canada (now part of Bombardier) used to produce the 19/20-seat DHC6-300 (Twin Otter), but it is now being manufactured by Viking Air. ATR's best-selling aircraft is the 70-seat ATR 72, followed by the 48-seat ATR 42. Recent updated variants of these two models have enhanced the appeal of the ATR aircraft family. Beech Aircraft Corporation is responsible for the 19-seat Beech 1900 commuter aircraft, popular in North America and Africa as well as points around the Pacific Rim.

Other civil passenger turboprop aircraft with significant fleets include the Czech-built 19-seat Let L-410 and Soviet Union/Ukraine-built 40-seat Antonov AN-24/AN-26. The Let-L-410 is a robust aircraft in high demand in remote or undeveloped parts of Africa and South America where terrain is rough and good runway performance is required. The largest markets for the Let fleet are Europe and Africa, each with 27% of the fleet. It is worth noting, however, that storage numbers are relatively high. The AN-24/AN-26 is very popular among Russian and CIS operators, with nearly 70% of the world's AN-24 fleet registered in geographical Europe. It is worth noting that a very high proportion of the global fleet (27%) is listed as stored. The SAAB 340 regional turboprop airliner has found favour in all global regions but the Middle East. Europe has the largest SAAB 340 fleet of all world regions, at 33%, followed the North America (32%) and Asia-Pacific (25%).

In the Asia Pacific region, the ATR 72 remains the most popular turboprop aircraft type in operation, representing just under 20% of the fleet, including an 18-strong fleet of the latest ATR 72-600 series upgrade. The DHC6-300 Twin Otter is the next most popular aircraft model in the region accounting for approximately seven% of the turboprop fleet.

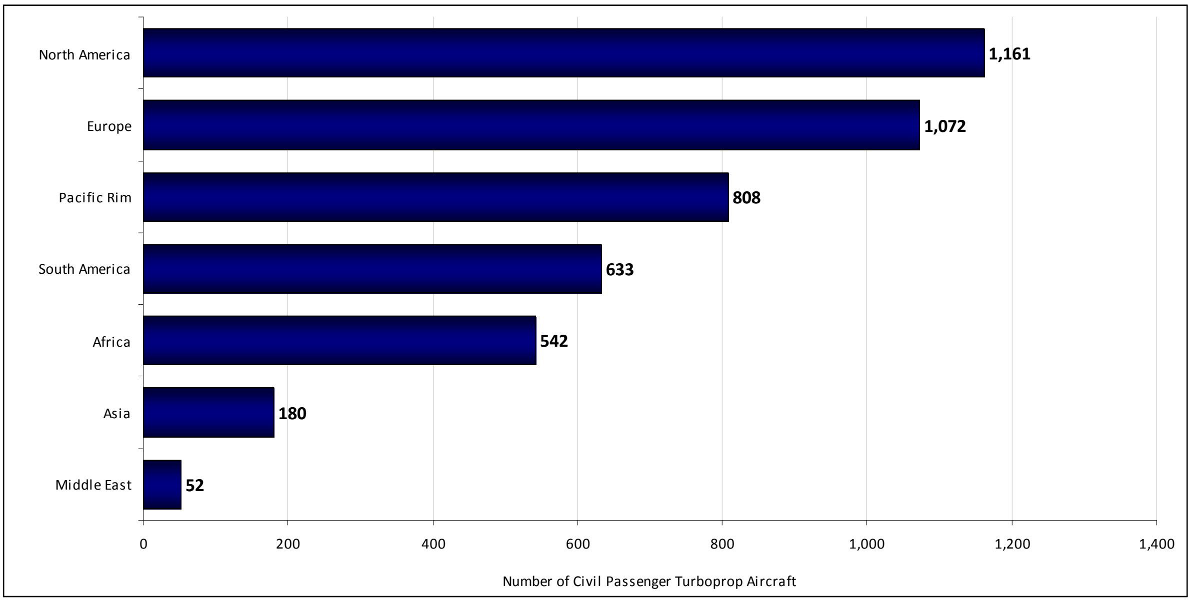
Figure 5.27: Most popular civil passenger turboprop aircraft by global fleet size, in 2012



Source: Flightglobal ACAS

As was the case in 2011, the global distribution of civil passenger turboprop aircraft in 2012 (Figure 5.28) reveals that airlines in Europe and North America maintain the highest concentrations of these aircraft, followed by Asia Pacific. These North American and European markets are the most mature in terms of structure and have well-defined hub and spoke networks. Mainline operators at busy airports are often fed by regional airlines from regions without sufficient demand for narrowbody aircraft. In the United States in particular, the large legacy operators have branding arrangements with regional turboprop operators allowing them to retain a market presence in areas of low demand.

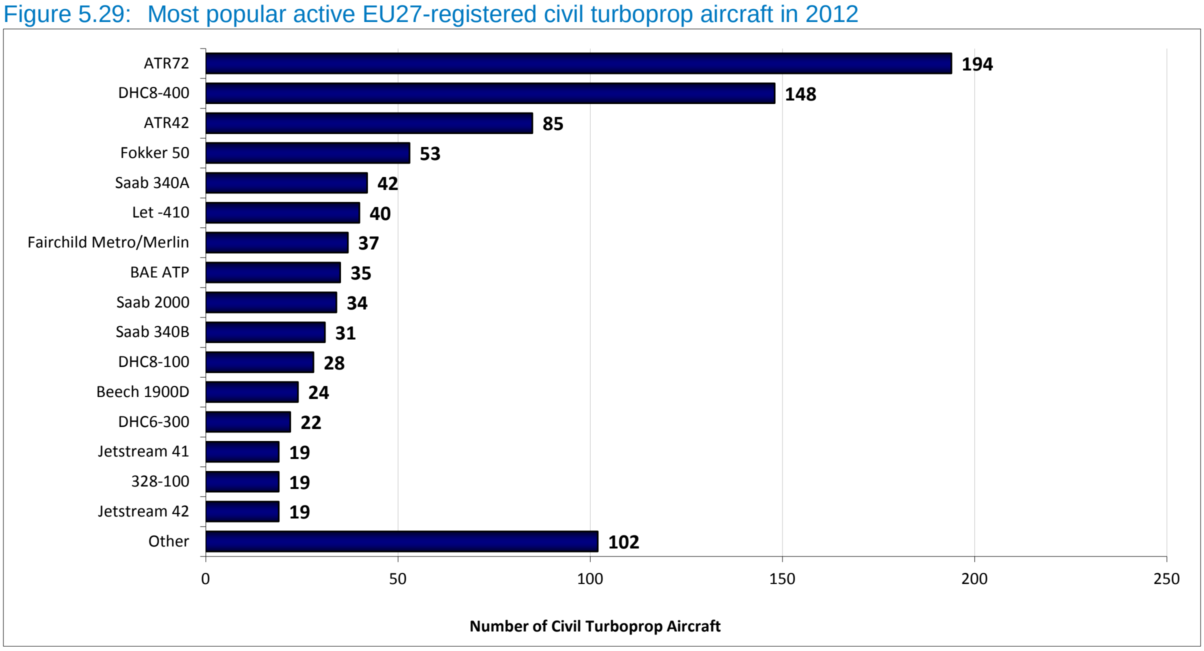
Figure 5.28: Global Civil Passenger Turboprop Fleet by Region in 2012



Source: Flightglobal ACAS

According to Flightglobal's ACAS database as of 2012, some 932 regional turboprop aircraft are in service in the 27 countries of the European Union. Figure 5.29 shows that the larger 70+ seat DHC8-Q400 and ATR 72 are by far the most popular aircraft types in this category in the EU. The ATR72 comes in three main variants – the older 200 series, the popular -500 series and the new production enhanced -600 series offering. ATR's smaller variant, the ATR 42, competes with the Fokker 50 and Saab 240 for market share. It is worth noting that the ATR 42 remains the only one of these aircraft types still in production.

Figure 5.29: Most popular active EU27-registered civil turboprop aircraft in 2012



Source: Flightglobal ACAS

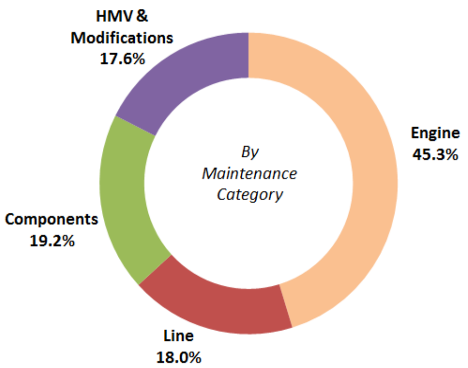
5.4 Maintenance, Repair & Overhaul (MRO)

The acronym MRO describes any maintenance or engineering function in the aviation industry involving the airframe, engines, landing gear, auxiliary power units (APUs), avionics, thrust reversers, fuel systems, electrical systems, hydraulics and other components of an aircraft. Maintenance can be scheduled in accordance with regulatory requirements and also in response to various defects as they arise.

5.4.1 Global MRO Activity

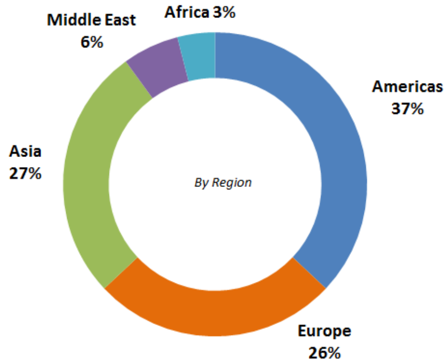
The global value of civil air transport MRO spend in 2012 was USD 49.5 billion, up 5.5% from the USD 46.9 billion achieved in 2011. The greatest proportion of MRO activity is due to engine maintenance, at 45%[56].

Figure 5.30: Global MRO Activity by Category 2012



Source: ICF SH&E

Figure 5.31: Global MRO Market Share 2012



Source: ICF SH&E

The regional distribution of MRO activity is directly comparable to the global air transport market as a whole. While North America and Western Europe currently have the largest aircraft fleets and MRO markets, the growth areas lie in emerging regions – particularly China, India and Eastern Europe. These regions are growing quickly, but their overall size currently represents a small proportion of the total MRO market.

The 5.5% rise in maintenance spend seen in 2012 reflects the continued recovery in the industry, albeit modest. There was a significant drop in Western-built aircraft retirement rates versus 2011 which reflects improving market conditions and aircraft utilisation levels (up 1.9% versus 2011) [24]. OEM list price escalation rates have also had an impact on spend whilst a shortage of skilled engineers is increasing man-hour labour rates. MRO consolidation trends are also reducing the opportunities to avail of lower labour rates in MROs in developing regions.

Deferred maintenance practices and the increased reliability of engine technology has kept engine spend steady in comparison with 2011, whilst a 1% increase in the market share of line maintenance spend reflects increased aircraft utilisation levels. The proportion of spend on components has increased whilst

[56] The Global MRO Forecast , TeamSAI, MRO Asia , November 2012

[24] The Global MRO Forecast , TeamSAI, MRO Asia , November 2012

there has been a significant drop in Heavy Airframe and Modifications reflecting to increasing number of new aircraft on the market as older aircraft are retired.

The same challenges facing operators are being passed on to MROs as the former look to reduce their cost basis in the face of increased fuel costs, which now sit at approximately 35% of operator spend[57]. As a result, operators are demanding more fuel efficient aircraft. Boeing and Airbus have responded by increasing monthly production rates. Aggressive pricing combined with favourable financing is enabling operators to place large bulk aircraft orders. Developing countries, previously target markets for secondary market aircraft are imposing age restrictions on imported aircraft and ordering new aircraft instead. The airframe OEMs are also following engine OEMs trends and engaging in long term maintenance support agreements with operators. Whilst the OEMs are clearly responding to reduced aftermarket parts demand due to the requirement to produce more reliable aircraft, they are also attempting to limit the impact that surplus parts are having on demand. Airbus has signed a number of agreements in 2012 for its 'Flight Hour Service'[58] support program for A320, A330 and A380 aircraft.

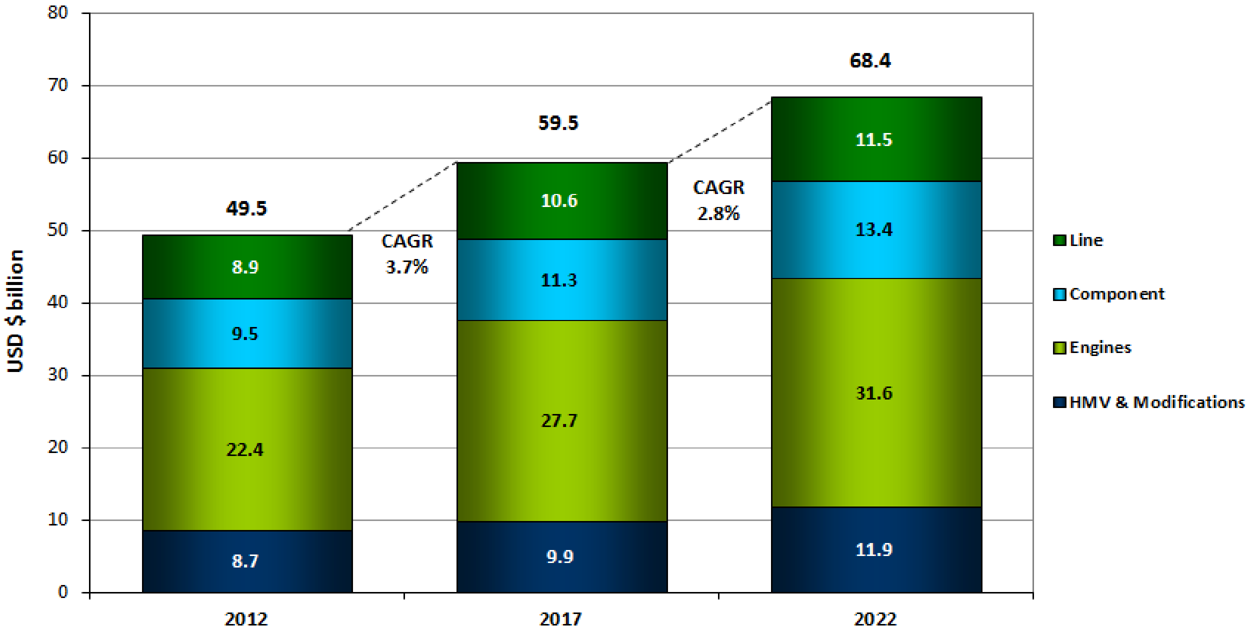
A key issue for future MRO demand is the potential for a reduction in the economic usable lives of aircraft. A number of market dynamics are driving this trend, including the rate at which replacement technology aircraft is coming on to the market. This has contributed to a degree of oversupply on the market, particularly in the 130-200 seat sector. Operators are becoming increasingly reluctant to invest in later-life heavy maintenance on aircraft and MROs are not seeing enough maintenance input demand on newer technology aircraft to counteract this trend. This issue is particularly pertinent on 737NG and A320 engine fleets, whereby the likelihood is that a significant number of engines will only have two heavy shop visits throughout their lifecycle before retirement. It is worth noting that over 80% of surplus material on the market is from aircraft teardowns with over 6,000 aircraft forecast to be retired between 2013 and 2022[59]. The MROs are also facing challenges in terms of training and capability development for new technology aircraft, such as the Airbus A350XWB and A380 as well as the Boeing 787.

[57] Facts and Figures, Air Transport Action Group, March 2012

[58] Flight Hour Services, Airbus Press Centre, January 2013.

[59] MRO Market Forecast and Industry Dynamics, ICF SH&E, MRO Americas , April 2013

Figure 5.32: Forecast Global MRO Market Spend by Activity 2012-2022



Source: TeamSAI

Global growth in MRO is expected to average a 3.3% CAGR between 2012 and 2022; growing to USD 68.4 billion over the period (see Figure 5.32). Overall MRO growth is driven by the demand for air transport, in turn driven by economic prosperity and growth in GDP, the expanding middle classes worldwide and the corresponding increase in the global aircraft fleet. The rapid growth of fleets in Asia and India indicates a shift in the regional MRO distribution towards the east, which will eventually see Asia leading the market in terms of MRO spend, ahead of the Americas and Europe.

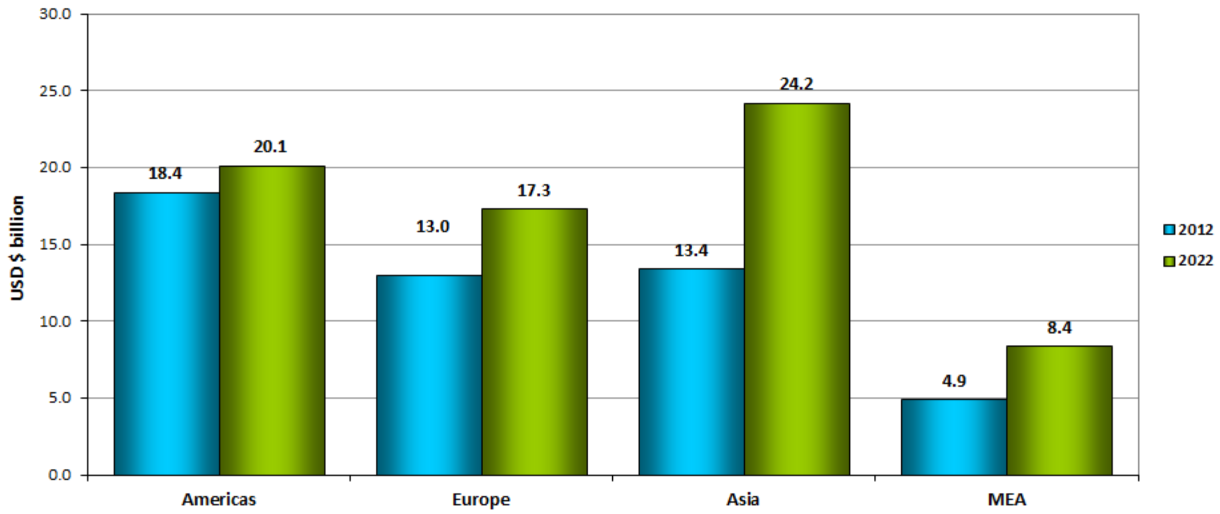
This is being further driven by the increase in MRO outsourcing from Europe, the Americas and the Middle East, where there is an increasing focus on cost controls in airlines, particularly with the growth of low cost carriers. The emergence of efficient MRO and integrated service providers in Asia combined with lower labour costs means that outsourcing work will outpace organic growth in the region. Eventually, the opportunities to be gained by lower labour costs will be diminished as MRO consolidation continues. India and China remain huge potential growth areas. Large re-fleeting plans in North America will mean a continuous annual reduction in the average fleet age in the region for the remainder of the current decade.

Table 5.4: Current & Forecast Global MRO Market Share & Growth Rates by Region 2012-2022

	Americas	Europe	Asia	Middle East/Africa
Market (USD bn) (2012)	18.4	13.0	13.4	4.9
Market Share (2012)	36%	26%	27%	9%
CAGR (2012-2022)	0.9%	2.9%	6.1%	5.5%
Market Share (2022)	27%	29%	32%	12%

Source: TeamSAI (Americas = North America, Latin America & the Caribbean. Asia = Asia Pacific, China & India)

Figure 5.33: Current & Forecast Global MRO Market Share by Region 2012-2022



Source: TeamSAI (Americas = North America, Latin America & the Caribbean. Asia = Asia Pacific, China & India)

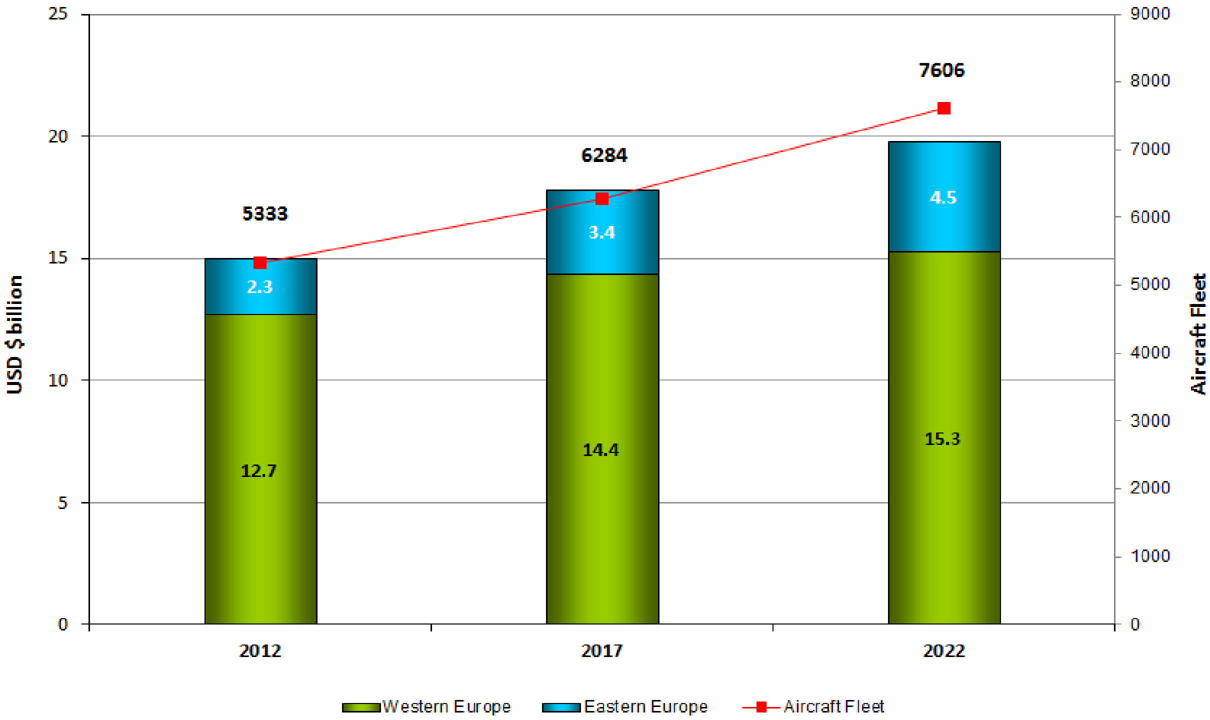
As can be seen in Figure 5.33 the dominance of the mature American and European MRO markets is predicted to come to an end as Asia develops into a major market, displaying the highest overall growth in the period to 2022 with a CAGR of 6.1%. The size of regional markets in absolute terms in 2012 and 2022 are illustrated in Table 5.4, showing that Asia is set to become the largest MRO market by 2022 with a value of USD 24.2 billion[24].

5.4.2 MRO Activity in Europe

The market value of MRO in Europe in 2012 was USD 13 billion. Overall, Europe can expect a moderate annual average growth in MRO activity over the next ten years at the rate of 2.9%, which is predominantly driven by change in the total aircraft fleet. The fleet itself is forecast to grow at a CAGR of 3.6% to 2022 across all aircraft types (Figure 5.34).

[24] The Global MRO Forecast , TeamSAI, MRO Asia , November 2012

Figure 5.34: European Forecast MRO & Aircraft Fleet 2012-2022



Source: TeamSAI

As a mature market, Western Europe will experience 2.6% annual average growth over the same period. Fleet growth projections have dropped somewhat since 2012, mainly due to more aggressive aircraft retirement schedules. This modest growth rate is below the global average as a result of the depressed economic growth in the region and on-going austerity policies by the governments of several member states. Nevertheless, Europe is still expected to see its MRO spend grow by approximately USD 5 billion by 2022, which reflects the size and scope of the European MRO sector[24].

Eastern Europe is among the worldwide regions displaying the highest annual growth. The Eastern European MRO segment is expected to grow from its current proportion of 15% of the European market to approximately 23% in 2022[24]. Eastern Europe, unlike other regions, continues to operate large numbers of older more maintenance-intensive aircraft, such as the 737 Classic, and this is seen as a key driver of the region's increasing MRO spend as is the rapid growth of carriers such as Wizz Air and Transaero.

[24] The Global MRO Forecast , TeamSAI, MRO Asia , November 2012

6. Air Traffic Management

6.1 Introduction

This chapter describes the key events in Air Traffic Management (ATM) in 2012.

Now that the initial Reporting Period 1 (RP1) of the SES II Performance Scheme has started, focus has moved onto the assessment of current performance and on the proposed regulatory and performance target setting approach for the next reporting period, RP2, which runs for five years from 2015 to 2020.

Although revised performance plans collectively still fell short of EU-wide targets for RP1 by a small margin, the Performance Review Body (PRB) concluded that States had made a major collective effort to close the gap in terms of capacity and cost-efficiency and that this would result in savings of some €2.4 billion over RP1 compared to the 2009 unit rate baseline. The PRB also concluded that the Network Management function was making an adequate contribution to the EU-wide targets. However, in terms of the development of Functional Airspace Blocks (FABs), only two out of nine had been fully established in advance of the December 2012 deadline. In November 2012, the European Commission said that there was little evidence of FABs contributing towards an integrated and defragmented airspace and warned that Europe was still a long way from creating a single airspace. In 2013, the Commission will present proposals to make sure the nine FABs deliver real operational improvements.

In 2012, a 2nd edition of the European ATM Master Plan was issued and further developments were made in determining the set up sequence for the SESAR Deployment Phase due to start in 2015. Guidance material has been issued on how common projects should be set up, governed and implemented.

2012 saw many ATM technical developments including the world's first four dimensional optimised flight and several pioneering operational projects providing safety improvements to airport approach control and landing. There was also significant progress towards the development of a Roadmap to achieve the safe integration of Remote Piloted Aircraft Systems (RPAS) into civil airspace.

6.2 SES II Performance Scheme

During 2012, the work of the Performance Review Body (PRB) of the Single European Sky (SES) fell into three main areas in relation to the SES II Performance Scheme:

- Assessment of revised National/FAB Performance Targets for RP1
- Assessment of Network Manager Performance
- SES Performance Scheme for RP2 and Beyond

RP1 refers to Reference Period 1 and covers three years from 2012 to 2014. RP2 covers the five year period 2015 to 2020. These three areas are now discussed in turn in the following sub-sections.

6.2.1 Assessment of revised National/FAB Targets for RP1

In April 2012, the PRB issued its report[60] assessing the revised performance plans submitted by States in response to the Commission's Recommendation of November 2011[61] which had asked certain States to revise some of their targets in order to improve efforts towards meeting the EU-wide targets.

The PRB report is structured in two volumes: Volume I contains the PRB's overall assessment of the revised Performance Plans and associated targets, as well as PRB's recommendations. Volume II contains PRB's individual assessments in respect of each revised Performance Plan. Some of the key points from the report were as follows:

- States had made a major collective effort to close the gap with the capacity and cost-efficiency EU-wide targets. However, the revised Performance Plans collectively still fell short of the EU-wide targets for RP1 by a small margin: 0.17min/flight in capacity in 2014 and 1% in determined unit rate in cost-efficiency over RP1.
- The aggregated traffic forecast from the revised Performance Plans was close to the figures used for the EU-wide performance targets, but that the latest STATFOR traffic forecast (February 2012) was forecasting a growth of 12.1% over 2009-2014, significantly below States' forecasts (-4.7%) but remaining within the bounds of the alert thresholds (10%). Such change in traffic levels would make it easier to reach the EU-wide capacity target. The reduced traffic implied an EU-wide delay performance of 0.32 min/flight in 2014, i.e. below the EU-wide target for RP1.
- Regarding cost efficiency, the revised Performance Plans collectively were close to the EU-wide targets and only fell short by 1% over RP1 (-0.3% in 2012, 1.4% in 2013 and 1.7% in 2014).
- The revised Performance Plans collectively represented a significant improvement over initial plans and would result in savings of some €2.4 billion over RP1 compared to the 2009 unit rate baseline.
- Moreover, if the revised traffic forecast materialised, application of the risk sharing mechanism of the Charging regime would result in revenues for 2014 being €143M lower than in the revised Performance Plans. Under the new Charging regime, this revenue would be lost and could not be recovered through subsequent adjustment to the unit rate, thereby delivering savings to airspace users compared to the higher charges that would have been incurred under the previous scheme based on full cost-recovery. The Scheme would therefore create strong incentives on ANSPs to manage their costs in response to the forecast traffic downturn, while mitigating the full impact through the traffic risk-sharing mechanism.
- Overall, savings in delays between the initial and the revised performance plans were expected to compensate for any increase in unit rates by a considerable margin.

The PRB recommended that the Commission accept the revised Performance Plans, subject to the detailed recommendations within the report and that the focus now should be on delivery of the Plans supported by regular and robust monitoring of performance by NSAs and the PRB.

[60] SES II Performance Scheme; assessment of revised national/FAB performance targets 1st reference period: 2012-2014, PRB, 27 April 2012

[61] Commission Recommendation of 23 November 2011 on the revision of targets established contained in performance plans under Commission Regulation (EU) No 691/2010.

6.2.2 Assessment of Network Manager Performance

The Network Manager (NM) is a key component of the SES. NM is the EC tool to implement SES in a pan-European dimension and deliver performance in partnership with all operational stakeholders. The applicable EC regulation is the ATM Network function Regulation EC 677/2011[62], dated 7 July 2011.

Eurocontrol, through its Directorate Network Management has been designated to execute NM functions as per scope, role, responsibilities, obligations, working arrangements, oversight arrangements defined in the regulation. In practice, the NM has a very wide European geographical scope of operation, applying to EU Member States, Eurocontrol States and third parties with bilateral agreements with NM.

The Network Manager Performance Plan (NMPP), which is required under EC regulation, covers RP1 and addresses the contribution of NM in the four Key Performance Areas (KPAs): safety, capacity, environment/flight efficiency and cost effectiveness. The NMPP was received by the PRB on 24 May 2012. The NMPP consists of two parts, covering firstly NM performance targets and related information in accordance with regulations 691/2010 and 677/2011, which are of a binding nature and secondly a number of objectives, actions and tasks describing the direct contribution of the NM to Network performance, which is of indicative nature.

In its assessment of the NMPP[63], the PRB concluded that the NM was making an adequate contribution to EU-wide targets and that the plan was compliant with requirements, subject to a number of minor changes and additions. Following integration of these elements, an updated version of the NMPP was incorporated into a revised version of the Network Strategy Plan (NSP)[64] issued in November 2012.

6.2.3 SES Performance Scheme for RP2 and Beyond

In March 2012, the PRB issued a consultation document[65] setting out its proposed regulatory approach for a revision of the SES Performance Scheme addressing RP2 and beyond. In this document, the PRB stated that the revision of the performance scheme in RP2 was driven by the following needs:

- To improve and reinforce the existing performance scheme by building on lessons learnt and taking account of stakeholders' feedback collected through an informal consultation phase in 2011.
- To ensure greater consistency and convergence between the performance scheme and other SES tools, such as the charging scheme, the Functional Airspace Blocks and the deployment of SESAR technology, as well as with other EU policies, such as the "Better Airports" package.
- As foreseen in Commission Regulation (EU) 691/2010, to extend the performance scheme to cover the full gate-to-gate scope, with target-setting in all four Key Performance Areas KPA.

In formulating their proposals, the general principles applied by the PRB were to

- build on existing provisions and keep stability of the performance scheme wherever possible;
- complement target setting as necessary based on tested indicators;

[62] Commission Regulation (EU) 677/2011 of 7 July 2011 laying down detailed rules for the implementation of air traffic management (ATM) network functions and amending Regulation (EU) 691/2010

[63] Report of Performance Plans for RP1 – Network Manager, PRB, 4 July 2012

[64] Network Strategy Plan 2012 to 2019, Eurocontrol, Edition November 2012

[65] Proposed regulatory approach for a revision of the SES Performance Scheme addressing RP2 and beyond, PRB, 01 March 2012

- identify new indicators as required to assist in consistency assessments and prepare the ground for future evolutions; and define related reporting requirements.

In July 2012, following a three month period of external consultation, the PRB issued a second document[66] which contained their advice to the European Commission on how the SES Performance Scheme should be developed for RP2. Table 6.1, from that document, provides an overview of that advice and summarises the proposals for RP2 in each of the four KPAs. The existing regime under RP1 is also shown for reference.

[66] Report on the preparation of the revision of the SES Performance Scheme addressing RP2 and beyond, PRB, 17 July 2012

Table 6.1: Overview of PRB advice to the Commission on the SES Performance Scheme for RP2

KPA	ANS performance indicators	RP1	RP2	Comments
Safety	Effectiveness of safety management ('maturity')	Monitoring	EU target FAB targets	Possible update of elements of the SPI
	Application of severity classification scheme	Monitoring	EU target FAB targets	Possible update of elements of the SPI
	Separation infringements	Monitoring	Monitoring	
	Runway incursions	Monitoring	Monitoring	
	ATM specific technical events	Monitoring	Monitoring	
	Application of Just Culture	Monitoring	EU target FAB targets	Possible update of elements of the SPI
	Level of reporting		Monitoring	Quality check possible in RP1
	Quality of reports and analysis		Monitoring	Quality check possible in RP1
	Effectiveness of mitigation measures		Monitoring	
Environment	Horizontal flight efficiency	EU target		EU target based on Flight plan; NM accountable
			EU target FAB targets NM target	EU & FAB targets based on actual trajectory NM target based on Flight plan
	Effective use of civil/military airspace structures	Monitoring		Based on annual reporting
			Monitoring	based on detailed on-line data
	Additional time in taxi-out phase		Monitoring	For all Performance Scheme airports
	Additional time in arrival sequencing and metering area (ASMA)		Monitoring	For all Performance Scheme airports
	Horizontal and vertical terminal performance indicator		Develop and monitor	Based on 30 second interval position report data for all Performance Scheme airports
Capacity	En-route ATFM delay	EU target Nat/FAB targets		
			EU target FAB targets	EU target includes a weather delay allowance managed at network level FAB targets are on capacity related delay
	Airport ATFM delays	Monitoring	State target	Target incorporates severe weather and exceptional events
	ATFM slot adherence		Monitoring	For all Performance Scheme airports
	ANS related local delay at the gate		Monitoring	For all Performance Scheme airports, based on A-CDM data where available
	Additional time in taxi-out phase	Monitoring		Moved to Environment KPA in RP2
	Additional time in arrival sequencing and metering area (ASMA)	Monitoring		Moved to Environment KPA in RP2
Cost-efficiency	Determined Unit Rate for en-route-ANS	EU target Nat/FAB targets	EU target Charging Zone targets	With incentives
	Terminal unit rate	Monitoring		
	Terminal determined unit rate		Monitoring	
			Terminal Charging Zone targets	With adapted consistency criteria and traffic risk sharing
	Terminal costs	Monitoring		
	Terminal ANS Determined Costs		Monitoring	

Source: PRB

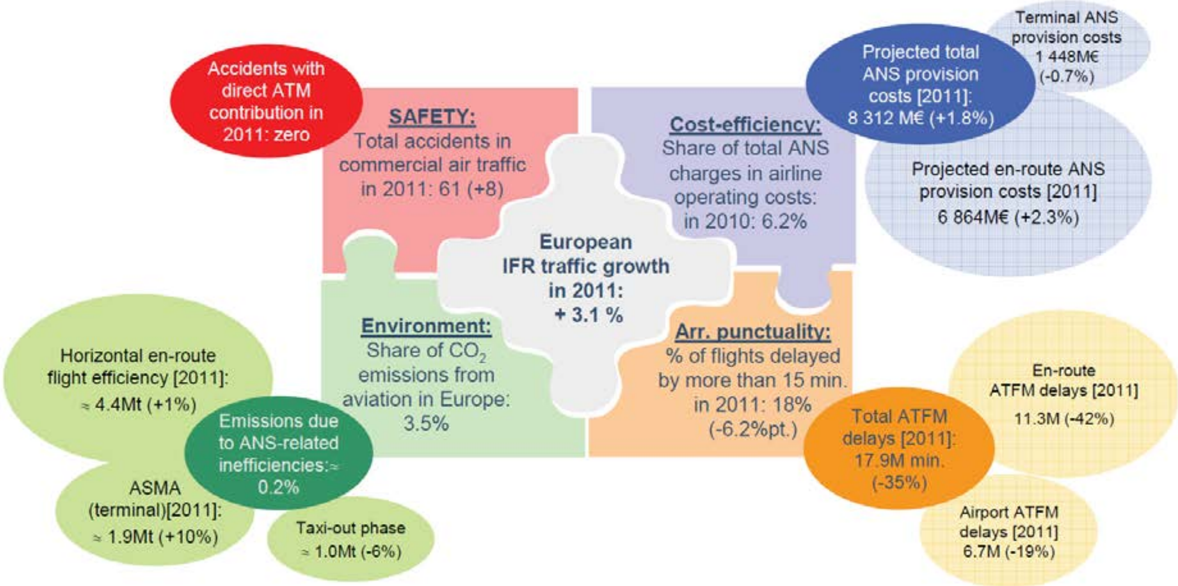
Following issue of this advice document from the PRB, the proposals have been further discussed within the Single Sky Committee (SSC). Proposed amendments to the Performance and Charging regulations were agreed at the SSC meeting in March 2013 and will now go forward to formal amendment through the Comitology process. During the remainder of 2013 and 2014, EU-wide targets for RP2 in each of the four KPAs will be adopted together with State performance plans and national targets to achieve them, in anticipation of RP2 start in 2015.

6.3 ATM Cost Effectiveness

6.3.1 Performance Review Report

Eurocontrol, through the Performance Review Commission (PRC), continues to publish ATM performance reports for a wider European geographical area covering 38 Eurocontrol Member States. The report covering ATM performance in 2011[67] was published in May 2012. The report addresses the key performance areas of the SES performance scheme and includes charges (cost-efficiency), ATFM delays (capacity) and flight efficiency (environment), with an overriding safety objective (safety). Figure 6.1 highlights the ATM performance outcomes for 2011 for each KPA.

Figure 6.1: ATM performance in 2011



Source: Eurocontrol PRC

In 2011, total air navigation charges accounted for 6.2% of airlines' total operating costs in Europe and in this chapter of Annual Analyses we concentrate mainly on ATM cost-effectiveness. Safety, delays and environment are covered in other chapters of Annual Analyses, but the 2011 highlights in these other KPAs were as follows

[67] An assessment of Air Traffic Management in Europe during the Calendar Year 2011, PRR 2011, Eurocontrol Performance Review Commission, May 2012

Safety

Safety is the primary objective of Air Navigation Services (ANS). There was no accident with direct ATM contribution in commercial aviation in Europe in 2011.

Capacity/Delays

Arrival punctuality improved significantly in 2011 (-6.2% pt.) reaching a level similar to 2009 with subsequent positive effects on the European network. ANS contributed through a substantial reduction in total ATFM delays (-35%), mainly driven by a reduction of en-route Air Traffic Flow Management (ATFM) delays (-42%) in 2011.

Environment/Flight efficiency

Emissions from aviation account for approximately 3.5% of total CO_2 emissions in Europe of which approximately 0.2% is due to ANS-related inefficiencies. ANS-related inefficiencies in the gate-to-gate phase increased in 2011, mainly due to the increase in Arrival Sequencing and Metering Area (ASMA) additional time.

6.3.2 En Route Cost Effectiveness

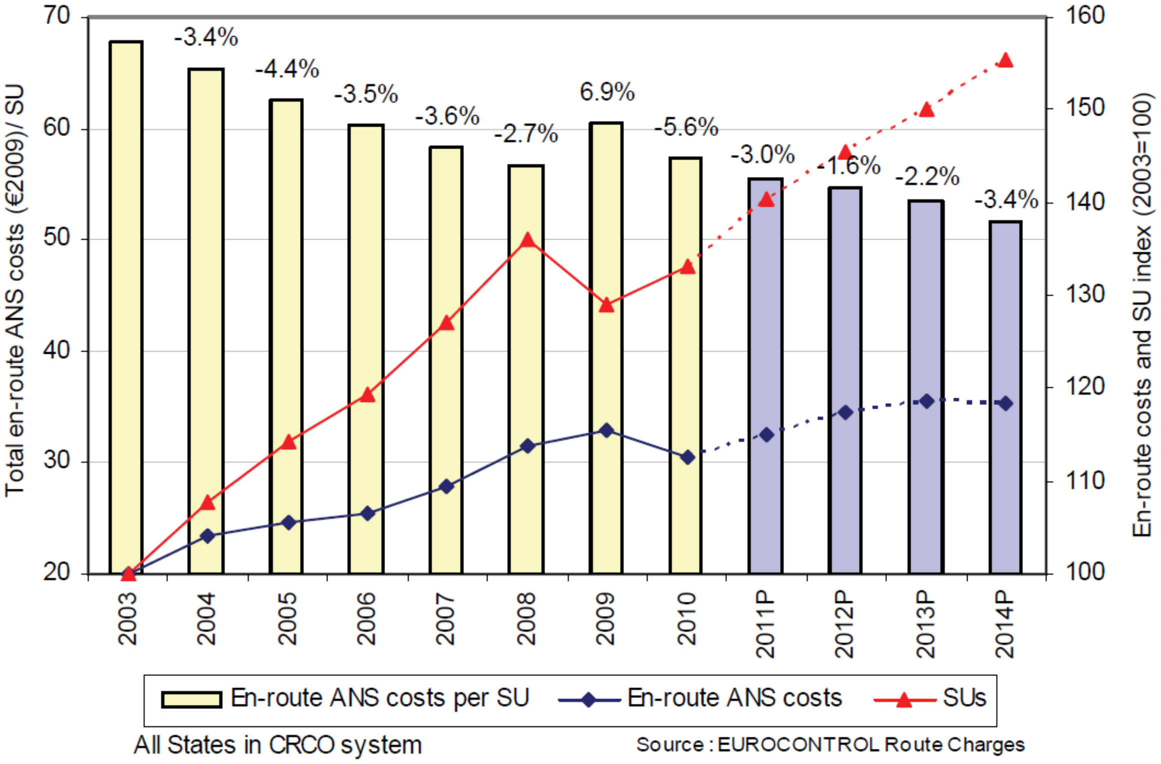
After a sharp increase in 2009 (+6.9%) reflecting the impact of the traffic downturn, en-route unit costs significantly decreased by -5.6% in 2010. This is due to the fact that while the total number of SU increased by +3.3%, en-route cost-bases reduced by -2.5%.

In April 2009, several European ANSPs stated that they would implement cost-containment measures from 2009 onwards. For a majority of States, 2010 actual en-route costs are lower than the plans made in November 2008. This indicates that the cost-containment measures implemented by the States/ANSPs generated genuine cost-savings in 2010. The efforts made in 2010 to reduce en-route costs compared to the plans (-7.0% which is equivalent to €430M) led to the reduction of the total en-route cost base observed for the Eurocontrol area (-2.5% in real terms compared to 2009).

After the significant decrease in 2010 (-5.6%), en-route unit costs per SU are planned to further reduce until 2014 to reach €51.7 for the Eurocontrol area. This represents on average a -3.1% annual en-route unit costs decrease compared to the peak of 2009 (€60.6) - Figure 6.2 below.

The EU-wide Determined Unit Rate is planned to reduce by -3.0% p.a. between 2009 and 2014. Undoubtedly, the collective effort made in 2011 by the ANS industry to prepare for the implementation of the first RP has generated an effective drive towards a better management of cost-efficiency performance despite a deteriorating business environment.

Figure 6.2: Anticipated Evolution of European En Route ANS Costs and Service Unit (SU) Charges



Source: Eurocontrol PRR (CRCO = Central Route Charges Office)

6.3.3 Airport (Terminal) Charges and Costs

The PRC has the remit to monitor terminal ANS cost-efficiency performance. In the context of the SES Performance Scheme, this remit has been strengthened as of RP1 (2012-2014). Terminal ANS cost-efficiency can for the time being only be monitored for the EU27 States plus Norway and Switzerland as no comparable data is available for the other Eurocontrol Member States.

Terminal ANS costs and charges data availability and consistency across the EU27+2 States is gradually improving. The total 2010 terminal ANS costs were reported by 26 States in November 2011. Out of the 26 States, 21 States consistently reported the data for the period 2009-2014. These 21 States (23 terminal charging zones) represent an amount of around €1,416M and cover 211 airports.

For the first time the PRC recomputed the terminal TSU series with a common exponent (MTOW[68]/50)$^{0.7}$ which will be mandatory by 2015 for the EU27+2 States. This enables direct comparison of terminal ANS

[68] MTOW = Maximum Take Off Weight

unit costs across States and across time in line with the performance indicators specified in the Performance Scheme Regulation.

In 2010, terminal ANS unit costs decreased at a slightly higher pace than en-route ANS unit costs (-7.0% for terminal and -5.6% for en-route).

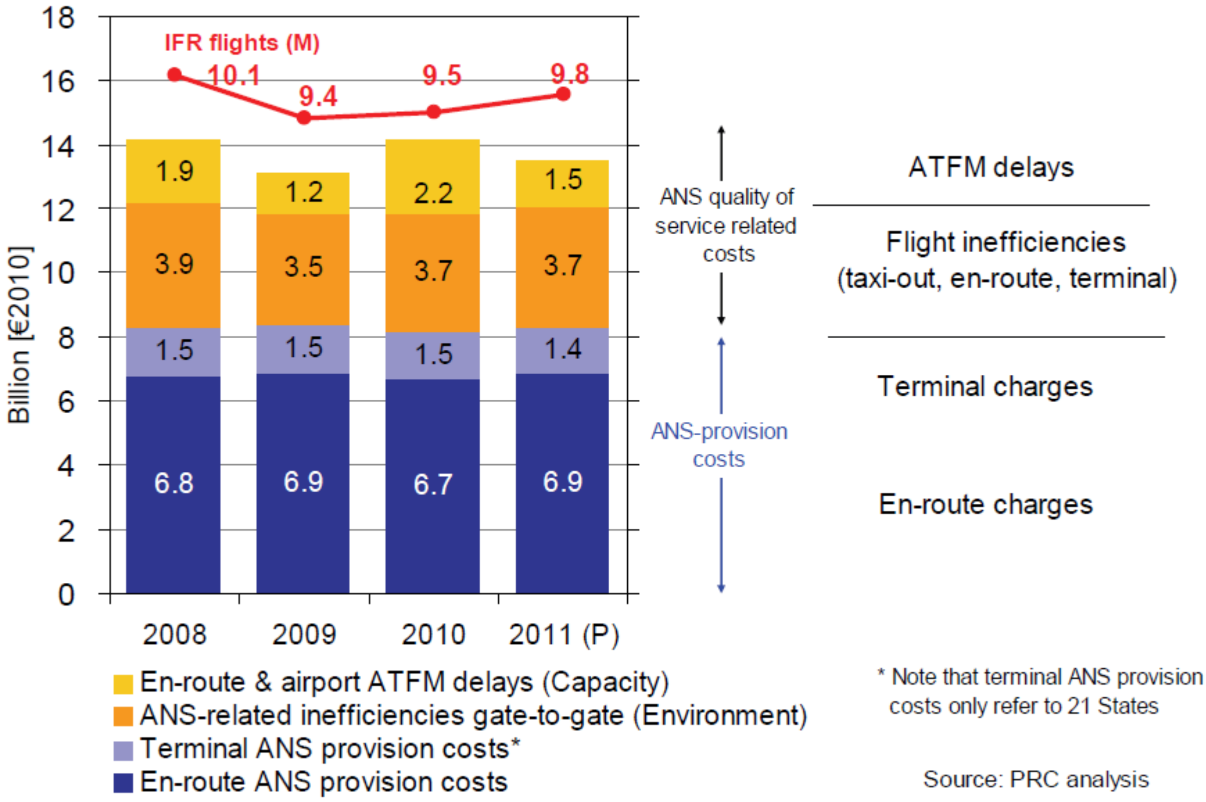
In 2010 total terminal ANS costs amounted to €1 416M, a decrease of -5.0% in real terms over 2009 (€1 490M). The Terminal ANS costs are predicted to further decrease, albeit at a lower rate, between 2010 and 2014 (-0.8% p.a. on average).

6.3.4 Economic Impacts of ATM Performance

The economic evaluation of ANS performance combines the en-route and terminal ANS provision costs (cost efficiency) with the estimated costs to airspace users due to ANS-related inefficiencies (Capacity/ Environment).

Overall, unit costs decreased notably in 2011, as a result of a decrease in total ANS-related economic costs (-4.3%) and a traffic growth of 3.1%. The reduction resulted from a substantial improvement in ANS service quality compared to 2010 and thus from a reduction of ANS-related service quality costs of -13% which compensated for the increase in ANS provision costs (+1.8%).

Figure 6.3: Estimated ANS-related economic costs to airspace users (gate-to-gate)



Source: Eurocontrol PRC

Safety being monitored separately, an overall economic evaluation provides a consolidated high-level view to assess the effectiveness of policy objectives at system level and to promote an initial discussion on future ANS performance objectives.

6.3.5 En Route Unit Rates 2012

Table 6.2 shows an analysis of the yearly evolution of en route traffic handled by Air Navigation Service Providers in Europe and the overall average unit rate charged. Traffic is measured in Total Service Units which include an aircraft weight factor and take account of the distance travelled. The States included within Europe are those covered by the SES Performance Scheme[69]. Data for 2008 to 2012 are actuals based on data from the Central Route Charges Office (CRCO), while 2013 is based on the latest forecast from Eurocontrol STATFOR[70]. The unit rate at the European level for each year was determined as the average estimated unit rates for each Member State in euros (€) weighted by the number of service units handled by each State. Unit rates are nominal, i.e. as charged each year.

Table 6.2: Evolution of Traffic & En Route Unit Rates at the European level

Year	Traffic (TSUs)	YoY Growth	Average Unit Rate (Nominal €)	YoY Growth
2008	103,587,964		59.73	
2009	96,828,680	– 6.5%	60.83	1.8%
2010	99,317,925	2.6%	62.33	2.5%
2011	103,719,612	4.4%	63.08	1.2%
2012	102,140,359	– 1.5%	62.47	– 1.0%
2013F	101,322,438	-0.8%	63.10	1.0%
2008 to 2013F		– 2.2%		5.6%

Source: Mott MacDonald analysis based on STATFOR and CRCO data (TSU = Total Service Unit)

Due to the continuing world economic slowdown and particularly the sovereign debt crisis within Europe, 2012 saw a decrease in traffic (measured in service units) of -1.5% in 2012 over 2011, and in 2013, a further period of traffic decline is anticipated of -0.8%. In 2012, average unit rates decreased by -1.0% on top of the -1.5% decrease in traffic, indicating an overall improvement in en route ATM cost effectiveness. However, in 2013, this trend is expected to be reversed. Although traffic is forecast to fall by -0.8% in 2013, this is matched by a corresponding increase in average charges of +1.0%. Note that this anticipated increase in charges includes inflation, and in real terms average charges are expected to again fall in 2013.

In terms of the longer term trend, looking at the six year period between 2008 and 2013, traffic is expected to have declined by - 2.2% in total (due to the economic downturn) while charges, nominally, will have risen by 5.6%. As a crude measure this represents a decline in en route ATM cost effectiveness in nominal terms but still represents an improvement in real terms, if inflation is taken into account. Further gains in en route ATM cost effectiveness are anticipated in the remainder of RP1 and RP2 as a result of the SES Performance Scheme, and in particular the incentives to reduce costs available to ANSPs through the charging regulation[71].

[69] EU27 + Norway and Switzerland. Note that Estonia and Latvia were not included in this analysis because full historic data was not available for these States.

[70] Eurocontrol Seven-Year Forecast – Flight Movements and Service Units 2013 to 2019, Eurocontrol STATFOR, February 2013

[71] Commission Regulation (EC) No 1794/2006 of 6 December 2006 laying down a common charging scheme for air navigation

Table 6.3 shows the same analysis for 2012 and 2013 at the SES State and FIR (Flight Information Region) level. The table shows actual growth in traffic (TSUs) in 2012 over 2011 and forecast growth for 2013 over 2012. The percentage changes in unit rates for these periods are also shown. In 2012 the percentage change in unit rates is shown expressed in € (i.e. how they are billed) and in local currency (i.e. how they are determined). Entries are arranged in 2013 unit rate reduction order in relation to traffic growth, starting with the greatest reduction. So for example, Belgium-Luxembourg FIR is set to reduce its charges by -7.8% in 2013. This comes on top of a forecast decrease in traffic of -1.4% which with all else being equal, might be expected to stimulate an increase of 1.4% in charges. Thus, as a crude measure, a -7.8% decrease in nominal charges plus a -1.4% decrease in traffic represents a net improvement of 9.2% in en route ATM cost effectiveness.

Table 6.3: Actual/Forecast Growth in Traffic & Unit Rates for 2012 and 2013

State (and FIR)		Growth 2012/2011		Growth 2013F/2012	
	Traffics	Unit Rates	Unit Rates	Traffic	Unit Rates
	(TSUs)	€	Local Currency	(TSUs)	€
Belgium-Luxembourg	0.9%	-3.5%	-3.5%	-1.4%	-7.8%
Norway	7.8%	-4.4%	-8.1%	1.7%	-9%
Ireland	0.9%	-8.9%	-8.9%	-0.4%	-5.8%
Slovenia	0.1%	-3.5%	-3.5%	-0.3%	-5.9%
Switzerland	-2.3%	9.1%	0.0%	-2.9%	-2%
Finland	-5.1%	24.3%	24.2%	-4.5%	-0.4%
Greece	-4.2%	-5.9%	-5.9%	-0.3%	-4.2%
Spain-Continental	-7.2%	-7.7%	-7.7%	-4.3%	0.2%
Romania	1.2%	-5.6%	-5.2%	2.3%	-5.2%
Lithuania	2.3%	-4.2%	-4.2%	-0.6%	-2.2%
Hungary	-2.1%	9.4%	10.6%	1.2%	-3.8%
Austria	-2.0%	1.2%	1.2%	-2.1%	0.5%
Spain-Canaries	-4.0%	-7.4%	-7.4%	-1.5%	0.2%
Italy	-2.8%	11.6%	11.7%	-1.5%	0.5%
Czech Republic	0.0%	-0.1%	-0.5%	0.4%	-0.8%
France	-1.0%	-3.6%	-3.7%	-0.7%	0.4%
Latvia	0.7%	0.0%	0.0%	0.5%	-0.8%
Netherlands	-0.3%	-0.1%	-0.1%	0.1%	-0.1%
Denmark	-2.8%	5.5%	5.5%	-2.1%	2.8%
Germany	-1.8%	3.3%	3.3%	-1.9%	3.3%
Bulgaria	0.1%	-8.1%	-8.1%	3.0%	0.2%
Cyprus	-3.3%	6.5%	6.4%	2.9%	0.6%
Poland	4.8%	-8.8%	0.2%	1.9%	1.8%
Slovak Republic	2.4%	12.9%	12.8%	4.2%	0.2%
Sweden	-1.8%	5.3%	4.3%	-1.1%	6.5%
Portugal - Lisbon	-1.4%	-30.6%	-30.5%	0.1%	5.3%

services

State (and FIR)			Growth 2012/2011		Growth 2013F/2012
United Kingdom	-2.6%	1.2%	4.9%	-1.2%	9.3%
Malta	26.8%	33.6%	33.3%	9.2%	14.2%

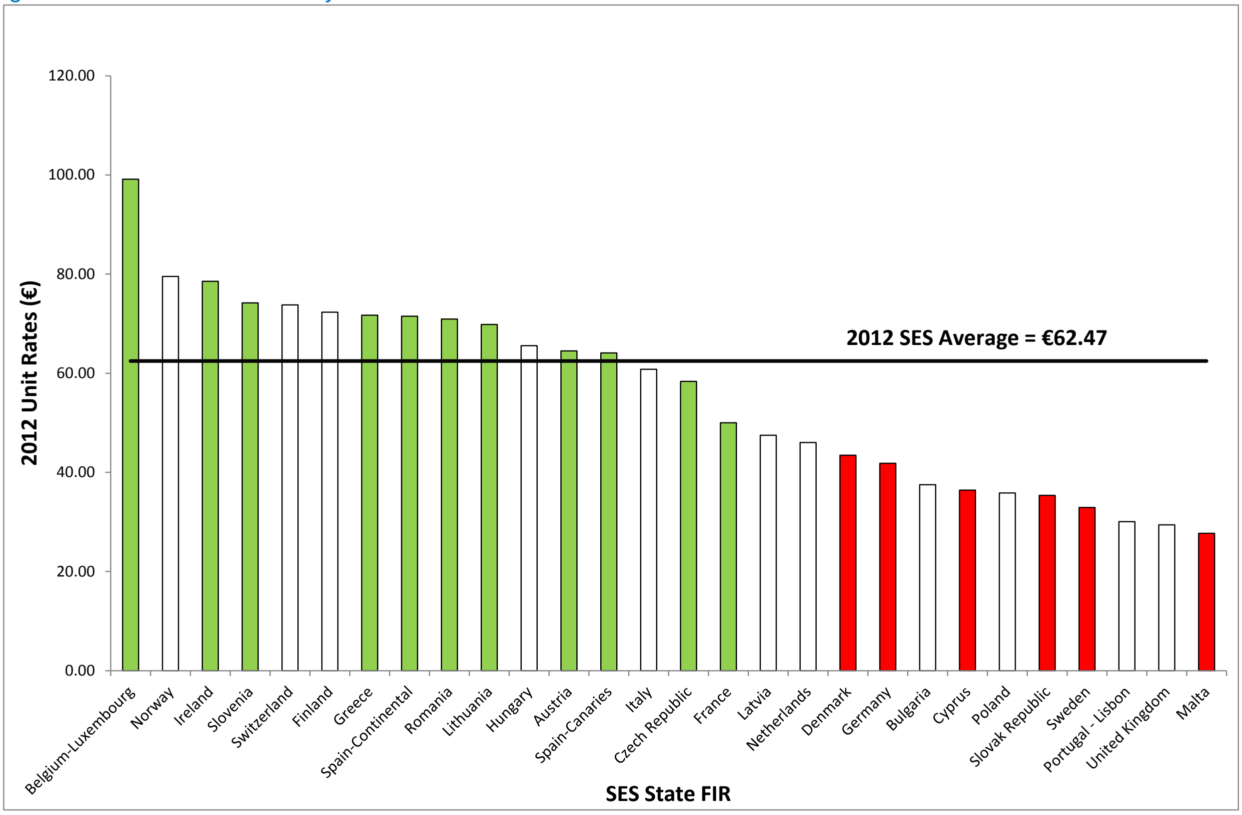
Source: Mott MacDonald analysis based on STATFOR and CRCO data (TSU = Total Service Unit, FIR = Flight Information Region), Green entries indicate two years of improvement in ATM cost effectiveness; Red entries indicate two years of decline

In terms of the nominal unit rate, 15 State FIRs reduced their en route charges in 2012 compared to 2011; and 13 FIRs in 2013 compared to 2012. 10 State FIRs reduced their rates in both years. When traffic levels are taken into account, 16 State FIRs improved their en route ATM cost effectiveness in 2012 and 18 FIRs are expected to improve in 2013, with 11 FIRs expected to improve in both years – these are Belgium-Luxembourg, Ireland, Slovenia, Greece, Spain (Continental), Romania, Lithuania, Austria, Spain (Canaries), Czech Republic and France. These States are highlighted in green in Table 6.3. By contrast, 6 State FIRs (highlighted in red in the table) are expected to show net decreases in en route ATM cost effectiveness in both years. These are Denmark, Germany, Cyprus, Slovak Republic, Sweden and Malta. Two States, Poland and the United Kingdom, just escape this categorisation, because of favourable exchange rate changes which meant that the change in the unit rates billed in Euros in 2012 over 2011 was significantly better than the change expressed in local currency.

It should be note that this analysis is based only on a crude measure of ATM cost-effectiveness. The analysis presented takes no account of differences in airspace complexity between FIRs, impacts of inflation, past efficiency gains or disparities in existing unit rates that may need to be addressed. For example, Figure 6.4 shows that the majority of SES State FIRs that are anticipated to improve their cost-effectiveness in both 2012 and 2013 (highlighted in green) had higher unit rates in 2012 than the SES average, while those that are reducing their cost-effectiveness in 2012 and 2013 (highlighted in red) had lower unit rates than the average in 2012.

The important message from the foregoing analysis is that the SES performance scheme does appear to be driving unit rates at the State level in the right direction i.e. towards the average, and that this average is also declining slowly in real terms.

Figure 6.4: 2012 Unit Rates by SES State FIR



Source: Mott MacDonald Analysis based on CRCO data

6.3.6 Global Benchmarks

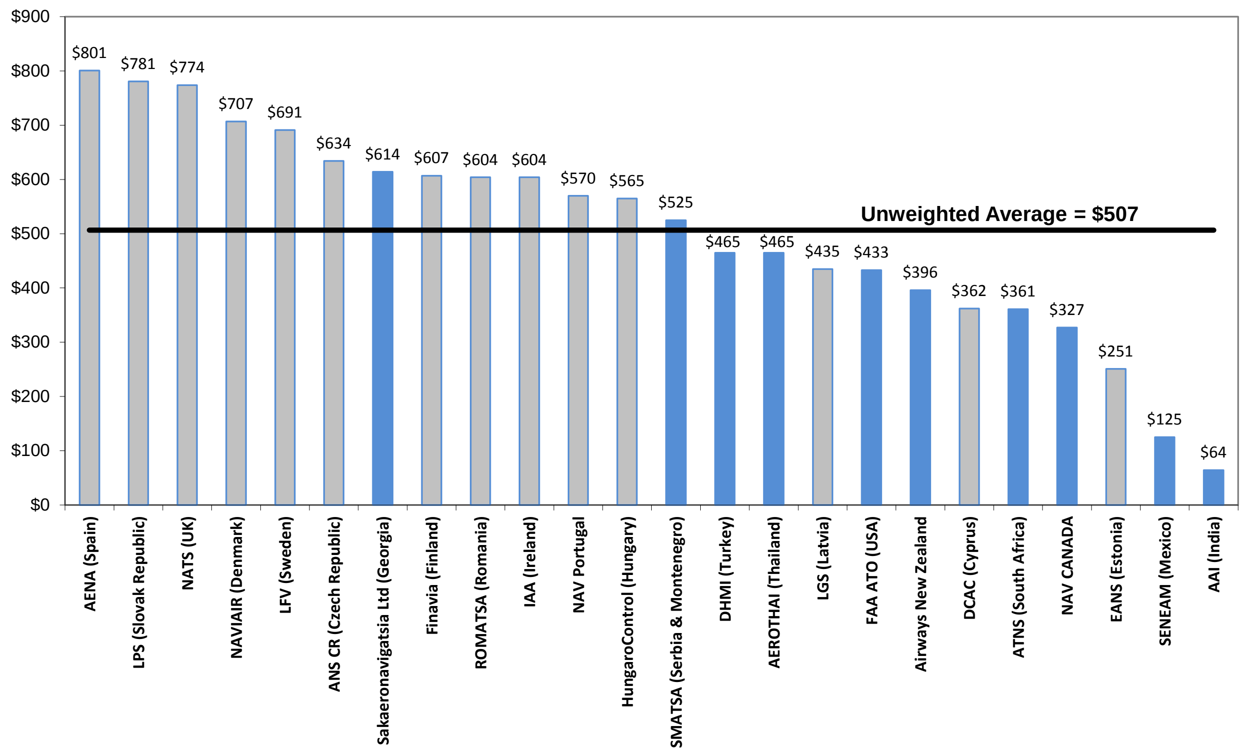
In January 2013, the Civil Air Navigation Services Organisation (CANSO) published its third public release of global air navigation service (ANS) performance, covering the period 2007 to 2011[72]. This included performance data related to productivity, cost effectiveness, price, revenue and profitability for 26 Air Navigation Service Providers (ANSPs) around the world.

In the CANSO report, ATM cost effectiveness is measured in terms of the total costs per IFR[73] Flight Hour handled. The report details results for both continental and oceanic airspace but only the results for continental airspace are reproduced here. Figure 6.5 shows a comparison of 24 ANSPs that provided 2011 data on costs. For comparison reasons, the data is shown in 2011 U.S. Dollars. The simple un-weighted average of $507 for the 24 ANSPs supplying data is also shown and EU ANSPs are shown in grey.

[72] Global Air Navigation Services Performance Report 2012, 2007-2011 ANSP Performance Results, CANSO, January 2013

[73] IFR = Instrument Flight Rules. In this context it refers to all flight-planned flights in controlled airspace

Figure 6.5: Cost per IFR Flight Hour (Continental Airspace) by ANSP - 2011 US Dollars



Source: CANSO 2012 report on Global ANS Performance. EU ANSPs shown in grey

Figure 6.5 highlights the higher than average costs of most European ANSPs in the data sample.

Table 6.4 shows comparative cost effectiveness data in (constant 2007) U.S. Dollars for 20 ANSPs for the period 2007 to 2011. The table is arranged in descending order of average annual growth (AAGR) in cost over the period. EU ANSPs that provided data are again highlighted in grey. The average annual cost increase over the period for all ANSPs in the sample was 3.5%. Whilst the costs of some European ANSPs in this sample have shown above average increases in this period, others have been below average or have shown decreases. This provides some encouragement that European ATM cost effectiveness is improving, meaning that over time fewer European ANSPs will be above the global average in terms of costs and therefore charges. It should be noted that 2011 data from LVNL (Netherlands) and DFS (Germany) was not provided.

Table 6.4: Total Costs (USD 2007) per IFR Flight Hour (Continental Airspace) by ANSP

ANSP	2007	2008	2009	2010	2011	AAGR
HungaroControl (Hungary)	412	491	611	756	791	17.7%
ATNS (South Africa)	263	282	307	369	434	13.3%
SMATSA (Serbia & Montenegro)	581	563	625	710	794	8.1%
LFV (Sweden)	551	542	676	751	744	7.8%
FAA ATO (USA)	336	363	403	425	433	6.5%
SENEAM (Mexico)	97	108	126	123	125	6.5%
IAA (Ireland)	542	573	607	647	687	6.1%

ANSP	2007	2008	2009	2010	2011	AAGR
LPS (Slovak Republic)	706	741	893	872	888	5.9%
NAVIAIR (Denmark)	639	725	805	769	802	5.8%
EANS (Estonia)	228	262	277	294	285	5.7%
NATS (UK)	806	739	867	892	1000	5.5%
Airways New Zealand	323	325	357	378	396	5.2%
LGS (Latvia)	431	452	498	569	501	3.8%
ROMATSA (Romania)	781	882	905	811	824	1.3%
NAV CANADA	358	344	344	352	340	-1.3%
ANS CR (Czech Republic)	743	718	732	735	697	-1.6%
NAV Portugal	730	780	763	660	648	-2.9%
AENA (Spain)	1117	1178	1291	972	910	-5.0%
Finavia (Finland)			776	738	691	-5.6%
Sakaeronavigatsia Ltd (Georgia)	792	849	455	454	615	-6.1%
Unweighted Average	**549**	**575**	**616**	**614**	**630**	**3.5%**

Source: CANSO 2012 report on Global ANS Performance (EU ANSPs highlighted in grey)

Another interesting set of data from the CANSO report shows the evolution of employment costs over the period 2006 to 2010 for operational Air Traffic Control Officers (ATCOs). This data is shown in Table 6.5 and is depicted in decreasing order of 2010 employment costs per IFR Flight Hour provided. The data is for total costs of employment so will include overheads as well as ATCO salaries.

EU ANSPs are highlighted in grey; and again they feature heavily in the top half of the table, in part reflecting the higher cost of living and therefore cost of employment in the more mature economies of the European Union. Although in 2011 AENA was still the highest in terms of employment costs per IFR Flight Hour, these have been reduced significantly since 2008 following actions instigated by AENA both in response to pressure from airlines and in anticipation of potential privatisation.

In terms of trends in employment costs, the picture is slightly more favourable for the EU ANSPs compared to the non-EU ANSPs in the sample. For the EU ANSPs, about half have seen employment costs increasing at higher than the overall annual average of 3.6% but for the non-EU ANSPs in the sample, with the exception of NAV Canada, all have seen employment costs growing at above the annual average.

Table 6.5: Employment Costs (USD 2007) for ATCOs per IFR Flight Hour (Continental Airspace) by ANSP

ANSP	2007	2008	2009	2010	2011	AAGR
AENA (Spain)	657	702	736	445	391	-12.2%
LFV (Sweden)	159	202	255	261	304	17.6%
NAV Portugal	200	240	263	239	296	10.3%
NATS (UK)	194	186	241	240	243	5.8%
HungaroControl (Hungary)	114	124	150	163	239	20.3%
Finavia (Finland)			246	262	230	-3.3%
ROMATSA (Romania)	234	239	240	186	191	-4.9%
NAVIAIR (Denmark)	181	169	232	193	188	1.0%
LPS (Slovak Republic)	154	146	172	180	181	4.1%

ANSP	2007	2008	2009	2010	2011	AAGR
IAA (Ireland)	144	156	177	170	175	5.0%
ANS CR (Czech Republic)	173	145	142	153	157	-2.4%
Airways New Zealand	110	112	129	144	149	7.9%
SMATSA (Serbia & Montenegro)	109	100	112	121	135	5.5%
NAV CANADA	103	103	111	114	113	2.3%
FAA ATO (USA)	88	86	94	97	102	3.8%
ATNS (South Africa)	41	50	60	68	97	24.0%
EANS (Estonia)	51	70	70	88	85	13.6%
LGS (Latvia)	65	69	69	73	74	3.3%
Sakaeronavigatsia Ltd (Georgia)	39	49	51	47	61	11.8%
SENEAM (Mexico)	25	27	35	35	39	11.9%
Unweighted Average	**150**	**157**	**179**	**164**	**173**	**3.6%**

Source: CANSO 2012 report on Global ANS Performance (EU ANSPs highlighted in grey)

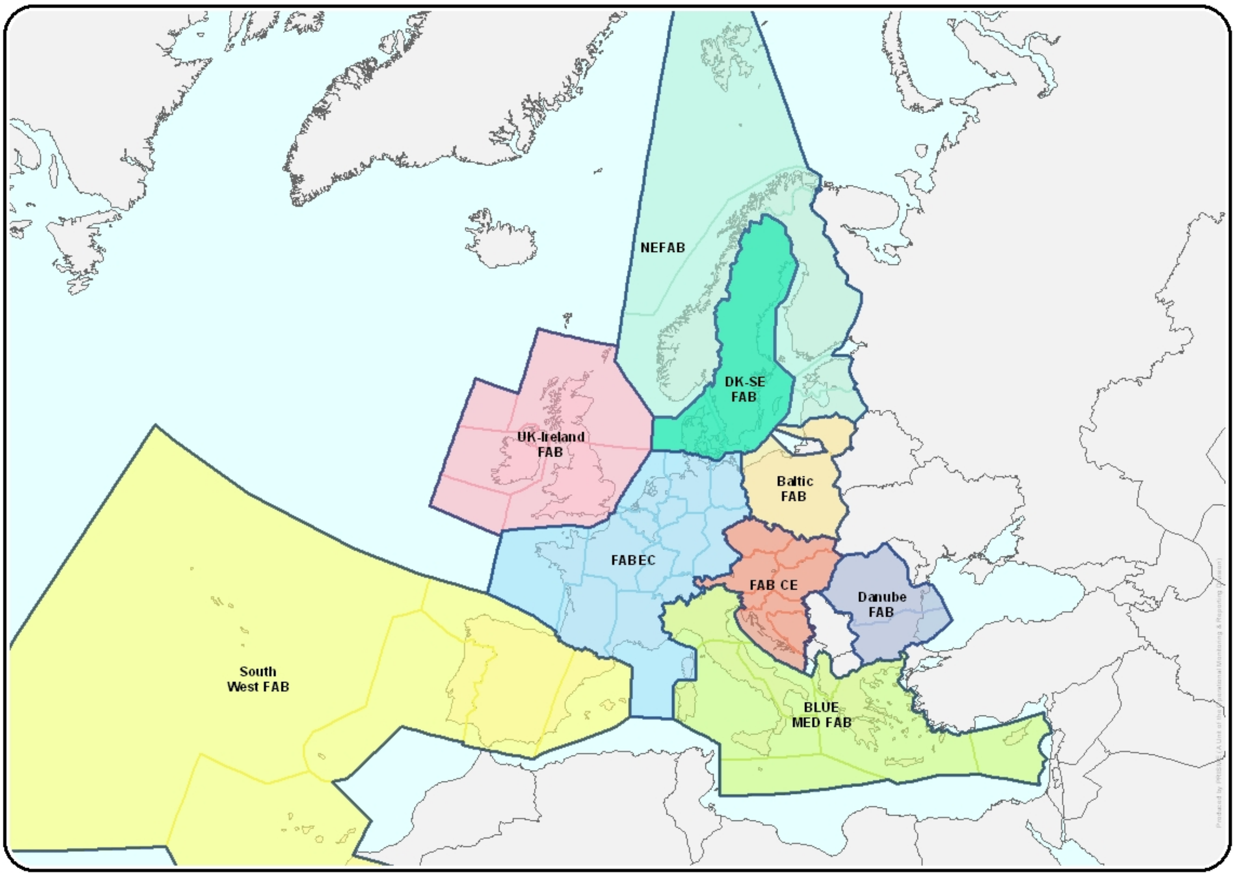
6.4 Functional Airspace Blocks (FABs)

The formation of Functional Airspace Blocks (FABs) is a cornerstone of the SES strategy. FABs are key enablers for enhanced cooperation between ANSPs in order to improve performance and create synergies. There are nine FAB initiatives in Europe (Figure 6.6). SES II Regulation 1070/2009[74] provided a timetable of December 2012 for their establishment. However, speaking at the Limassol High Level Conference on the Single European Sky in October 2012, Mr Siim Kallas, the Vice President of the European Commission in charge of Transport, warned that, based on progress to date, Europe was still a long way from creating a single airspace. He said, for example, that while the FABs are to be established, “We now need to make them add proper value. At the moment it is clear that they will make little if any contribution towards an integrated and defragmented airspace.” He announced that in order to ensure the necessary progress, the Commission will use its existing powers to the maximum, if necessary including infringements. In Spring 2013, the Commission will present proposals to make sure the nine FABs deliver real operational improvements. They will be required to develop strategic and operational plans at FAB level. It is not enough for the FABs to exist on paper; they must deliver real operational results swiftly.

The status of the 9 FAB initiatives and developments during 2012 are shown in Table 6.6.

[74] Regulation (EC) No 1070/2009 of the European Parliament and of the Council amending Regulation (EC) No 594/2004, (EC) No 550/2004, (EC) No 551/2004 and (EC) No 552/2004 in order to improve the performance and sustainability of the European Aviation System, 21st October 2009

Figure 6.6: The Nine European FAB Initiatives



Source: European Commission

Table 6.6: European FAB Initiatives – Status and Developments in 2012

FAB Initiative	Status at the end of 2012
Baltic FAB (Lithuania and Poland)	State agreement was signed in July 2012 but has not yet entered into force. The FAB safety case and a cost benefit analysis were submitted in April 2012 and reviews completed. Replies to observations made have been submitted by the FAB. Proposed co-operation agreements for the NSAs, ANSPs and Civil-Military ATM were all submitted in April 2012 and are under review. The composition of the FAB might need to be reconsidered in order to ensure compliance with the regulatory definition of a FAB.
Danish - Swedish FAB	FAB established in December 2009, with NUAC (Nordic Unified Air traffic Control) created in early 2010 as a joint subsidiary of the Danish ANSP, Naviair, and the Swedish ANSP, LFV. A fully integrated airspace was established in July 2012 and NUAC will take over the operation of the three en route centres by 2013. The FAB safety case was submitted in June 2012 and its review completed. The Commission has suggested that the FAB merges with NEFAB to be compliant with FAB regulatory definitions.
North European FAB (NEFAB) (Estonia, Finland, Latvia and Norway)	State agreement was signed in June 2012 and entered into force in December 2012. The signing of an NSA Co-operation Agreement is also foreseen at that stage. The FAB safety case was submitted in January 2012 and has been reviewed by interested parties. A reply to observations made has been submitted by the FAB. Similarly a cost-benefit analysis has been submitted. In July 2012, nine Northern European ANSPs from NEFAB, Iceland, the Danish-Swedish FAB, and FAB UK-Ireland formed the “Borealis Alliance” for strategic business co-operation including SESAR deployment.

FAB Initiative	Status at the end of 2012
FAB UK-Ireland	FAB operational since July 2008. FAB safety case submitted in April 2012 and review completed. Enhanced co-operation between National Supervisory Authorities (NSAs) has been achieved based on a substantially updated MoU in 2012. A statement of the added value of the FAB was submitted in April 2012 and its review completed with critical observations by airspace users. A reply to these and other observations has been submitted by the FAB. Inter-FAB coordination is being enhanced through the creation of the Borealis Alliance (see NEFAB).
FAB Europe Central (FABEC) (Belgium, France, Germany, Luxembourg, Netherlands, Switzerland and Eurocontrol Maastricht)	The FABEC treaty was signed in December 2010 but the agreement is not yet in force. The FABEC safety case was submitted in June 2012 and its review has been completed. Observations made are now under due consideration by the FAB. Stakeholder consultation on the cost benefit analysis was held in May 2012 but airspace users expressed their concern that it would only deliver one tenth of the benefits identified by the feasibility study. Cost benefit analysis was submitted in June 2012, its review has been completed and a reply to observations made by the FAB.
FAB Central Europe (FAB CE) (Austria, Bosnia-Herzegovina, Czech Republic, Croatia, Hungary, Slovakia and Slovenia)	State agreement was signed in May 2011 but has not yet entered into force. An updated safety case was submitted in June 2012 and its review has been completed. A reply to observations made has been submitted by the FAB. NSA, ANSP and Civil-Military ATM Co-operation agreements were submitted in April 2012, reviews completed, and replies to observations made submitted by the FAB. The cost benefit analysis was submitted in April 2012 but is in need of update. The achievement of some benefits is only foreseen by 2018. The review of the outdated version has been completed and a reply to observations made has been submitted.
Danube FAB (Bulgaria and Romania)	State agreement was signed in December 2011 but has not yet entered into force. The FAB safety case was submitted in June 2012 and its review has been completed. Observations made are now under due consideration by the FAB - similarly for the cost benefit analysis submitted in Aril 2012.
South West FAB (Portugal and Spain)	State agreement was due for signature in November 2012 but did not go ahead. A bilateral NSA agreement and an ANSP MoU were signed in May 2012. The FAB safety case and a cost benefit analysis were submitted in June 2012 and reviews completed. Replies to observations made have been submitted by the FAB.
Blue MED (Cyprus, Greece, Italy, Malta with Tunisia, Albania as associate partners and Kingdom of Jordan and Lebanon as observers)	State agreement was signed in October 2012 but has not yet entered into force. NSA, ANSP and Civil-Military ATM Co-operation agreements are in preparation but have not yet been signed. The FAB safety case was submitted in June 2012 and its review has been completed. Observations made are now under due consideration by the FAB - similarly for the cost benefit analysis.

Source: Largely based on FAB Co-ordinator's Final Progress Report on the Functional Airspace Blocks – 4 December 2012

6.5 SESAR

6.5.1 SESAR Development and Deployment Phases

The Development Phase of SESAR (Single European Sky ATM Research) is being managed by the SESAR Joint Undertaking, a partnership between the EU, Eurocontrol and industry. Some €2bn is being put into developing and validating the technology and procedures that will result in a major change in all the aspects of ATM, from how airports manage arrivals and departures, to how we ensure the safe separation of aircraft in the en route phase. The long-term aim is to move towards the concept of 4D trajectory management, with aircraft following a flight plan that is updated interactively in real time. Air traffic controllers would therefore take on much more of a monitoring role, rather than actively directing traffic.

In November 2012, Airbus and its ATM subsidiaries – Airbus ProSky, Quovadis and Metron Aviation – together with the EADS division Cassidian, were selected to participate in upcoming SESAR JU Integrated Flight Trials scheduled to commence in early 2013 and conclude by the end of 2014. Together they form part of the SESAR JU's on-going 'Atlantic Interoperability initiative to Reduce Emissions III (AIRE III) SESAR Integrated Flight Trials.' AIRE is the joint European Commission and Federal Aviation Administration (FAA) programme which aims to reduce CO2 emissions and accelerate the uptake of ATM best practices and to capitalise on today's aircraft technology. These integrated flight trials will validate technology and procedures to deliver innovative ATM solutions which will be immediately operational, and allow stakeholders to take direct advantage of the benefits. More about AIRE can be found in Chapter 8.

Of course, even once the research, development and validation stages are complete, it is still necessary to implement the improvement before the benefits can be achieved. It is estimated that this Deployment Phase will cost a total of €30bn, spread over several years and split between the air navigation service providers, airports and the aircraft operators. There may also need to be some public sector money spent to help stimulate this investment and overcome the 'last mover advantage' that has slowed deployment in the past.

In December 2011, the European Commission issued a Communication[75] on governance and incentive mechanisms for the deployment of SESAR. The Communication discussed a number of actions that the Commission would undertake to facilitate SESAR deployment.

In July 2012, the Commission, through DG MOVE, hosted a seminar in order to seek stakeholder feedback following its issue of draft guidance material on common projects for SESAR deployment[76]. The purpose of the guidance material is to:

- define common projects and how they can assist the implementation of the ATM Master plan;
- further refine the role of the stakeholders within their respective competences, identify the need for new partnerships and interactions;
- define how common projects should be set up and implemented;
- set out an incentive scheme for the implementation of common projects.

Following the seminar in July, the Commission, through DG MOVE, has pursued the following main actions with the objective of completing the set up sequence (Table 6.7) for the start of SESAR deployment by the end of 2014:

- Updating the European ATM Master Plan;
- Drafting a proposal for a Commission implementing Regulation on guidance material on common projects;
- Defining the pilot common project that will be launched so that it can be adopted as soon as possible after the entry into force of the guidance material;
- Continuing the work of the Interim Deployment Steering Group (IDSG), established in February 2012, with the immediate priority being the delivery of an Interim Deployment Programme (IDP).

[75] COM (2011) 923 final, Governance and incentive mechanisms for the deployment of SESAR, the Single European Sky's technological pillar, 22 Dec 2011

[76] Guidance material on common projects for SESAR deployment, draft discussion paper V6.03.05.2012, European Commission, July 2012

Table 6.7: Summary of the "set-up sequence" for the SESAR Deployment Phase

Instruments	Contents	Deadline (adoption or approval)
ATM Master Plan	▪ Essential operational changes	October 2012
Guidance Material	▪ Governance structure ▪ Common projects definition ▪ Incentives definition	June 2013
Pilot Common Project	▪ Selection of implementation objectives ▪ Business view, including demonstration of a positive CBA ▪ Associated safety and regulatory measures ▪ Associated incentives	As soon as possible after adoption of the guidance material, not later than end of 2013
Deployment Programme	▪ Project view of the pilot common project ▪ Specification for the implementation projects needed to deploy the pilot common project	Draft: early 2014 Final: mid 2014
Deployment Manager	▪ Industrial consortium to execute and manage the deployment programme and report to the political level	By mid 2014
Implementation Projects	▪ Contracts to implement under the coordination of the deployment manager	End 2014

Source: DG MOVE Draft Conclusions from July 2012 Seminar on Guidance material on common projects for SESAR deployment

In particular, the Commission is ensuring coherence of development and deployment processes with the SES framework and that the human factor, military and safety issues are duly addressed.

The update of the ATM Master Plan is addressed in Section 6.5.2

The guidance material has taken the form of a Commission implementing Regulation adopted on 3 May 2013[77]. As such, the Regulation is immediately applicable in all EU Member States. Through this initiative, the Commission has activated the deployment process that will close the loop of the SESAR lifecycle and allow SESAR to fully deliver its benefits from concept to implementation. This Regulation defines four main instruments to support SESAR deployment:

1. **Common projects**, which aim to deploy ATM functionalities that are considered to be essential contributors to the improvement of the Union's ATM system performance. Common projects focus on those essential functionalities identified in the ATM Master Plan that are mature for implementation and that demonstrate to have a global positive business case for the European ATM network. In particular, their purpose is to assist the successful implementation of the ATM Master plan and also of the Network centric priorities in the Network Strategy plan. In this sense, they should also serve as vehicles to channel incentives, including EU funding and potentially user charges, to support the timely

[77] Commission Implementing Regulation (EU) No 409/2013, on the definition of common projects, the establishment of governance and the identification of incentives supporting the implementation of the European Air Traffic Management Master Plan, 3 May 2013

and synchronised deployment of essential ATM operational changes.

2. **Governance mechanisms** that ensure a timely, synchronised and coordinated deployment of the SESAR concept of operations and that involves all stakeholders and the relevant EU and Single Sky bodies allocating them clear responsibilities within three levels:
   a. **At policy level**, the Commission sets up and adopts common projects, after consulting stakeholders and Member States, in the form of Commission implementing Regulations. The Commission ensures the coherence of the common projects with the SES policy and the safeguard of the public interest. It also manages the incentives granted to the implementation projects and monitors the overall implementation of the common projects and their contribution to improving ATM performance;
   b. **At management level**, the deployment manager, designated by the Commission, develops and ensures the timely and coordinated execution of the deployment programme; and
   c. **Finally**, at implementation level, project managers ensure the execution of their implementation projects in accordance with the deployment programme.

3. **The deployment programme**, which translates the common projects into detailed deployment activities; and

4. **Targeted incentives** to support the coordination and the implementation of common projects.

In August 2012, anticipating the adoption of the above mentioned Regulation, the Commission launched the setup of the first common project as a pilot exercise ("pilot" common project).

The IDSG has continued its work on coordinating the implementation of the ATM Master Plan baseline requirements that are necessary for future SESAR deployment. The IDSG agreed on an Interim Deployment Programme (IDP) (a precursor of the Deployment Programme) in February 2013[78]. The IDP captures in a project view the most pressing implementation priorities.

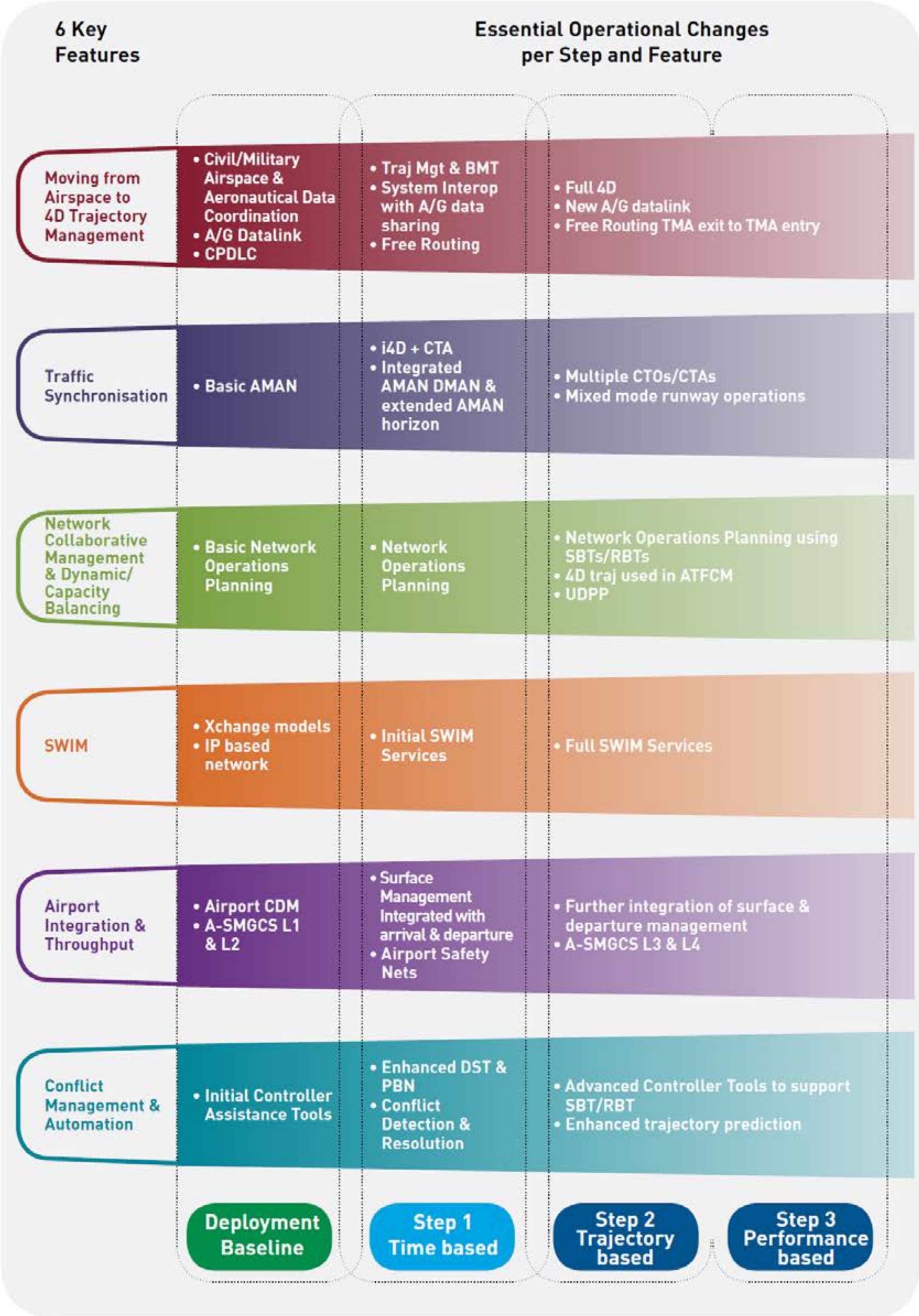
6.5.2 European ATM Master Plan

In October 2012, the second edition of the European ATM Master Plan[79] was issued. Within the SES initiative, the Master Plan is the agreed roadmap driving the modernisation of the ATM system and connecting SESAR research and development with deployment. It is the key tool for SESAR deployment, providing the basis for timely, coordinated and efficient deployment of new technologies and procedures.

[78] Interim Deployment Programme, Interim Deployment Steering Group, Version 3.1, February 2013

[79] European ATM Master Plan, Edition 2, October 2012

Figure 6.7: Key Features of European ATM Master Plan



Source: European ATM Master Plan, Edition 2

The first edition of the European ATM Master Plan was endorsed on 30 March 2009 and adopted on 12 June 2009 by the SESAR Joint Undertaking (SJU) which is responsible[80] for the maintenance of the Master Plan. The 2012 second edition of the Master Plan embeds major updates which mark a clear distinction compared with the initial document:

- it takes benefit of the first results achieved by the SESAR Programme to prioritise a set of essential changes that either provides significant performance benefits and/or forms a pre-requisite towards the implementation of the target concept;
- it prepares for the SESAR deployment phase, developing stakeholder roadmaps which provide a temporal view (up to 2030) of the ATM Technology Changes required and updating the Business View, providing a basis for timely and synchronised deployments;
- it promotes and ensures interoperability at global level, in particular in the context of ICAO.

The transition towards the target Operational Concept follows three complementary Steps. Step 1, Time-based Operations is the focus of the current Master Plan and progresses through Step 2, Trajectory-based Operations to Step 3, Performance-based Operations. Step 1 starts from the Deployment Baseline consisting of operational and technical solutions that have successfully completed the R&D phase and have been implemented or are being implemented.

As shown in Figure 6.7, the Master Plan identifies essential operational changes for Step 1 which should establish the foundations for the subsequent steps while responding to the performance needs. These changes are grouped in 6 Key Features that describe the main strategic orientations and are the means to deliver performance to achieve the performance goals.

The second edition of the European ATM Master Plan outlines the essential operational changes and technological changes that are required to contribute to achieving the SES performance objectives, preparing the Master Plan to become a key tool for SESAR deployment, through common projects, and providing the basis for timely and coordinated deployment of the efficient technologies and procedures.

6.6 Other ATM Developments in 2012

6.6.1 Initial 4D Flight

In February 2012, the world's first flight using a four dimensional optimised and upgraded Air Traffic Management (ATM) technology took place with Airbus' dedicated A320 test aircraft flying from Toulouse to Copenhagen and Stockholm. The project is called I-4D (Initial-4D). The main benefits of I-4D are a significant reduction of fuel burn and $C0_2$ emissions, in line with SESAR's target to reduce the environmental impact per flight by ten percent, a decrease of delays and therefore shorter and smoother flights for passengers.

This flight test provided a concrete solution towards improving the existing European system which is reaching its capacity limit. It was a world premiere in the ongoing transformation of the current air traffic management system. Once proven and industrialised, it will allow aircraft to plan and fly an optimized and efficient profile without any need for the controllers to provide any vectoring instruction. This will bring

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

better predictability of the traffic flows and facilitate Continuous Descent Operations into airports. As a result, aircraft flying in a holding pattern will be notably reduced.

I-4D trajectory management relies on an aircraft function that predicts and transmits data to the ground enabling the aircraft to accurately fly a trajectory after coordination with the ground systems. This is called a 4D-trajectory as it is described in three dimensions (lateral, longitudinal and vertical) and it includes one target time at a specific merging point (time as the fourth dimension). I-4D is the first step in developing one of the essential pillars of the SESAR programme: conciliating the increasing traffic density with the efficiency of flights. The flight test was the culmination of several months of collaboration between SESAR partners. More flight trials and simulations are underway with the first I-4D operation is planned in Europe from 2018 onwards.

6.6.2 CPDLC for Upper Area Control

In March 2012, Deutsche Flugsicherung (DFS) became the first national ANSP to introduce controller-pilot data link communications (CPDLC) for upper area control at its control centre in Karlsruhe. Karlsruhe and the Eurocontrol Control Centre in Maastricht are partners in this endeavour. Parallel to speaking with pilots via radiotelephony, air traffic controllers in Karlsruhe can now also communicate with the cockpit using short standardised text messages. Having started the service with one airline, Lufthansa German Airlines, four additional airlines have now started using data link communications with the Karlsruhe Control Centre and the service continues to be expanded.

The outlook for CPDLC is promising. Eurocontrol predicts that routine messages, which can be communicated in future via data link communications, are equivalent to 50 percent of the working time of an air traffic controller today. If 75 percent of cockpits were equipped with data link, capacity could be increased by up to 11 percent. CPDLC has been made available in Karlsruhe as part of a Eurocontrol programme called LINK 2000+ which was launched to promote CPDLC services throughout European airspace.

Data link has been on offer and in use in operations in the airspace controlled by Maastricht since 2003. Around 520 data link messages are exchanged between the control centre and pilots daily. The expansion of the data link network in Europe to adjacent control centres will increase the acceptance of the technology significantly. Both airlines and ANSPs will benefit from this.

The introduction of CPDLC in Karlsruhe is a milestone in the process of implementing data link in all of Europe. The promising test runs and the years of experience using the system at the control centre in Maastricht have demonstrated the potential of this technology to more effectively respond to an increasing volume of air traffic in the future.

6.6.3 Snow and Ice Reporter

In March 2012, Finland reported that its airports had been benefitting as a result of a new runway reporting system, called Runway Reporter that had been introduced during the winter period at almost all airports maintained by Finavia. The new system forwards runway conditions information in real time and in fixed format simultaneously to air traffic controllers and aircraft crew. Runway Reporter provides information about the material (e.g. snow and ice) on the runway surface, and about the level of friction. Based on the information, the pilot can take off and land optimally, in a safe and smooth way. The advantage of the new system is that information reporting is faster than before, and the quality is consistent at all airports. The recently introduced Runway Reporter system is used by 24 airports maintained by Finavia, and is expected to be introduced at Helsinki Airport along with other system upgrades during winter season 2013-2014.

6.6.4 Advances in Aircraft Landing Systems and Control Procedures

In March 2012, Atlantic Airways became the first airline in Europe to use required navigation performance (RNP) procedures on a commercial flight. The sophisticated equipment will enable the airline to improve airport access and reliability at its operationally-demanding Faroe Islands base.

The RNP-AR 0.1 navigation system was developed by Airbus subsidiary Quovadis, working with Atlantic Airways as part of a bespoke Airbus A319 package. It uses sophisticated positioning equipment to enable flight crews to operate approach and take-offs in challenging weather conditions that are typical in the Faroe Islands. It also guides pilots along the non-linear approach path to Vágar Airport, necessitated by the high terrain at either end of the runway.

In May 2012, an Airbus 330 from Etihad Airways performed the first high precision and environmentally efficient RNP-AR (Required Navigation Performance – Authorisation required) approach to Abu Dhabi International airport. These new technology approaches, designed by Airbus' Performance Based Navigation (PBN) subsidiary, Quovadis, utilize 'continuous descent' operations and optimised trajectories which shorten the approach paths to the runway thereby reducing noise, flight times and minimising fuel consumption and CO_2 emissions. Overall, each RNP-AR approach can reduce fuel consumption by 100 to 200kg and reduce CO_2 emissions by at least 20,000 tonnes per year.

In June 2012, JetBlue Airways became the first US airline to use satellite based RNP-AR for its A320s into New York JFK. The unique procedures are designed to utilise a constant vertical descent in conjunction with a precise curved flight path to the runways. In October 2012, the FAA announced a partnership program with JetBlue Airways to modernise approaches and descents into six Florida airports, including Miami and Orlando, as part of the transition to a satellite-based NextGen ATC system.

In July 2012, an 18-passenger aircraft serving the island of Alderney, located off the French coast of Normandy, became the first to be outfitted and certified to use the European Geostationary Navigation Overlay Service, or EGNOS. The system, which makes use of GPS signals to guide aircraft to the runway, is particularly useful when visibility is limited. Aurigny Air Services, which provides the only commercial flight services to Alderney, plans to upgrade the rest of its fleet. Next to sign up are Scotland's Loganair and Hebridean and the UK's Skybus. Similar systems are being developed in the United States, Japan, India and Russia.

In September 2012, following a successful six month trial, Glasgow airport became the first airport in the world to install a new unsafe altitude warning system for air traffic control. The system uses NASA satellite data to create a three-dimensional map of the ground around Glasgow Airport, and uses it as a model to test unsafe altitudes. The technology, developed by UK NATS, will allow air traffic controllers to test flight paths with perfect accuracy, while maintaining a safe distance from the ground. The new system is the most accurate in the world. It brings improved safety for aircraft and will give controllers even greater confidence. It has been verified to trigger when aircraft are either entering a dangerous rate of descent or are in close proximity to the ground. NATS plans to roll out the newly enhanced system to other airports across the UK.

6.6.5 FAA/A6 ANSPs Joint Statement of Purpose

In March 2012, an alliance of some of the largest European Air Navigation Service Providers – the A6 – and the United States' Federal Aviation Administration signed a Joint Statement of Purpose signalling their intention to move together towards a future interoperable aviation system that is operationally driven and technology enhanced.

The signing of this Joint Statement of Purpose (JSOP) signals an intention to seek areas of mutual interest such as systems implementation, programme management and engaging air traffic controllers in the transition to these new systems. The idea behind the JSOP is to create a forum for discussing and collaborating on future systems and sharing information and best practice on deployment. Future cooperation between A6 and the FAA is aimed at benefitting the entire global aviation community.

The A6 is a group of leading Air Navigation Service Providers in Europe with the main objective of shaping the modernisation of air navigation services. It is formed of the six ANSP members of the SESAR JU – Aena (Spain), DFS (Germany), DSNA (France), ENAV (Italy), NATS (UK) and NORACON – a consortium involving Austro Control (Austria), AVINOR (Norway), EANS (Estonia), Finavia (Finland), IAA (Ireland), LFV (Sweden) and Naviair (Denmark). Collectively its organisations control over 70% of European air traffic and 72% of the investment in the European Air Traffic Management infrastructure of the future.

6.6.6 Mode S Elementary Surveillance Implementation – Phase 2

In May 2012, Secondary Surveillance Radar (SSR) Mode S Elementary Surveillance (ELS) implementation in Europe was expanded to include a much great number of flights, taking the initiative into its second phase. The use of SSR ELS, initially applied only to flights operating on city pairs within Mode S airspace, but now includes all flights originating outside but then remaining within Mode S airspace. This increases the number of eligible flights from approximately 1,000 a day to nearer 4,000.

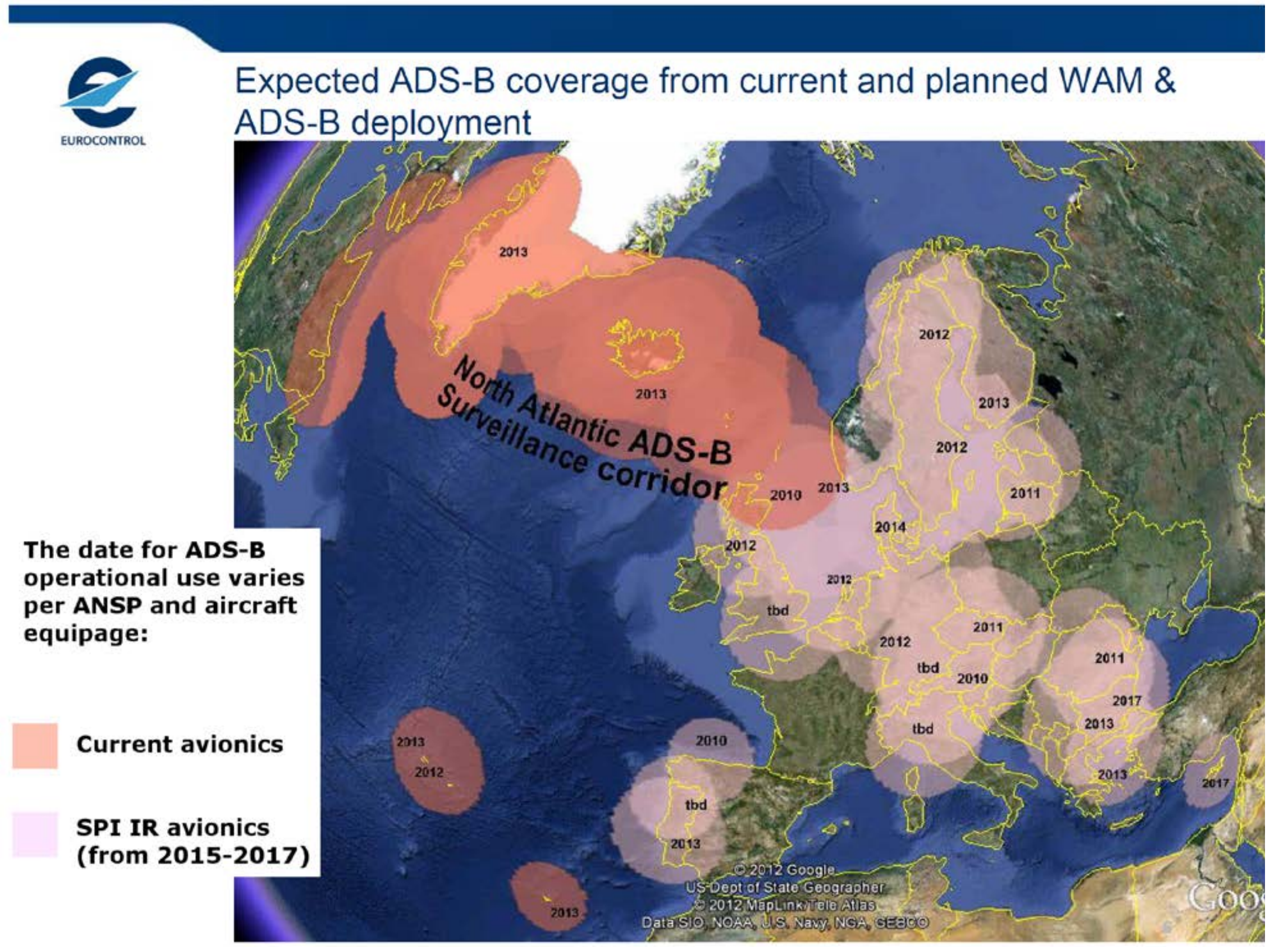
Whilst traditional SSR stations interrogate all aircraft within their range, Mode S (Select) establishes selective and addressed interrogations with aircraft within its coverage. Such selective interrogation improves the quality and integrity of the detection, identification and altitude reporting. These improvements translate into benefits in terms of safety, capacity and efficiency – benefits which are key to supporting the future of the high-traffic density airspace of Europe. The 2012 Initial Operating Capability is underpinned by Commission Implementing Regulation (EU) No 1206/2011 of 22 November 2011 laying down requirements on aircraft identification for surveillance for the single European sky, and by ICAO and Eurocontrol agreements for non EC states.

6.6.7 Wide Area Multilateration (WAM) and Automatic Dependent Surveillance-Broadcast (ADS-B)

Wide area multilateration (WAM) is a Surveillance technique that exploits the 1090 MHz transmissions broadcast from aircraft. From these signals it can create a track containing parameters such as aircraft identification, position, height, etc. Active interrogation is also possible in order to trigger transmission. Automatic Dependent Surveillance-Broadcast is a Surveillance technique that relies on aircraft broadcasting their identity, position and other aircraft information. This signal can be captured for Surveillance purposes on the ground (ADS-B out) or on board other aircraft/vehicles (ADS-B in). The latter will enable airborne traffic situational awareness (ATSAW), spacing, separation and self-separation applications.

Although the manner in which WAM constructs Surveillance data differs significantly from ADS-B, the synergies between these two Surveillance techniques in addition to their high performance and lower cost are expected to bring significant operational benefits. ADS-B and WAM are key enablers of the future European ATM Network, contributing to the achievement of the Single European Sky (SES) performance objectives, including safety, capacity, efficiency and environmental sustainability. The Eurocontrol CASCADE Programme co-ordinates the deployment of initial ADS-B applications and WAM in Europe (Figure 6.8).

Figure 6.8: Expected ADS-B coverage from current and planned WAM and ADS-B deployment



Source: Eurocontrol

The widespread introduction of ADS-B within European airspace is being facilitated through legislation published by the European Commission (derived from the Surveillance Performance and Interoperability Implementing Rule – SPI IR[81]). Furthermore, the Eurocontrol CASCADE Programme through the ATSAW Pioneer Project partnering with airlines, ANSPs, and industry, is catalysing the operational use of ADS-B to provide an airborne traffic situation picture to the flight crew. Six airlines (with 28 aircraft) are currently equipping with certified ATSAW equipment. ATSAW operations in Europe started in February 2012.

[81] Commission Regulation (EU) No 1207/2011 of 22 November 2011 laying down requirements for the performance and the interoperability of surveillance for the single European sky

In July 2012, NATS commissioned the UK's first WAM supporting a radar separation service. The WAM system, now operational at Edinburgh Airport, provides NATS' air traffic controllers with the precise surveillance needed for the separation of arriving and departing flights. WAM uses multiple low-maintenance, non-rotating sensors to triangulate an aircraft's location based on transponder signals. This provides air traffic controllers with precise aircraft position and identification information regardless of weather conditions, helping to increase the safety, capacity and efficiency of airspace

ADS-B and/or WAM are currently being deployed not only in Europe, but also in other regions worldwide (Asia, Australia, Canada, USA).

6.6.8 Remotely Piloted Aircraft Systems (RPAS)

The development of Remotely Piloted Aircraft Systems (RPAS) has opened a promising new chapter in the history of aerospace. Military exploitation of Unmanned Aerial Systems (UAS) has grown significantly in the recent years. However this trend has so far not been followed by the civil sector.

RPAS can offer a wide range of civil applications for the benefit of European citizens and businesses. Being remotely piloted, RPA can perform tasks that manned systems cannot perform, either for safety or for economic reasons.

RPAS are well suited for long duration monitoring tasks or risky flights into ash clouds. They can efficiently complement existing manned aircraft or satellites infrastructure used by governments in crisis management, border control or fire fighting. RPAS can also deliver profitable commercial aerial services in various areas, such as in precision agriculture and fisheries, power or gas line monitoring, infrastructure inspection, communications and broadcast services, wireless communication relay and satellite augmentation systems, natural resources monitoring, media and entertainment, digital mapping, land and wildlife management, air quality control and management.

In order to examine the economic impact of this emerging technology and identify the obstacles to the development of civil RPAS applications, the European Commission conducted a broad stakeholders' consultation. Between 2009 and 2012, three major initiatives have been launched, allowing an extensive exchange of views with the RPAS Community.

The Staff Working Document "Towards a European strategy for the development of civil applications of Remotely Piloted Aircraft Systems (RPAS) " (SWD(2012)259) was published in September 2012 and reports the outcomes of an extensive consultation held between June 2011 and February 2012, organised through 5 workshops known as the UAS Panel Process. The main conclusions presented in the Working Document were:

- RPAS present an important potential for the development of innovative civil applications (commercial, corporate and governmental) in a wide variety of sectors to the benefit of European society by creating jobs and achieving useful tasks.
- To unleash this potential the first priority is to achieve a safe integration of RPAS into the European air system as soon as possible.
- This requires the development of appropriate technologies and the implementation of the necessary aviation regulation at EU and national levels. Issues like privacy and data protection or insurance must also be addressed.

- It also requires an increased coordination between all relevant actors (EASA, national Civil Aviation Authorities, EUROCAE, Eurocontrol, JARUS, industry etc.) and between regulatory and technological developments.

Given the urgency to achieve RPAS safe integration into civil airspace, the UAS Panel called upon the European Commission to lead in the development of an RPAS Roadmap that will provide a strategy for achieving RPAS integration into the European air system from 2016. It will identify the actions needed to ensure the development by the European Aviation Safety Agency (EASA) of the regulation necessary for large RPA (> 150kg) and support the development of harmonized regulation for light RPA (< 150 kg) by national Civil Aviation Authorities. It will provide a research agenda defining the required technology developments and propose measures to address the societal impact of RPAS (privacy/data protection, insurance etc.). The Roadmap will include a rolling plan that will span over 15 years.

DG Enterprise and DG Transport are currently preparing the RPAS Roadmap with the support of 3 temporary Working Groups gathering the necessary expertise around the 3 main areas covered by the Roadmap: aviation regulation, technology and societal impact.

In order to support the implementation of the Roadmap, the European Commission has set-up a European RPAS Steering Group (ERSG) gathering the organizations contributing to achieve the tasks defined in the Roadmap. The Group will endorse the Roadmap, report the progress achieved on a yearly basis and update the Roadmap when necessary. The following bodies are currently members of the Steering Group: EC, EASA, Eurocontrol, ECAC, EUROCAE, SESAR JU, JARUS, EDA, ESA, ASD and UVSI. The composition of the Group may evolve according to the needs. The European Commission intends to submit the first issue of the Roadmap to the European RPAS Steering Group for endorsement in spring 2013.

In conjunction with the regulatory developments, the SESAR JU launched in April 2012 a specific study on the integration of UAS in non-segregated airspace in a SESAR air traffic management scenario. The study, known as ICONUS (Initial CON OPS for UAS in SESAR) will be carried out by the ATM FUSION Consortium of Associate Partners to the SJU. The Consortium, led by France's ONERA, includes five other European entities with long experience in the field of UAS: AVTECH (Sweden); CIRA and Deep Blue (Italy); ENAC (France) and INTA (Spain).

The study will allow the definition of the requirements in terms of capabilities and equipment which UAS users will need to operate in a SESAR environment safely and efficiently.

This study will allow the SESAR JU to understand for instance how UAS will be able to implement new flight separation modes. The study will also show how UAS operations will be influenced by the upcoming paradigm shift in ATM, from airspace-based operations (where airspace users are entirely subdued to all airspace constraints) to trajectory-based operations (where the different elements of air navigation can adapt to ensure the best possible trajectory).

6.6.9 ICAO 12th Air Navigation Conference and Amended Global Flight Plan

In November 2012, the ICAO 12th Air Navigation Conference was held in Montreal. The conference saw agreement on a draft revised Global Air Navigation Plan (GANP) that will guide industry planning and implementation activities over the next two decades. More than 1,000 delegates from 120 Contracting States and 30 International Organisations attended the conference to agree the next steps to achieving an interoperable, seamless and global air traffic management system for international civil aviation. For the first time, the GANP includes a timeline for which future improvements can be implemented by States in accordance with their needs.

ICAO created the overall blueprint for a new global system over twenty years ago. Since then the concepts have been explored and refined, strategic plans have been developed, and the required technology has matured. Over the past decade ICAO member states have initiated a number of programmes based on the ICAO blueprint. Their aim is to increase airspace capacity and reduce costs and delays. Currently NextGen and SESAR are among the most advanced in terms of cooperation. SESAR and NextGen have similar goals and are driven by similar requirements. They draw on CNS[82]/ATM concepts and are strongly influenced by the ICAO Global ATM Operational Concept[83] (GATMOC).

The Conference unanimously endorsed the Aviation System Block Upgrades (ASBUs) framework (Figure 6.9) introduced by ICAO to set goals in terms of operational improvements on a consensus-driven basis. The ASBUs allow for development at regional and sub-regional level to also align with wider interregional goals of optimising capacity and improving flight path efficiencies.

Figure 6.9: ATM System Block Upgrades

Aviation System Block upgrades

Block	0: Initial improvements and deployment of available capabilities	1: New capabilities and further improvements	2: Further new capabilities, next level of improvements	3: Advanced capabilities
Examples of likely improvements	• improved runway safety • improved airport operations • digital AIM • PBN • FUA • improved ATFM • improved air traffic situational awareness	• remote tower • improved approach & departure management • SWIM • enhanced flow performance • integrated weather information • improved climb & descent procedures & profiles • optimisation of Block 0 improvements	• advanced wake vortex separation • multi-centre ground-ground integration • airborne participation in SWIM • increased user involvement in network use management • advanced collision avoidance • optimisation of Block 0 and 1 improvements	• synchronised arrival, departure & surface management • full flight data exchange • traffic complexity management • full 4D TBO

Source: Aerospace International based on ICAO

November 2012 also saw the successful global real-time transition to a new aircraft flight plan in operation in all 191 ICAO Member States. These changes were mandated by ICAO Amendment 1 to PANS-ATM Doc 4444. The existing ICAO flight plan had inadequate provision to accurately describe a modern

[82] CNS = Communications Navigation Surveillance

[83] Global ATM Operational Concept, ICAO Doc 9854, 2005

aircraft's navigational capabilities. Therefore ATM systems were currently unable to extract, interpret and display an aircraft's true capabilities from the previous version of the flight plan.

The increasing trend towards Performance Based Navigation (PBN) and Required Navigation Performance (RNP) procedures and dependencies on airborne equipment for the issuing of airways clearances and application of separation standards meant that a more accurate presentation and interpretation of the capabilities of aircraft was required. In particular, Amendment 1 introduced the ability to convey precise and comprehensive descriptions of an aircraft's communication, navigation and surveillance capabilities as now captured in Items 10 and 18 of the amended flight plan. ATM systems will be able to read and interpret this data and display it accordingly to operational positions and use in conflict detection software.

7. Market & Competition Issues

7.1 Introduction

This section on market and competition issues begins with a report on the EU's external aviation policy as reviewed in 2012. It then seeks to report on developments concerning air service agreements between the European Union and key partners, and also selected progress in other areas of the world such as Japan, the United States, the Middle East and India.

The impact of the creation of a European Common Aviation Area (ECAA) on growth of air services and increased competition in the intra-ECAA market has been examined, as well as a brief analysis of two extra-ECAA markets between the EU and third countries that have recently concluded comprehensive air service agreements with the EU. An update of public service obligation (PSO) provision in Europe is also detailed.

The section moves on to consider competition issues in Europe, focussing on state aid, the Boeing versus Airbus subsidy-dispute, mergers, cartels and antitrust legislation.

7.2 EU External Aviation Policy

EU external aviation policy was defined in 2005 in a Road Map developed by the Council of the European Union and the European Commission. In September 2012 the Commission launched a review of the policy and presented a Communication COM(2012)556, entitled "The EU's External Aviation Policy – Addressing Future Challenges". The review scrutinised the Road Map's objectives and provided an update of progress made since its development.

The Road Map was based on three defining pillars:

1. Bringing existing bilateral air services agreements between EU Member States and third countries in line with EU law;

2. The creation of a true Common Aviation Area with the neighbouring countries;

3. The conclusion of aviation agreements with key strategic partners.

A focus on these areas was intended to enable the EU to face the three major challenges facing the European aviation sector: the shift of growth towards other regions of the world; the emergence of intense international competition, and the competitiveness of the EU aviation sector.

The 2012 review highlighted some of the key achievements of the external aviation policy so far, outlined in the Commission's memo of 27 September 2012[84].

[84] EU External Aviation Policy Package; European Commission; MEMO/12/714; 27/09/12
http://europa.eu/rapid/press-release_MEMO-12-714_en.htm

The Commission has sought to restore legal certainty to bilateral air services agreements between EU Member States and non-EU countries by bringing these into conformity with EU law:

- In total nearly 1,000 bilateral air services agreements have been brought into legal conformity with EU law representing 75% of all extra-EU passenger traffic.
- Some 117 non-EU countries have recognised the principle of EU designation. Of these, 55 countries have agreed to amend all their bilateral agreements with EU Member States through Horizontal Agreements with the EU, while the remaining countries have done so on a bilateral basis with individual EU Member States.
- There is still work to be done with a few important aviation countries, to complete the implementation of EU designation. These include India, China and South Korea and also South Africa, Kenya, Nigeria and Kazakhstan. Of these countries, South Africa, Kenya, Nigeria and Kazakhstan are yet to recognise the principle of EU designation at all.
- These changes recognise the removal of national ownership and control restrictions on EU carriers as required by EU law (including recognition of possible mergers between EU carriers). As a result, EU carriers can offer services from any EU Member State to non-EU countries, provided that designation rights and traffic rights are available under the relevant bilateral air services agreements.

The Commission has sought to develop a wider Common Aviation Area with EU neighbouring countries:

- Solid progress has been made in developing a wider Common Aviation Area with neighbouring countries, with agreements already signed with the Western Balkans, Morocco, Georgia, Jordan, Moldova and soon with Israel. Negotiations are on-going with Ukraine, Lebanon, Azerbaijan and Armenia. Negotiations should start soon with Tunisia. The economic benefits for consumers resulting from the Western Balkans and Morocco agreements have been estimated at more than € 3.5 billion between 2006-2011 in the case of the EU-Morocco agreement, with significant growth in air traffic between the EU and Morocco and many new routes and carriers, resulting in more competition, choice and lower prices. There has been a real decline in passenger fares of around 40% since 2005. Similarly, the EU-Western Balkans "European Common Aviation Area Agreement" (the ECAA agreement) has generated a total economic benefit of more than € 2.4 billion between 2006 and 2011.

The Commission has sought to negotiate comprehensive air transport agreements with key partners:

- The EU has negotiated comprehensive air transport agreements with a number of major partners (United States, Canada and Brazil). These comprehensive agreements aim at a combination of market opening, creating conditions for fair competition through regulatory convergence, liberalisation of ownership and control of airlines and resolving "doing business" issues. A first stage agreement with the U.S was signed in April 2007 and a second stage agreement in June 2010. An agreement was signed with Canada in December 2009. A comprehensive air transport agreement was initialled with Brazil in March 2011 (signature pending).

Following the Commission's Communication COM(2012)556 published in September 2012, the Council of the EU offered its conclusions on the external aviation policy in December[85], to serve as guidance for policy-making, action and relations.

- The Council stressed the importance of aviation connectivity to the economic health, competitiveness and cohesion of the EU, but recognised that the European aviation sector and EU airlines in particular are facing difficult challenges from both a depressed demand and strong competition.
- In terms of progress since the creation of the Road Map in 2005, the Council regretted that "a few partner countries remain reluctant to recognise, or yet fully recognise, the principle of EU designation in bilateral air services agreements with EU Member States" and urged action to address this.
- The Council also requested that the comprehensive air transport agreement already negotiated with Brazil be signed as a matter of urgency to prevent further delay of the benefits the agreement can bring.
- In the area of fair competition and ensuring a level playing field for all parties, the Council recognises that Regulation (EC) No 868/2004, designed to protect EU airlines against subsidisation and unfair pricing practices, requires revision to more adequately address the specific characteristics of the aviation sector.
- In enhancing relations with key partner countries, the Council was also encouraged that the Commission has identified that a tailored EU approach is now particularly appropriate to Turkey, India, Russia, certain Gulf states, ASEAN and China.

In its press release (MEMO/12/714) the Commission identified the EU's top 20 international markets (in 2010), to demonstrate the countries with which the EU must focus its efforts on.

Table 7.1 shows the historical growth in these key markets. Total extra-EU air passenger traffic increased at a solid 4.4% CAGR between 2004 and 2010. The United States is the largest international market for the EU (accounting for 16% of extra-EU total in 2010), but has lost market share since 2004 as a consequence of growing at a sub-par 1% average annual rate up to 2010. Current (2011/2012) data is unavailable from Eurostat to elicit whether the second stage of the EU-U.S 'open skies' agreement signed in 2010 has had any positive impact on passenger traffic levels, but the Office of Travel & Tourism Industries (OTTI) in the U.S reported that air passenger traffic between Europe and the U.S increased by 4% in 2012 versus 2011[86].

[85] Council conclusions on The EU's External Aviation Policy - Addressing Future Challenges; Council of the European Union; 20/12/12

[86] OTTI; Annual 2012 U.S-International Air Passenger Traffic http://tinet.ita.doc.gov/tinews/archive/tinews2013/20130222.html

Table 7.1: The EU's largest international markets – total passengers (millions) carried

Extra-EU Partner	2004	2005	2006	2007	2008	2009	2010	CAGR 2004-10	Market share 2004	Market share 2010
Total Extra-EU	224.5	244.6	257.7	270.8	282.3	271.3	291.4	4.4%	100.0%	100.0%
United States	45.2	47.2	48.0	50.6	51.4	47.2	47.2	0.7%	20.1%	16.2%
Turkey	21.1	23.7	21.0	23.6	25.2	25.6	30.1	6.1%	9.4%	10.3%
Switzerland	18.2	19.9	22.3	24.5	26.1	25.6	26.6	6.5%	8.1%	9.1%
Norway	10.1	11.1	12.6	13.9	14.8	13.7	15.0	6.7%	4.5%	5.1%
Egypt	9.2	9.6	9.5	11.4	13.1	12.5	14.0	7.2%	4.1%	4.8%
Russia	7.4	8.1	8.9	10.5	11.9	10.7	13.1	9.9%	3.3%	4.5%
United Arab Emirates	5.0	5.7	6.7	8.0	8.7	9.6	11.0	14.0%	2.2%	3.8%
Morocco	4.7	5.6	6.6	8.0	8.7	9.2	10.9	15.2%	2.1%	3.7%
Canada	7.8	8.5	8.7	9.3	9.2	8.7	9.0	2.6%	3.5%	3.1%
Tunisia	7.4	8.2	8.5	8.7	8.8	8.2	8.3	1.8%	3.3%	2.8%
Israel	4.1	4.4	4.6	5.5	6.0	6.0	6.7	8.8%	1.8%	2.3%
India	3.3	4.1	5.1	5.7	5.7	5.3	5.3	8.4%	1.4%	1.8%
China	3.4	4.2	4.8	5.2	4.9	4.7	5.2	7.5%	1.5%	1.8%
Brazil	3.6	4.2	4.1	4.4	4.8	4.4	4.9	5.5%	1.6%	1.7%
Japan	5.1	5.2	5.2	5.2	5.0	4.6	4.6	-1.5%	2.3%	1.6%
Thailand	3.8	3.8	4.2	4.5	4.5	4.3	4.3	2.3%	1.7%	1.5%
Algeria	2.4	2.6	2.7	2.9	3.1	3.4	3.5	7.0%	1.1%	1.2%
Hong Kong	2.7	2.8	3.2	3.6	3.6	3.6	3.5	4.4%	1.2%	1.2%
Croatia	1.9	2.5	2.9	3.2	3.3	3.1	3.4	10.1%	0.8%	1.2%
Singapore	2.8	2.9	3.1	3.0	3.2	3.1	3.1	1.8%	1.2%	1.1%

Source: Eurostat

Contrast EU-Morocco traffic growth (+15% CAGR 2004-2010) with that of EU-Tunisia (+2%) and the difference is stark. It is perhaps too simplistic to suggest that the disparity of growth in the two markets is testament to the comprehensive agreement in place between the EU and Morocco, and the lack of one for the EU-Tunisia market. However, it is undeniable that the removal of restrictions on EU-Morocco routes has facilitated competition and stimulated demand in this market, resulting in benefits that the Commission hopes to achieve for the EU-Tunisia market.

Given the significant size and potential of the Indian and Chinese markets from an EU perspective, it is clear from Table 7.1 that both remain emerging markets. It is imperative that the comprehensive agreements proposed in 2005 by the Commission for a more liberalised regime between the EU and India and China are negotiated with urgency to realise the benefits of increased competition and traffic for all parties concerned. The same can be said of EU-Brazil. These are growing markets but the full potential cannot be reached until restrictions and barriers to entry are removed.

7.3 Air Service Agreements with Non-EU Countries

As noted above, one of the key areas of focus identified in the EU External Aviation Policy going forward is to enhance aviation relations with neighbouring countries and other key international partners.

In 2012, there were relatively few developments in this area, with only Israel and Moldova concluding comprehensive air transport agreements with the EU.

EU-Israel

On 30 July 2012, the EU and Israel initialled a comprehensive aviation agreement, following eight rounds of negotiations since December 2008, culminating in a final round of negotiations in March 2012.

The EU reported that the agreement will gradually open up and integrate the respective markets, strengthen cooperation and offer new opportunities for industry, including airlines, and consumers[87]. As a result of the agreement, all EU airlines will be able to operate direct flights to Israel from anywhere in the EU and Israeli carriers will be able to operate flights to airports throughout the EU. It is envisaged that the EU-Israel air transport market will be opened gradually so that by the start of the summer season in 2018, the market will be fully open with no restrictions on the number of weekly flights between Israel and the EU.

It is expected that the gradual opening of the market will encourage a larger number of direct flights between more destinations in Israel and Europe, while reducing air fares for travellers, potentially creating additional jobs and economic benefits on both sides. The gradual implementation of the agreement will give sufficient time for carriers on both sides to prepare for increased competition.

In parallel to gradually opening up the respective markets, the agreement also aims to integrate Israel into a wider Common Aviation Area with the EU. Israel will implement regulatory requirements and standards equivalent to EU aviation rules in areas such as aviation safety, environment, consumer protection, including passenger rights, air traffic management, economic regulation, competition issues and social aspects.

In April 2013 the Israeli Cabinet finally approved the agreement, with Israel's Prime Minister stating[88] that "the goal of the reform that we approved… is to lower the prices of flights to and from Israel and to increase incoming tourism". This was set against the backdrop of concern amongst some sections of Israel's aviation industry that the country's airlines will struggle to compete against the EU's larger international rivals.

One potential consequence of increased liberalisation in the EU-Israel market is growth in the low cost sector. In March 2012, LCC penetration on international routes to/from Israel[89] was a mere 7.3% of seat capacity, led by air berlin and easyJet. It has been suggested that LCCs may, however, be reluctant to increase operations into Israel due to the prohibitively high costs involved with the significant security procedures at Tel Aviv Ben Gurion airport.

EU-Moldova

[87] Aviation: Israel to join Europe; European Commission; 31/07/12 http://ec.europa.eu/transport/modes/air/international_aviation/common_aviation_area/doc/2012-07-31-aviation-israel-to-join-europe.pdf

[88] Israel approves 'Open Skies' deal with EU; 21/04/13 http://news.yahoo.com/israel-approves-open-skies-deal-eu-125135712--finance.html

[89] CAPA; Israeli market set to open up under new open skies agreement with EU; 26/03/12 http://www.centreforaviation.com/analysis/israeli-market-set-to-open-up-under-new-open-skies-agreement-with-eu-70449

In June 2012, the Republic of Moldova and the EU signed a comprehensive air services agreement that will open up and integrate the respective markets, strengthen cooperation and offer new opportunities for consumers and airlines.

The European Commission stated that the EU and Moldova will develop this "Common Aviation Area" based on common rules in important areas such as aviation safety and security, with Moldova harmonising its legislation with European standards and further implementing EU aviation rules in areas such as environment, consumer protection, air traffic management, economic regulation, competition issues and social aspects.

With the establishment of the agreement, all EU and Moldovan carriers will be able to operate direct flights between the EU and Moldova.

EU-Russia

Currently, Russia's aviation relationship with the European Union exists in the form of individual Air Service Agreements with EU Member States. The vision is to develop a comprehensive EU-Russia agreement that will enhance cooperation and create material benefits for both parties. Irrespective of this, the Commission requested EU Member States in 2010 and 2011 to bring their respective bilateral agreements with Russia into line with EU law. Despite some progress, the main issues (acceptance of an EU designation clause and deletion of references to mandatory commercial agreements between designated air carriers) still remain to be resolved.

7.4 Impact of Creation of a European Common Aviation Area (ECAA)

In 2006, the EU, its Member States and the Western Balkans signed the ECAA Agreement with the aim to extend the European single aviation market to this part of the world through incorporation of the related partners[90], in this market and the creation of the European Common Aviation Area (ECAA). The primary purpose was to remove constraints to growth and enable competition, as well as to bring those 'outside' markets in line with EU aviation standards, including safety and security.

To the extent that this vision of increased traffic and competition has been realised, the following analyses derived from historical OAG schedules looks closely at seat capacity provision and the number of airlines operating in these ECAA markets. It might be reasonably expected that, since the signature of the ECAA Agreement in 2006, the rate of growth in capacity and competition has outstripped that of pre-2006 levels, due to the removal of restrictions. Indeed, liberalisation and deregulation has led in the U.S and in Western Europe to the growth and expansion of low cost carriers in particular, emerging in markets that had hitherto been inaccessible due to restrictive air service agreements.

A note of caution must be added to these analyses, however. Since 2008, growth in capacity has been adversely affected by the European financial and sovereign debt crises, impacting demand in some

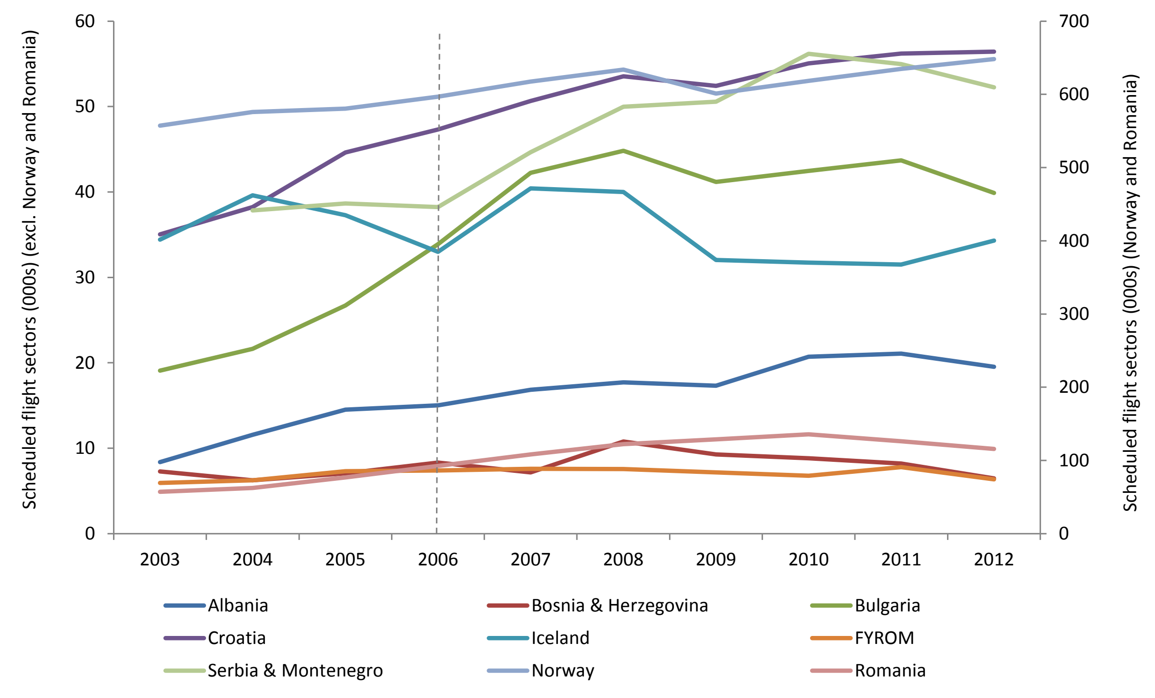
[90] Albania, Bosnia and Herzegovina, Bulgaria (joined the EU in 2007), Croatia, Iceland, former Yugoslav Republic of Macedonia, Norway, Romania (joined the EU in 2007) and Serbia, Montenegro and Kosovo (This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of independence)

markets more than others. So the consequences of liberalisation on capacity and competition may not be immediately apparent.

7.4.1 Impact on growth of air services

Figure 7.1 and Table 7.2 shows the historical number of intra-ECAA scheduled passenger flights for the post-2006 ECAA countries of Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Iceland, Former Yugoslav Republic of Macedonia, Norway, Romania and Serbia and Montenegro.

Figure 7.1: Number of Intra-ECAA scheduled passenger flights by country



Source: OAG

Note: Bulgaria and Romania joined the EU in 2007

Norway is the largest of the markets, in terms of frequencies on intra-ECAA routes. Growth in number of flights has been steady since 2003, maintaining average annual growth of around 2% to 2.5%. Although demand fell in 2009 and only returned to peak 2008 levels in 2011, air travel demand in the Norwegian market has been largely insulated from the worst impacts of the European economic downturn by the growth of low cost carrier Norwegian, the third largest LCC in Europe. Entry for Norway into the ECAA has arguably facilitated the LCC's growth in the market and allowed EU carriers to expand into Norway.

Growth in air travel demand on intra-ECAA routes in the Romanian market has been significant. In 2012, the number of scheduled passenger flights had doubled from the level in 2003. Because the growth rate pre-2006 (Romania's entry into ECAA) is higher than the post-2006 rate of growth, it is inconclusive as to whether the growth in demand can be attributable to the ECAA creation. However, former LCC Blue Air entered the Romanian market in 2006 but exited due to bankruptcy in 2011. This has been largely offset by the rise of Central and Eastern Europe's prominent LCC, Wizz Air. At the same time, the number of intra-ECAA flights by legacy carriers such as Tarom, Air France, Alitalia and Austrian Airlines has remained fairly flat. Only Lufthansa of the major network carriers has shown significant growth in the Romanian market since 2006, doubling flights between that year and 2012. The 2012 figure has been impacted by regional airline Carpatair's reduction in frequency, and Hungarian carrier Malev's cessation. Carpatair, in particular, has cited strong competition from LCCs as the primary reason for its retrenchment in Romania.

Table 7.2: Number of Intra-ECAA scheduled passenger flights by country (000s)

											CAGRs		
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2003-2006	2007-2008	2009-2012
Norway	557	576	581	597	617	634	601	618	635	648	2.3%	2.6%	2.5%
Romania	57	62	77	92	108	122	129	136	126	116	17.3%	12.9%	-3.5%
Croatia	35	38	45	47	51	54	52	55	56	56	10.5%	5.7%	2.5%
Serbia & Montenegro	-	38	39	38	45	50	51	56	55	52	0.5%*	11.9%	1.1%
Bulgaria	19	22	27	34	42	45	41	42	44	40	21.1%	6.1%	-1.1%
Iceland	34	40	37	33	40	40	32	32	32	34	-1.4%	-1.0%	2.3%
Albania	8	12	15	15	17	18	17	21	21	20	21.5%	5.2%	4.1%
Bosnia & Herzegovina	7	6	7	8	7	11	9	9	8	6	4.5%	50.3%	-11.4%
FYROM	6	6	7	7	8	8	7	7	8	6	7.6%	-0.2%	-4.0%
Grand Total	725	800	834	872	935	980	940	976	984	979	6.4%	4.8%	1.4%

Source: OAG

*CAGR 2004-2006

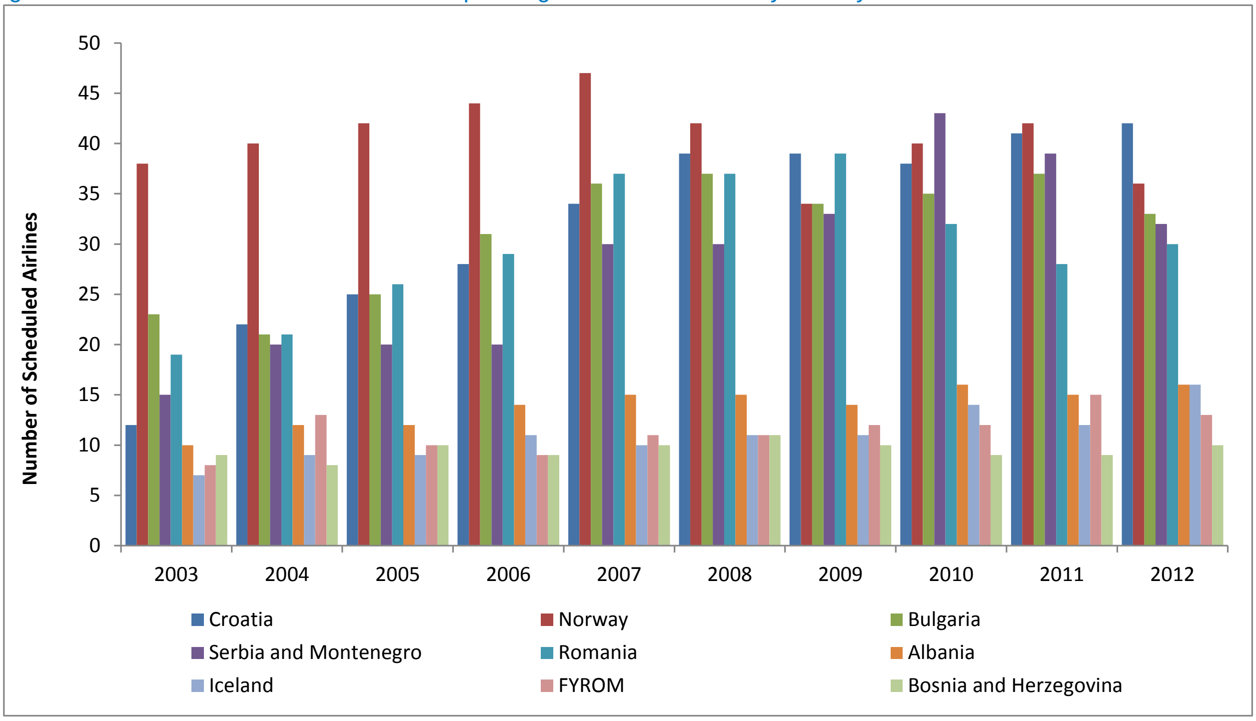
Albania's entry into the ECAA is epitomised by Tirana-based LCC Belle Air's introduction into the market in 2006, providing half of all scheduled intra-ECAA flights in 2012 by growing its network on these routes (as well as extra-ECAA charters). The decline and eventual insolvency in late 2011 of Albanian Airlines is the primary reason for the market's slower growth in number of intra-ECAA flights post-2006, compared to pre-2006 levels.

It is arguable that in expanding the European single aviation market, the ECAA has successfully facilitated the growth of the low cost carrier sector into markets previously dominated by the domestic full-network carriers. The impact of this increased competition, however, has varied by market, with some incumbent carriers retrenching or ceasing operations altogether.

7.4.2 Impact on Level of Competition

In terms of the expanded single aviation market creating increased competition in the post-2006 ECAA markets, the number of airlines operating intra-ECAA air services has been examined for the period 2003-2012 to observe the situation before and after ECAA expansion.

Figure 7.2: Number of scheduled airlines operating intra-ECAA routes by country



Source: OAG

It is quite noticeable from Figure 7.2 that the ECAA markets examined have collectively witnessed a 'flattening' in levels of competition on intra-ECAA routes, with some exceptions.

In 2012, Croatia enjoyed the highest level of competition on intra-ECAA routes and the growth in competition has been consistent throughout the observed time period between 2003 and 2012. Much of the growth is attributable to smaller scheduled operators offering seasonal services to leisure destinations in Croatia, as flag carrier Croatia Airlines dominates nearly 60% of the frequencies on intra-ECAA routes to/from the country. However, major European LCCs Ryanair, easyJet and germanwings have all entered the market since Croatia joined the common aviation area.

Norway, the largest of the ECAA markets analysed, has the next highest level of competition on intra-ECAA routes. In 2012, the Norwegian intra-ECAA market is controlled by three carriers – Wideroe, SAS and Norwegian – operating 86% of total intra-ECAA frequencies. In 2003, these airlines shared 58% of the total – although Braathens had 25% of this market in 2004 when it was merged with SAS. It is worth noting that the intra-ECAA market includes domestic Norway, which has many thin route monopolies unable to sustain competition.

Table 7.3: Number of scheduled airlines operating Intra-ECAA routes by country

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Number of additional airlines 2003-2006	Number of additional airlines 2006-2012
Croatia	12	22	25	28	34	39	39	38	41	42	16	14
Norway	38	40	42	44	47	42	34	40	42	36	6	-8
Bulgaria	23	21	25	31	36	37	34	35	37	33	8	2
Serbia and Montenegro	15	20	20	20	30	30	33	43	39	32	5	12
Romania	19	21	26	29	37	37	39	32	28	30	10	1
Albania	10	12	12	14	15	15	14	16	15	16	4	2
Iceland	7	9	9	11	10	11	11	14	12	16	4	5
FYROM	8	13	10	9	11	11	12	12	15	13	1	4
Bosnia and Herzegovina	9	8	10	9	10	11	10	9	9	10	0	1
Grand Total	141	166	179	195	230	233	226	239	238	228	54	33

Source: OAG

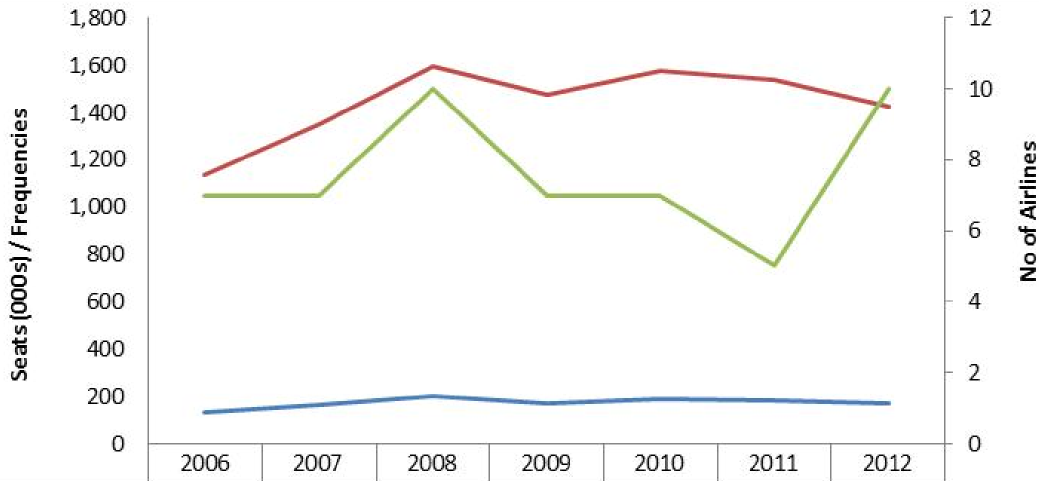
7.5 Impact of EU-comprehensive agreements

As encouraged in the external aviation policy recommendations, the European Union has sought to enter into comprehensive air service agreements with neighbouring partners to further extend the common aviation area. Georgia and Jordan have recently concluded such agreements with the EU.

The EU and Georgia signed a comprehensive air services agreement on 2 December 2010, following the horizontal agreement in place since February 2008. The agreement was introduced to open up and integrate the respective air transport markets of the Parties, and offer new opportunities for consumers and operators.

The EU and Jordan signed a Euro-Mediterranean Aviation Agreement on 15 December 2010, following the horizontal agreement signed in February 2008. The agreement enables all EU airlines to operate direct flights to Jordan from anywhere in the EU and vice-versa for Jordanian carriers and removes all restrictions on prices, routes and capacity of flights between the two markets.

Figure 7.3: EU-Georgia capacity and competition evolution 2006-2012



	2006	2007	2008	2009	2010	2011	2012
Seat Capacity (000s)	134.9	163.0	202.4	172.2	187.0	179.8	168.0
Frequencies	1,135	1,347	1,594	1,474	1,577	1,535	1,425
No. of Airlines	7	7	10	7	7	5	10

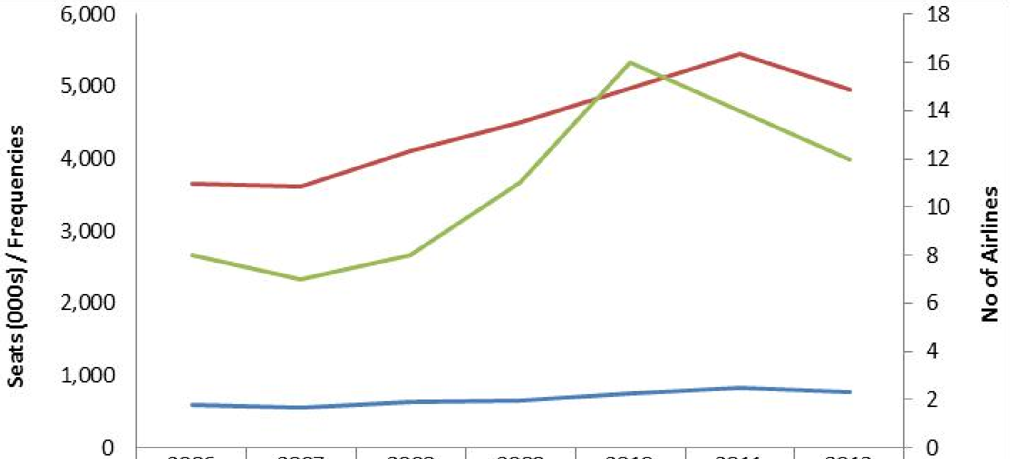
Source: OAG

The extent to which liberalisation has facilitated growth in air traffic and levels of competition in these markets by analysing time series datasets is inconclusive, for the same reasons identified in Section 7.4 above, where the European financial crisis has negatively influenced air travel demand on intra- and extra-EU routes.

Figure 7.3 and Figure 7.4 demonstrate that the general trend in air traffic growth and competition levels in the EU-Georgia and EU-Jordan markets has been positive between 2006 and 2012, albeit with some peaks and troughs in demand.

On routes between EU Member States and Georgia, seat capacity and frequencies have declined marginally since 2008 but have increased overall since 2006. In 2008 there was a spike in demand growth primarily due to the entry into the market of Czech Airlines and significant increase in capacity from UK carrier, bmi british midland. However, bmi's increase was offset by British Airways' (BA) market exit the same year and low cost carrier flyLAL ceased operations between Lithuania and Georgia to create a dip in demand in 2009. In 2011, the first full year since the signing of a comprehensive agreement, seat capacity fell by over 7,000 annual seats, with a further reduction in 2012 of nearly 12,000 seats compared to 2011. Competition in this market is dynamic, with new entrants in 2012 including Aegean, Alitalia and a resumption of services from BA, lessening the impact of a decline in services from Czech, Air Baltic and Georgian Airways.

Figure 7.4: EU-Jordan capacity and competition evolution 2006-2012



	2006	2007	2008	2009	2010	2011	2012
Seat Capacity (000s)	600.5	564.6	631.4	663.0	755.7	839.1	766.8
Frequencies	3,665	3,620	4,115	4,500	4,988	5,462	4,955
No. of Airlines	8	7	8	11	16	14	12

Source: OAG

Liberalisation of the EU-Jordan air transport market has followed a similar time-line to that of the EU-Georgia market. However, the overall size of the EU-Jordan market is greater and the growth has been more pronounced over the period 2006-2012. In 2011, following full liberalisation, the market witnessed 11% growth in seat capacity, more in line with expectations of what the removal of restrictions can result in. Royal Jordanian has consistently controlled around two thirds of the market during this time, but, except for Lufthansa and Air France, most other market players have exhibited erratic growth patterns. The EU low cost carriers of Transavia and Vueling have entered and exited the market, while easyJet was the only EU LCC to operate between the EU and Jordan in 2012.

7.6 International Developments (outside of the EU)

This subsection looks at selected developments and progress in air service agreements and other policy decisions outside of Europe in 2012.

Russia

Over the course of 2012, the Russian Federation has sought to amend various international air service agreements.

In May 2012 the Russian Deputy Minister of Transport said that "*the liberalised relations trend with different countries will continue, not only because Russia will join the World Trade Organization (WTO) but also because Russian airlines are trying to launch more international routes and compete with foreign* *carriers*"[91]. This statement came with the announcement of negotiations to liberalise the Russia-Kazakhstan bilateral agreement (details undisclosed).

In February 2013, the Senior Air Services Negotiator of the US DoT's Office of International Aviation announced that liberalising air service agreements with emerging economies is the United States' priority[92], "*We are in a very positive place with the Russians and we are taking a look at a wide range of things including over flight rights, greater market access and additional service points*".

In March 2013, Russia and Singapore liberalised their bilateral agreement with the removal of restrictions on the number of carriers, flights and aircraft types[93]. This allows Russia's carriers to operate regular flights from any point in Russia to Singapore. Airlines from Singapore are permitted to operate flights to Moscow, St. Petersburg, Khabarovsk, Vladivostok and five other to-be-determined Russian destinations. Carriers also received fifth freedom rights to extend routes to other destinations. According to the new agreement, airlines can apply for any points beyond Russia and Singapore, subject to approval from the local aviation authorities of the third countries.

Also in March, the Russian Transportation Ministry and the Federal Anti-Monopoly Service announced that they had approved new criteria for airlines seeking an international air service license[94]. In a move that could be considered in contravention of World Trade Organisation (WTO) rules, applicants for a future license will be assessed against three sets of criteria;

1. Applicants must have minimum flight delays and demonstrate high safety standards. The applicant also must possess IATA and IOSA international certificates and fly regularly.

2. Priority will be given to airlines not affiliated with a carrier that flies the same route. Fleets must include modern aircraft, and carriers must offer high-quality service, including convenient connecting flights and comfortable destination airports.

3. Applicants will be assessed on whether they operate Russian-made commercial aircraft, such as the Tu-204/214, SSJ-100 and AN-148.

Critics of the approved criteria argue that the framework will not create a transparent environment for competition, and moreover that authorities will violate antitrust laws if preference is given to operators of new Russian aircraft.

In April 2012, a dispute between Russia and Belarus led the two countries to negotiate changes in their bilateral agreement. With conflict revolving around frequencies on the Moscow-Minsk route, Belavia

[91] ATW Online; Russia, Kazakhstan to liberalise bilateral agreement; 17 May 2012; http://atwonline.com/aeropolitics/russia-kazakhstan-liberalize-bilateral-agreement

[92] Routes Online; China and Russia 'Priority' for US Air Service Liberalisation; 11 February 2013; http://www.routesonline.com/news/29/breaking-news/182548/china-and-russia-priority-for-us-air-service-liberalisation/

[93] ATW Online; Russia, Singapore liberalize bilateral agreement; 18 March 2013; http://atwonline.com/regulation/russia-singapore-liberalize-bilateral-agreement?NL=ATW-04&Issue=ATW-04_20130318_ATW-04_25&YM_RID=stefanie.zugmann@austrian.com&YM_MID=1380586&sfvc4enews=42

[94] The Moscow Times; Transportation Ministry Offers New International Airline License Criteria; 05 March 2013 http://www.themoscowtimes.com/news/article/transportation-ministry-offers-new-international-airline-license-criteria/476549.html

Belarusian Airlines lobbied authorities to grant an equal number of flights for both sides. Commencing on 27 April, Russia and Belarus agreed that each country will perform five daily Moscow-Minsk flights.

It was reported in October 2012 that Russia is considering allowing foreign LCCs to operate on domestic routes, a measure that would encourage lower fares to domestic destinations, making flights more affordable and stimulating demand. The current Russian air code prohibits foreign carriers from operating domestic flights, so the government would have to amend the air code if the change is made. The Russian authorities have suggested that the rules will be tested on one route or in one Russian region chosen by the government.

Japan

Japan and Macau signed a new bilateral agreement to come into force in 2012. The new agreement will allow Macau carriers to operate seven weekly flights into Tokyo from 2012, while capacity restrictions on flights to Tokyo will cease from 2013, updating the existing agreement which allowed flights to Japan without capacity restrictions, while flights to Tokyo are restricted to three weekly flights. Japan also granted fifth freedom traffic rights to all points in Japan except Tokyo and code-sharing restrictions on domestic sectors have been eliminated.

The Middle East

It was reported in February 2012 that the U.A.E General Civil Aviation Authority (GCAA) signed an air services Memorandum of Understanding (MoU) updating the existing Air Services Agreement (ASA) with the United Kingdom, reportedly granting full flexibility on the routes, capacity, number of frequencies and types of aircraft on services between the two parties, and allows for specific fifth freedom rights.

In July 2012 the U.A.E GCAA announced it had signed a MoU for updating the existing ASA with Algeria. The signed ASA is reported to allow full flexibility on routes, capacity, number of frequencies and types of aircraft, in any type of service (passenger or cargo) including the exercise of third and fourth freedoms of traffic rights. The GCAA stressed the importance of open sky agreements like this in contributing to boosting the trade, tourism and investment between UAE and partners.

USA

In the United States, the airline lobby group Airlines for America (A4A) submitted a five-step plan that provides a framework for a national airline policy to the Department of Transportation. Concerned about the future financial viability of the U.S airline sector, A4A unveiled its proposal that will have five core components: to reform the tax structure on U.S airlines and reduce the burden; to reform the airline regulatory environment; to improve infrastructure, including accelerating the implementation of NextGen technologies that are available; to enable global competitiveness, including addressing issues such as visas; and to mitigate fuel costs and volatility. This submission was in response to what A4A argues is an over-regulated environment in the U.S.

India

It was reported in September 2012 that the Indian government amended its foreign direct investment (FDI) rules to allow foreign airlines to acquire up to 49% equity in Indian carriers[95]. The decision is expected to open up new sources of capital for heavily indebted and financially stricken Indian carriers. The move was lobbied for by three Indian airlines – Kingfisher, SpiceJet and Go Air – looking to attract strategic partners. Under the new rules foreign airlines can invest in Indian scheduled and non-scheduled operators but approval will still be subject to certain restrictions, such as a rule that at least two-thirds of directors at an Indian airline must be Indian citizens.

In another announcement, the Indian government plans to set up an Essential Air Services fund to subsidise and develop low-cost airports in smaller Indian cities[96]. In an effort to encourage domestic airlines to connect to places with tourism interest, the ministry of tourism for India identified 19 such sites, mostly in places of tourist and religious interest. In providing a government fund that shares some of the initial investment for airport owners that are uncomfortable about investing in smaller cities that are unlikely to attract significant premium demand, it is hoped this initiative will reduce the risk on such investments. One reason for the poor air connectivity in India beyond the large cities is the absence of small, regional carriers able to provide a sustainable commercial service – all six domestic airlines in the country have a pan-India network and mostly operate a fleet of large jets.

7.6.1 Public Service Obligation (PSO) Provision

In order to maintain appropriate scheduled air services on routes which are vital for the economic development of the region they serve, EU Member States may impose public service obligations (PSOs) on these routes. They must respect the general principles set out in Article 16 of the Air Services Regulation 1008/2008[97].

Article 16 states that routes between airports in the Community serving a peripheral or development region or on any ‘thin routes’ qualifying for a PSO, has obligations imposed only to the extent necessary to ensure fixed standards of continuity, regularity, pricing or minimum capacity; which air carriers would not assume if they were solely considering their commercial interests. These standards must be set in a transparent and non-discriminatory way.

In the case that no air carrier is interested in operating the route on which the obligations have been imposed, the Member State concerned may restrict the access to the route to a single air carrier and compensate its operational losses resulting from the PSO. The selection of the operator must be made by public tender at Community level.

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[95] India allows foreign airline investment; ATW Online; 14/09/12 http://atwonline.com/international-aviation-regulation/news/india-allows-foreign-airline-investment-0914

[96] India to subsidize Essential Air Services to airports in smaller cities; ATW Plus; 03/10/12 http://atwonline.com/airports-amp-routes/india-subsidize-essential-air-services-airports-smaller-cities

[97] Regulation (EC) No 1008/2008 of the European Parliament and of the Council on common rules for the operation of air services in the Community (Recast), 24 September 2008

A table[98] is provided on the European Commission's website[99] that lists designated PSO routes within the European Economic Area (EAA)[100]. The table is based on data supplied by Member States and is described as a "working document" that can obtain errors and omissions. Based on the latest available table (as of 25/02/2013), there are 272 entries, some covering more than one designated PSO route and some routes not operational at the time the table was compiled. Table 7.4 shows a breakdown of these 272 PSO entries by EAA Member State.

Table 7.4: PSO Routes by EEA Member State

Country	TOTAL
France	58
Norway	42
Italy	41
Greece	31
Portugal	26
UK	21
Spain	18
Sweden	12
Ireland	7
Iceland	7
Czech Republic	3
Finland	3
Germany	3
TOTAL	**272**

Source: European Commission

PSO routes are either designated 'O' for open access to all air carriers fulfilling the PSO, or 'R' for restricted access where an exclusive concession has been granted following a call for tender as provided for in Article 16. In the case of an unsuccessful call for tenders or if an air carrier accepts to serve the route without compensation, access to the route remains open. At the end of the concession period (a maximum of four years, or five for the regions), access to the route becomes open again except if a new call for tenders has been launched. For the EEA PSO routes listed, about four fifths are restricted access and one fifth open access.

Where such routes are only commercially viable with compensation gained from an exclusive concession, once this funding is withdrawn at the end of the concession period then the air carrier will also usually withdraw from the route if it cannot make a profit. So, of the 272 entries listed in the Commission's table, 216 cover existing services (as recorded in the table at the time), the remainder being PSO routes that are now expired or repealed or where tenders to find suitable operators have not been successful.

[98] http://ec.europa.eu/transport/modes/air/internal_market/doc/pso_-_eu_and_eea_-_feb_2013.pdf

[99] http://ec.europa.eu/transport/modes/air/internal_market/pso_en.htm

[100] EEA = EU 27 plus Iceland, Liechtenstein and Norway

Lessons Learned

In September 2012, at the 35th meeting of the Australasian Transport Research Forum (ATRF) conference in Perth, a paper[101] was presented examining the lessons learned from the European PSO system. The paper sought to derive lessons and best practices from the different European experiences by viewing issues from a public transport authority perspective. The analysis presented in the paper was based on a survey of European air service procurement authorities. The derived lessons from the EU experience were discussed in the light of their use in assisting policy makers in promoting and drafting their own regional air transport programs or in further developing existing schemes such as the Remote Air Services Subsidy Scheme in Australia, which currently is centrally funded by the Australian government.

Sixteen European PSO Procuring authorities responded to the survey covering 10 different EEA States and 91 PSO routes. The survey contained questions aimed at identifying current practice and views on future developments in the following five areas:

- Output/routes, subsidies, and the justification of the programme;
- Procedural questions on the PSO programme;
- Common PSO contract specifications;
- Marketing efforts and route development aspirations; and
- Operator selection criteria and competition

Based on an analysis of the survey results, the authors of the paper drew the following main conclusions:

“It is important to make the entire PSO venture attractive to operators (incentives to grow patronage, more equitable risk sharing, removing unnecessary or outdated complications and specifications etc.). This should result in higher levels of competition, which is to be encouraged, particularly at the cross border level.

The performance of the PSO contracts should be monitored with a view to route improvement and hence eventually less public intervention and support. The authority’s understandable wish for budget certainty is perversely likely to have several unintended effects. The tender competition is likely to be reduced because of the higher risks involved. Counter intuitively asymmetry of risk results in increased subsidy because the operator will err very much on the side of price safety with regard to assumptions on fuel costs, airport charges, currency fluctuations (with the US dollar being so important in aviation) airport rentals and suchlike.

Authorities should change their perception and see that the route does not ‘belong’ to the operator but ‘belongs’ to the authority. This in effect would have substantial positive impacts on long term branding, ownership and strategy and would result in the authority retaining marketing responsibility, specifying marketing budget or fostering partnership marketing (e.g. subcontracting to economic/tourism development agencies or taking a keener interest in the winning air operator’s marketing strategy, and making this a declared part of the selection criteria). The authorities should also become more pro-active (i.e. in bringing down real and perceived entry barriers) in between tenders, as once a tender is published it is too late for talking & preparing/strategy and attracting new entrants.

[101] Efficient procurement of public air services – Lessons learned from European transport authorities’ perspectives?, Rico Merkert (Institute of Transport and Logistics Studies, The University of Sydney) and Basil O’Fee (Northpoint Aviation Services Ltd, Inverness, Scotland)

In order to increase competition there should be maximum transparency (in areas such as current subsidy levels, and details of the previous tender bids) in order to facilitate competition/level playing field and the authorities should signal openness to new aspirant operators (not just the incumbent).

An approach that has worked for railways is that authorities could own assets/aircraft and lease them to the operator, which would bring down market entry barriers. If that is not feasible, then the authorities could opt for longer PSO contracts to allow operators to achieve a sufficient return on investment. Authorities should in any case accept that they must share future price uncertainties with operators in order to improve competition for contracts as well as operators' efficiency.

Transport authorities should get the benefits of any growth on the route when retendering and allow operators to enjoy some profits/incentives for making revenue progress in the shorter term during the PSO contract period.

A consistent and more transparent framework, with an active centralised information gathering/providing European secretariat is currently missing. A better exchange of PSO success and best practice across the continent (or indeed globally) could also ensure all authorities improve their game".

7.7 Competition Issues

7.7.1 State Aid to Airlines & Airports

The European Commission (EC) acts to ensure that there is fair and open market competition throughout the EU Member States. At the same time, it recognises that the development of regional airports enhances the mobility of the general public and can provide an economic boost to the regions. The Commission ensures a level playing field in the market by setting competition rules for State aid to airports and airlines.

The air transport market has evolved significantly in recent years. Low cost carriers have gained substantial market shares with new business models linked to regional airports; also the overall level of air freight has increased over the last decade. The EC recognises that a balance needs to be found between facilitating the development of regional airports in their formative years, an open and fair competition between European airports and the airport-airline relationships in order to limit the distortions of competition and establish a level playing field.

In the context of changing market conditions, the Commission considered 2011 to be the right time to reflect on the previous application of the EU aviation guidelines from 1994[102] and 2005[103]. To this end, the EC Directorate General for Competition carried out a public consultation between April and June 2011 to measure the impact the two guidelines have had so far. The Commission received 89 replies from Member States, private citizens and various stakeholders of the aviation sector which have been published on the

[102] Application of Articles 92 and 93 of the EC Treaty and Article 61 of the EEA Agreement to State aids in the aviation sector (94/C 350/07), 10 December 1994

[103] Communication from the Commission: Community guidelines on financing of airports and start-up aid to airlines departing from regional airports (2005/C 312/01), 9 December 2005

Commission's website[104]. Following the consultation, the revision of the Guidelines is on-going and a revised set of guidelines could be expected beginning of 2014.

In terms of investigation of alleged State aid and enforcement of State aid rules with regard to airports and airlines, the following developments took place in 2012[105]:

- During 2012, the Commission adopted 37 decisions concerning the financing of airports and their interaction with airlines, passenger tax schemes, or the restructuring of airlines. About two thirds of these decisions related to regional or sectoral developments concerning airports and the other third were related to individual airlines or groups of airlines. 16 Member States were implicated in the decisions, with half the cases relating to either France or Germany.
- Of the 37 decisions, 14 related to existing cases and 23 to new cases. For the existing cases, 6 concluded that the financing did not constitute State Aid, 3 resulted in a decision to extend proceedings while the remainder related to corrigenda to the wording of previous decisions. For the new cases, 10 resulted in a decision not to raise objections while 13 resulted in a decision to initiate a formal investigation procedure. These decisions relate to over 60 on-going state aid investigations in the aviation sector.

In January 2012, the European Commission adopted the decision[106] that financing granted to Hungarian flag carrier Malév between 2007 and 2010 in the context of its privatisation and renationalisation constituted illegal state aid, as Malév would not have been able to obtain similar financing from the market on the terms conceded by the Hungarian authorities. The Commission also considered that this state aid was incompatible with the Treaty, as it was not given in the context of a coherent restructuring plan that would lead to the viability of Malév. The Commission concluded that Hungary would need to recover the incompatible aid from the beneficiary.

In March 2012, the European Commission announced that it will investigate whether financial arrangements between public authorities and the airports of Charleroi (Belgium), Angoulême (France) and Dortmund (Germany), as well as rebates and marketing agreements concluded between these airports and some of the airlines using them, were in line with EU state aid rules. The opening of proceedings was intended to provide interested third parties with an opportunity to submit comments on the measures under assessment; and it would not prejudge the outcome of the investigation.

As regards Charleroi Airport, the Commission, in 2004, had cleared part of the public support in favour of Ryanair but had required the company to reimburse the elements of state aid incompatible with EU rules. In 2008, the EU General Court concluded that the Commission had not applied the MEIP (Market Economy Investor Principles) correctly and annulled this decision. The Commission has now reopened the case in order to take this judgement into account. At the same time, the Commission has extended the scope of its investigation to possible state aid that was not covered by its original probe. This will enable the Commission to assess the situation in Charleroi on an equal footing with that in other airports currently under investigation.

[104] Consultation on review of the Community guidelines on financing of airports and start-up aid to airlines departing from regional airports [http://ec.europa.eu/competition/consultations/2011_aviation_guidelines/index_en.html]

[105] Based on entries recorded on European Commission DG Competition website

[106] Commission Decision of no SA.30584 (C 38/2010, ex NN 69/2010) on the State Aid implemented by Hungary in favour of Malév Hungarian Airlines Zrt., C92011) 9316.final, 9 Jan 2012 (also press release IP/12/7) of the same date.

Other new investigations, initiated by the Commission in 2012, related to financial arrangements at the following airports: Niederrhein-Weeze, Altenburg-Nobitz, Saarbrücken, Zweibrücken, and Lübeck-Blankensee in Germany; Klagenfurt in Austria; Alghero in Italy; Beauvais, Carcassonne, Nîmes, La Rochelle and Pau in France and Västerås in Sweden. In addition, in-depth investigations were initiated into public support measures in favour of Slovenian airline Adria Airways and Latvian airline airBaltic. The in-depth investigations will allow the Commission to assess whether the support measures constitute state aid and, if so, whether they compatible with the Treaty. During 2012, two other airline investigations concluded that restructuring aid granted to Air Malta, and Czech Airlines was in line with EU State Aid rules. In addition, the Commission found that the sale of subsidiaries of LOT Polish Airlines to the Polish State did not constitute aid. The Commission also found that financial arrangements regarding the implementation of a low cost strategy by Finavia and Airpro at Tampere-Prikkala airport in Finland and an agreement with Ryanair were in line with EU state aid rules. Similarly, in 2012, the Commission came to the same conclusion regarding the financial arrangements for the construction and operation of the new Berlin Brandenburg Airport and Terminal 2 at Munich Airport.

7.7.2 Boeing vs. Airbus WTO Ruling

Since October 2004, the EU and U.S have been contesting their Governments' respective support to their aerospace industries at the World Trade Organisation (WTO). Both WTO challenges relate to alleged WTO-incompatible support respectively to Airbus and Boeing over a twenty to thirty year period. The background to this dispute and the developments up to and including March 2012 were extensively covered in the previous edition of Annual Analyses[107].

In terms of the EU's Challenge of U.S Subsidies to Boeing ('The Boeing Case'), in March 2012, the WTO's Appellate Body rejected the U.S appeal and found that US Federal and State governments granted between US$ 5 billion and US$ 6 billion WTO-incompatible subsidies to Boeing between 1989 and 2006 with subsidies to be granted after this date estimated to be at least US$ 3.1 billion.

Following the ruling of the Appellate Body, the Dispute Settlement Body (DSB) of the WTO gave six months to the U.S to either withdraw the illegal subsidies or remove their adverse effects. On 23 September 2012, the EU received the compliance notice from the U.S and reviewed the measures presented to assess if these were sufficient to comply with WTO rules, as the U.S claimed. In the view of the EU, the lack of information in the U.S notification suggested that the U.S had neither withdrawn the illegal subsidies granted to Boeing, nor removed their adverse effects. In addition, the EU had indications that the U.S could have actually granted more illegal subsidies to Boeing in the meantime.

As a consequence, the EU felt obliged to challenge U.S non-compliance in the WTO Boeing ruling and to that end requested that the U.S enter into consultation regarding the notification it made on 23 September 2012. The request for consultations[108] was made without prejudice to the EU's right to proceed directly to a request for DSB authorisation to apply countermeasures, and this request was made on 27 September 2012[109]. The requested countermeasures amount to up to US$12 billion annually, based on estimates of

[107] Annual Analyses of the EU Air Transport Market 2011, Final Report, January 2013, Section 7.2.3

[108] United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353) – recourse to Article 21.5 of the DSU by the European Union, Request for Consultations, World Trade Organisation, 25 Sep 2012

[109] United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353) – Request by the European Union pursuant to Article 22.2 of the DSU and Articles 4.10 and 7.9 of the SCM Agreement for authorisation from the DSB to take countermeasures against the United States in an annual amount of USD 12 billion, World Trade Organisation, 27 Sep 2012

the damages suffered by the EU. At the DSB meeting on 23 October 2012, it was initially agreed that the matter be referred to arbitration, but following a request from both parties, arbitration proceedings were suspended a month later.

The DSB has authorised the establishment of a compliance panel to examine whether the U.S claim that it had withdrawn subsidies to Boeing could be sustained as requested by the EU. Taking into account the scale and complexity of the dispute, the panel expects that it will not be in a position to circulate its report until the first half of 2014.

The European demand for sanctions mirrors a U.S claim to the right to impose sanctions on the EU. Currently, there is a legal debate as to whether Boeing can widen the original 'Airbus Case' to include funding for the A350.

In a separate development, the Franco-German Airbus parent company, EADS, had to withdraw in October 2012 from a proposed merger with U.K company BAE systems, after talks were thwarted by political deadlock between the UK, French and German governments. The U.S is BAE's biggest single customer, and one of the sticking points was how to address US qualms about possible foreign government influence over BAE's involvement in classified research and development projects for the US military. The deal, had it gone ahead, would have created a European aerospace and defence giant comparable in size to Boeing.

7.7.3 Air Freight Forwarding Cartel

Action against cartels is a specific type of antitrust enforcement. A cartel is a group of similar, independent companies which join together to fix prices, to limit production or to share markets or customers between them. Instead of competing with each other, cartel members rely on each other's agreed course of action, which reduces their incentives to provide new or better products and services at competitive prices. Cartels are illegal under EU competition law and the European Commission imposes heavy fines on companies involved in a cartel.

Since cartels are illegal, they are generally highly secretive and evidence of their existence is not easy to find. The 'leniency policy' encourages companies to hand over inside evidence of cartels to the European Commission. The first company in any cartel to do so will not have to pay a fine. This results in the cartel being destabilised. In recent years, most cartels have been detected by the European Commission after one cartel member confessed and asked for leniency, though the European Commission also successfully continues to carry out its own investigations to detect cartels.

Since 2007, the Commission has been investigating allegations that several companies involved in air freight forwarding have been fixing prices by colluding on the imposition, level, timing and application of various surcharges, in breach of Article 101 of the Treaty on the Functioning of the European Union (TFEU) and Article 53 of the EEA Agreement in the freight forwarding sector. The allegations concerned four separate infringements involving the provision of freight forwarding services from the UK to the outside of the EEA, from the EEA to the U.S, from China to the EEA and from Southern China/Hong Kong to the EEA.

In February 2010, the Commission adopted a statement of objections in this case. All addressees of the statement of objections made known in writing their views on the objections raised against them and were given the opportunity to exercise their rights to be heard in an oral hearing that was held in July 2010.

Following this hearing and the subsequent investigation, it was concluded that infringements of the legislation had taken place and in 28 March 2012 the Commission adopted its Decision[110], naming the parties involved and the extent of penalties imposed. The price fixing behaviour related to four different surcharges/charging mechanisms, namely new export system (NES), advanced manifest system (AMS), currency adjustment factor (CAF) and peak season surcharge (PSS). In total, thirteen companies were fined 169 million Euros ($225 million).

7.7.4 Airline Transatlantic Joint Ventures

Air France-KLM, Alitalia and Delta

In January 2012, the European Commission opened an investigation[111] to assess whether a transatlantic joint venture between Air France-KLM, Alitalia and Delta, all members of the SkyTeam airline alliance, breaches EU antitrust rules. The goal is to ensure that this tie-up does not harm passengers on EU-U.S. routes. An opening of proceedings means that the Commission will deal with the case as a matter of priority; it does not prejudge the outcome. Simultaneously, the Commission has closed formal antitrust proceedings in relation to cooperation agreements between eight members of SkyTeam: Aeromexico, Air France, Alitalia, Continental Airlines, Czech Airlines, Delta, KLM and Korean Air Lines.

In 2009 and 2010, several members of the SkyTeam airline alliance - Air France-KLM, Alitalia and Delta - signed agreements establishing a transatlantic joint venture focusing on the routes between Europe and North America. Pursuant to these agreements, the parties fully coordinate their transatlantic operations with respect to capacity, schedules, pricing and revenue management. The parties also share profits and losses of their transatlantic flights.

This partnership represents the deepest form of cooperation within SkyTeam and aims at the alignment of the parties' commercial incentives. The Commission will investigate whether the partnership harms passengers on certain EU-U.S. routes where, in the absence of the joint venture, the parties would be providing competing services. This could be in breach of Article 101 of the Treaty on the Functioning of the EU (TFEU) that prohibits anticompetitive agreements. This latest inquiry follows similar investigations into transatlantic tie-ups by oneworld and Star Alliance. Three oneworld carriers – British Airways, American Airlines and Iberia – agreed in 2010 to offer remedies to allay Commission concerns over their revenue-sharing joint venture.

Lufthansa, United and Air Canada

In October 2012, the European Commission warned Deutsche Lufthansa AG, United Continental Holdings Inc and Air Canada that their proposed “Atlantic Plus Plus” joint venture agreement may infringe antitrust rules because it could end competition between Lufthansa and United on the Frankfurt-New York route and harm rivalry between the trio for premium passengers, that is passengers in first class, business class and flexible economy. The EU had started formally probing the accord between the members of the Star Alliance joint venture in 2009.

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[110] Summary of Commission Decision of 28 March 2012 relating to a proceeding under Article 101 of the TFEU and Article 53 of the EEA Agreement (Case COMP/39.462 – Freight-forwarding).

[111] Antitrust: Commission opens a probe into transatlantic joint venture between Air France-KLM, Alitalia and Delta and closes proceedings against eight members of SkyTeam airline alliance, IP/12/79, 27 January 2012

To allay EU concerns, the airlines have offered to make available airport slots. Thus, competitors may choose which arrival and departure slots at Frankfurt and New York airports they take up to allow as many as seven additional weekly flights on the route. This could rise to 21 weekly flights if a rival pulls out of the route. In addition, the airlines proposed to conclude fare combinability agreements and agreements ensuring access to the airlines' connecting flights at both ends of the route (in Europe and Israel, and/or in North America, the Caribbean and Central America) with competitors operating on the Frankfurt-New York route. They also proposed opening up their frequent-flyer programs to a competitor.

On 23 May 2013 the Commission adopted a decision making legally binding the commitments offered by the airlines on the Frankfurt-New York route. The commitments are for a duration of ten years. The Commission may, nonetheless, review these commitments five years after the adoption of the decision.

7.7.5 American Airlines and Sabre Antitrust Claim

In October 2012, American Airlines settled its antitrust lawsuit with global distribution services (GDS) provider Sabre. American wants more of its travel partners, such as travel agencies and websites, to connect directly to American's reservation system though a service called Direct Connect, which would save the airline booking fees. The dispute started in late 2010 when American pulled its fares off Orbitz, one of the largest travel websites, because it would not use Direct Connect. Expedia, another big travel site, then dropped American's flight information. It was claimed that Sabre joined in, making it harder to find American's fares in its system, raising booking fees and announcing that it would not renew American's contract when it expired. American said it lost $153 million in revenue during January and February 2011 as a result of the Sabre action.

Although the two parties have agreed a compromise deal, the final settlement of the case still has to be approved by the court handling the bankruptcy case of AMR Corp, the company that owns American Airlines. In addition, while the American Airlines-Sabre settlement halts their federal and state court cases, it does not stop the airline's complaints against Travelport and Orbitz Worldwide, or separate antitrust litigation brought by US Airways against the GDSs.

7.7.6 Airline Mergers and Acquisitions

While companies combining forces can expand markets and bring benefits to the economy, some combinations may reduce competition. Combining the activities of different companies may allow the companies, for example, to develop new products more efficiently or to reduce production or distribution costs. Through their increased efficiency, the market becomes more competitive and consumers benefit from higher-quality goods at fairer prices.

However, some mergers may reduce competition in a market, usually by creating or strengthening a dominant player, to such an extent that they are likely to harm consumers through higher prices, reduced choice or less innovation. Concentrations are welcome to the extent that they do not significantly impede competition but to the contrary, are capable of increasing the welfare of EU consumers, the competitiveness of European industry, improving the conditions of growth and raising the standard of living in the EU. The objective of examining proposed mergers is to prevent harmful effects on consumers. In the European Union, the European Commission has exclusive competence to review large transnational mergers meeting certain criteria. This allows companies trading in different EU Member States to obtain clearance for their mergers in Europe in one go, subject to potentially having to obtain clearance from the Commission and non-European authorities, e.g. the US Department of Justice.

IAG and bmi

In March 2012, the Commission cleared under the EU Merger Regulation the proposed acquisition of the UK airline British Midlands Limited (bmi), by the International Consolidated Airlines Group (IAG), the holding company of British Airways and Iberia. The decision[112] was conditional upon the fulfilment of commitments offered by IAG; which consist in the release of 14 daily slot pairs at London Heathrow in order to facilitate new entry on certain routes affected by the concentration, and the commitment to carry connecting passengers to feed the long-haul flights of competing airlines out of London Heathrow. In light of these commitments, the Commission concluded that the transaction would not raise competition concerns.

The remedy commitment concerning Heathrow slot release was to facilitate the prospective entrant(s) to operate up to a total of seven frequencies on the 'Identified UK City Pairs' of London-Aberdeen & Edinburgh and up to a total of five frequencies per day on any 'Identified City Pair' of London-Aberdeen, Edinburgh, Nice, Cairo, Riyadh & Moscow. Where a prospective entrant would have operated on one or more Identified City Pairs with the released slots for at least two consecutive IATA seasons, it would be entitled to apply for any slots still available in the quota for the Identified City Pairs to operate frequencies on any European short-haul city pair provided that it also continues to operate the frequencies it is operating on the Identified City Pairs.

Virgin Atlantic was successful in obtaining 9 out of the 14 available slots for the 'Identified UK City Pairs' and announced in November 2012 that it would commence flights from Heathrow to Aberdeen (3 per day) and to Edinburgh (6 per day) from 31 March 2013. Virgin Atlantic is now operating the services leasing aircraft from Aer Lingus.

Besides, on 15 March 2012, that is, already before the adoption of the decision, IAG entered into an agreement with Transaero whereby IAG transfers 2 out of the 14 available slots. This agreement is meant to ensure that Transaero would continue to be able to offer two daily frequencies on Heathrow-Moscow, as it had previously done with two daily slot pairs leased from bmi. The slot Commitment also provided that in event that Transaero would not make use of the two daily slots made available to it by IAG on the London-Moscow route, IAG would undertake to make these slots available to other prospective entrants, increasing the number of slots to be used on the Identified City Pairs from five to seven. Transaero has continued to lease these two slot pairs from IAG since the remedy transaction.

As bilateral capacity restrictions remain between the UK & Russia (a maximum of two UK designated carriers), a scarce capacity hearing was held by the UK CAA in July 2012 to decide which carrier would be allowed to use the traffic rights previously granted to bmi. There were 3 applicants from qualifying carriers: BA, easyJet and Virgin Atlantic. easyJet was the successful applicant being granted scarce capacity allocation certificates for the operation on the London-Moscow route. As easyJet announced its intention to launch services from Gatwick rather than Heathrow, it needs not apply for slots under the commitments offered by IAG. easyJet launched its twice daily Gatwick-Moscow service on 18 March 2013.

[112] Case No COMP/M.6447-IAG/bmi. Commission decision pursuant to Article 6(1)(b) in conjunction with Article 6(2) of Council Regulation No 139/2004, C(2012) 2320, 30 March 2012

TNT Express and UPS

In July 2012, the Commission opened an in-depth investigation[113] into the proposed acquisition of TNT Express of the Netherlands by the American company United Parcel Service (UPS), both major players in the small package delivery sector. The Commission's preliminary investigation indicated potential competition concerns in the markets for small parcel delivery services, in particular international express services, in numerous Member States, where the parties would have very high combined market shares.

UPS and TNT Express are two out of the only four so-called "integrators" currently operating in Europe. Integrators are companies that control a comprehensive air and road small package delivery network throughout Europe and beyond and are capable of offering the broadest portfolio of such services. The other integrators present in Europe are DHL, which is owned by Deutsche Post, and FedEx, a US-based company.

Following the in-depth investigation, the Commission reached the decision in January 2013[114] to prohibit the proposed acquisition. The Commission found that the take-over would have restricted competition in 15 Member States when it comes to the express delivery of small packages to another European country. In these Member States, the acquisition would have reduced the number of significant players to only 3 or 2, leaving sometimes DHL as the only alternative to UPS. The concentration would therefore have likely harmed customers by causing price increases. During the investigation, UPS offered to divest TNT's subsidiaries in these 15 countries and allow the buyer to access its intra-European air network for five years. The Commission carried out an in-depth assessment, including two market tests where customers and other interested parties were consulted. However, it was concluded that the remedies proposed by UPS would prove inadequate to address the identified competition concerns.

Ryanair and Aer Lingus

In August 2012, the European Commission opened an in-depth investigation[115] (phase II) under the EU Merger Regulation into the proposed acquisition of Aer Lingus by the low cost carrier Ryanair. Both are major players in the Irish passenger air transport services market.

Aer Lingus is a publicly listed Irish-based airline. It offers essentially point-to-point scheduled air transport services. In the IATA Summer Season 2012, it operated on 108 routes, across Ireland, the United Kingdom, continental Europe, and the United States of America, with 45 aircraft. Its main base is located at Dublin airport. It carried 10.4 million passengers in 2011.

Ryanair is a low-fares airline operating point-to-point scheduled air services essentially in Europe. The company has a fleet of 294 aircraft and 51 bases across Europe. Dublin is one of the biggest bases of Ryanair. In the year ended March 2012, Ryanair carried around 75.8 million passengers.

[113] Commission opens in-depth investigation into proposed acquisition of TNT Express by UPS, Press Release IP/12/816, 20 July 2012

[114] Commission blocks proposed acquisition of TNT Express by UPS, Press Release IP/13/68, 30 Jan 2013

[115] Commission opens in-depth investigation into proposed acquisition of Aer Lingus by Ryanair, Press Release IP/12/921, 29 August 2012

Ryanair already owns 29.82% of Aer Lingus. This minority shareholding is currently under review by the UK Competition Commission, in particular as to its effects on competition between Ryanair and Aer Lingus on routes between Ireland and the United Kingdom.

The Commission prohibited the first attempt by Ryanair to take over Aer Lingus in its decision COMP/M.4439 *Ryanair/Aer Lingus* of 27 June 2007. This decision was upheld by the General Court of the European Union by its judgement T-342/07 handed down on 6 July 2010. The second attempt by Ryanair to take over Aer Lingus was notified to the Commission on 8 January 2009 but was subsequently withdrawn.

The Commission's in-depth investigation into this third attempt at a takeover, which took the form of a public offer, indicated that the transaction would have led to a significant impediment to effective competition. Ryanair and Aer Lingus are the main operators out of Dublin airport. In comparison with the situation in 2007, when the Commission adopted its first decision, the number of routes where both Ryanair and Aer Lingus operate has increased. On a large number of European routes, mainly out of Ireland, the two airlines are each other's closest competitors and barriers to entry appear to be high. Many of these routes are currently only served by the two airlines. The takeover could therefore lead to the elimination of actual and potential competition on a large number of these routes.

The Commission decided in February 2013[116] to block the proposed acquisition of Aer Lingus by Ryanair. In summary, the findings of the investigation were as follows:

- Since the first decision in 2007, the number of air transport routes where Aer Lingus and Ryanair compete directly against each other has increased from 35 to 46.
- On these 46 routes, the Commission found that the acquisition raised very significant competition concerns, since it would have eliminated Ryanair's strongest competitor. These routes cover flights to and from Dublin, Cork, Knock and Shannon, which are used by more than 11 million passengers each year.
- On 28 of these routes the merger would have simply led to a monopoly.
- On the other routes the only competitive constraint would have been exercised by airlines with a different business model, such as charter airlines or large scheduled airlines that focus on connecting flights and this constraint would have been too weak.

Ryanair made proposals to try to remedy these concerns but, following a detailed investigation, the Commission’s conclusion was that these remedies were not sufficient given the seriousness of the competition problems at stake. The investigation included three successive market tests, gathering views from competitors, customers, travel agents, consumer associations, public authorities and airport operators.

Ryanair had proposed to divest a stand-alone business comprising most of Aer Lingus' present operations on 43 routes on which the Commission identified competition concerns. This business would have been given to Flybe, along with capital. However, the Commission was not convinced that Flybe would have the experience and the ability to maintain and develop this business as a viable and active force, capable of competing with Ryanair. It felt it was unlikely that Flybe would have operated these routes on a lasting basis.

[116] Commission prohibits Ryanair’s proposed takeover of Aer Lingus, Press Release IP/13/167, 27 Feb 2013

On 3 routes between Irish airports and London, Ryanair also proposed to lease slots to London Gatwick for 3 years to British Airways. However this remedy was not felt sufficient to address the creation of a dominant position on these routes. In addition, it could not be excluded that British Airways would have exited the 3 routes or scaled back its operations at the end of the 3 year period.

Although Ryanair made proposals covering each of the relevant routes, these proposals did not alleviate the Commission's concerns, because they fell short of addressing the fundamental problem posed by the transaction: the creation of a monopoly or a dominant position on these 46 routes.

7.7.7 United Technologies acquisition of Goodrich

In March 2012, the European Commission opened an in-depth investigation[117] under the EU Merger Regulation into the proposed acquisition of control over Goodrich Corporation by United Technology Corporation (UTC), both US-based companies active in the production and sale of aviation equipment on a worldwide basis. .

UTC is active in the production of a broad range of high-technology products and support services for the building systems and aerospace industries worldwide. The UTC group comprises a number of major business units such as Carrier heating and air conditioning; Otis elevators; UTC Fire & Security systems and UTC Power fuel cells. Three businesses are particularly relevant for the current transaction: Hamilton Sundstrand aerospace systems and industrial products; Pratt & Whitney aircraft engines; and Sikorsky helicopters.

Goodrich is active in the production and sale of systems and services to the aerospace, defence and security industries on a worldwide basis. Goodrich has activities in three main business areas: actuation and landing systems; nacelles and interior systems; and electronic systems.

The Commission's preliminary investigation indicated potential competition concerns regarding the markets for engine controls and AC power generators, where the parties would have very high combined market shares. The Commission also had vertical concerns concerning the removal of Goodrich as an independent supplier of fuel nozzles and engine controls, as well as in the area of aftermarket services.

However, following an in-depth investigation, the Commission cleared the proposed acquisition[118]. The approval was conditional upon the divestment of Goodrich's businesses in electrical power generation (AC) and in engine controls for small engines. It was also subject to Rolls Royce being granted an option to acquire Goodrich's lean burn fuel nozzle R&D project.

Following regulatory sign-offs from European, U.S. and Canadian authorities, UTC acquired Goodrich on 26 July 2012 for a purchase price of US$16.5 billion, in one of the largest transactions in the aerospace industry in recent years.

[117] Commission opens in-depth investigation into proposed acquisition of control over Goodrich by United Technology in aviation equipment sector, IP/12/308, 27 March 2012

[118] Commission approves acquisition of aviation equipment company Goodrich by rival United Technologies, subject to conditions, IP/12/958, 26 July 2012

8. Environmental Development & Sustainability

8.1 Introduction

Air transport has helped to bring global communities closer together. The benefits of the aviation industry are well defined by its contribution to economic and social development. From the goods we send, to the people and places we visit, air travel has shaped the quality of modern life and heightened awareness of our global society.

However, this progress has not been without cost to the environment. The broad target for the air transport industry is, along with every other global industry, to reduce its greenhouse gas (GHG) emissions. The core principles of sustainability are at the forefront of every airport master plan, airline business model and air traffic management vision. As international pressure mounts for the aviation industry to develop ever more efficient technology and means of operation, this chapter provides an overview of the key issues facing the industry in 2012 in an environmental context.

The chapter begins a look at industry organisation ICAO's progress at the Rio+20 Conference and its release of a position paper. Updates on initiatives such as AIRE and ASPIRE are provided, followed by environmental achievements at airports in Europe and across the globe, highlighting programmes such as ACI Europe's Airport Carbon Accreditation scheme.

Noise related developments are noted, along with progress on aircraft design and examining what aircraft manufacturers have achieved. Airline initiatives are explored, charting progress on environmental developments throughout 2012, followed by airspace and ATM issues. The chapter concludes with a focus on sustainable alternative fuel developments, solar-power and finally a summary of progress on aviation's inclusion into the EU Emissions Trading Scheme.

8.2 ICAO developments

In June 2012, Rio de Janeiro hosted the United Nations conference on sustainable development (UNCSD), the Rio +20 conference.

ICAO was an active participant at this event and showcased some of the developments that aviation as an industry has achieved and is aspiring to achieve. Indeed, ICAO marked the event by laying on a landmark series of connecting commercial flights powered by sustainable alternative fuels starting in Montreal and finishing the journey in Rio, carrying the ICAO Secretary General, other dignitaries, media and ordinary passengers.

This ICAO initiative was termed 'Flightpath to a Sustainable Future', and featured contributions from myriad parties across the aviation industry. Across the entire journey from Montreal to Rio, the CO_2 saving was calculated to be 47 tonnes, equivalent to a 20% reduction. The journey was divided into four sectors, summarised in the following table:

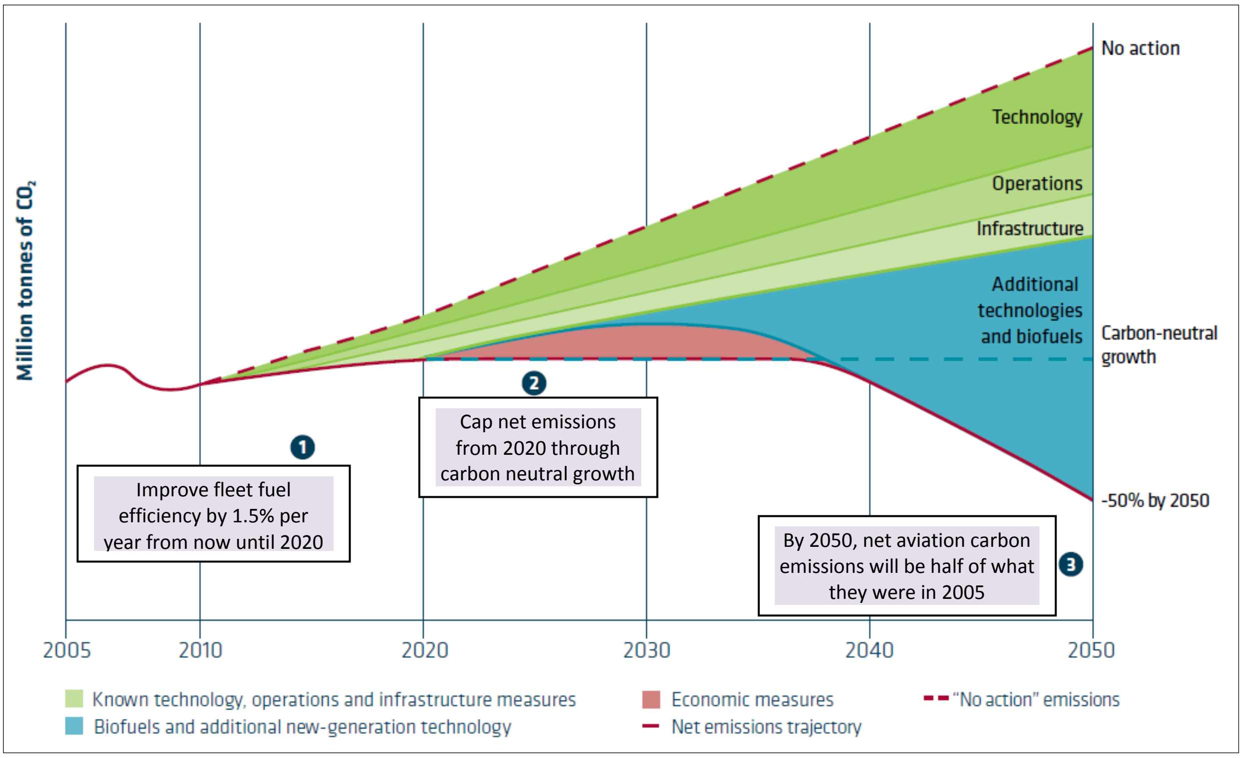
Leg	Airline	Aircraft	Route length (km)	Biofuel blend
Montreal – Toronto	Porter Airlines	Bombardier Q400	494	Camelina
Toronto – Mexico City	Air Canada	Airbus A319	3,243	Used cooking oil
Mexico City – Sao Paulo	Aeromexico	Boeing B777	7,423	Used cooking oil, jatropha and camelina
Sao Paulo – Rio de Janeiro	GOL	Boeing B737-800	366	Inedible corn oil and used cooking oil

At the conference ICAO noted that to June 2012, there were more than 300 biofuels initiatives underway worldwide, with a number of airlines using alternative fuels for commercial flights. However, ICAO warned that these sustainable alternatives are still a long way from being commercially viable and available in suitable quantities, and asked States to ensure that effective policies are established to incentivise further development.

In its November 2012 position paper, "A Sustainable Flightpath Towards Reducing Emissions", ICAO reaffirmed the industry's commitment to achieve a pathway to carbon-neutral growth. The organisation recognised that to achieve the targets the industry has set itself requires a multi-faceted approach and commitment from all stakeholders.

Achieving emissions reductions will focus on the four pillars of Technology, Operations, Infrastructure and Economic Measures. The aviation industry's commitments are mapped out, as shown in Figure 8.1.

Figure 8.1: Mapping out the industry commitments



Source: ICAO

8.3 The Atlantic Interoperability Initiative to Reduce Emissions (AIRE)

The SESAR Joint Undertaking collaborates with the US Federal Aviation Administration (FAA) and a number of European and North American partners in an international programme for the reduction of aircraft emissions (AIRE - Atlantic Interoperability Initiative to Reduce Emissions). On the European side alone this project has realised more than 6,000 trials in real operational conditions since 2009. Many of the solutions validated in AIRE are in operations today or will be shortly.

AIRE is a programme designed to improve energy efficiency and lower engine emissions and aircraft noise in cooperation with the FAA. The SESAR JU is responsible for its management from a European perspective.

In AIRE, trials for all phases of flight are conducted. Some projects perform several optimisations in a “gate to gate” perspective. Trials cover surface ground movements; departure and arrival management; en route or oceanic optimisation.

The programme has been running since 2009. In 2012, a particular achievement worth noting was the expansion of the programme to the South Atlantic, as well as its enlargement – 31 partners are part of AIRE 3 family (with 15 new comers) in 14 locations.

AIRE 3 Cycle: 2012-2014

In 2012, nine new projects were selected as part of the AIRE 3 cycle taking place from 2012 to 2014.

- **Terminal Area (TMA):**

  Four of the current AIRE projects address TMA optimisations: In Hungary, REACT-Plus, will test the implementation of Continuous Descent Approaches (CDA) and Continuous Climb Departures (CCD) at and from Budapest airport, respectively. The implementation of CDAs and CCDs will be based on the operational introduction of a new ATM tool to be used by the ATCOs that will provide simple and intuitive distance to go information and separation alerts between aircrafts to controllers.

  The project, “CO2 and Noise Approach Reduction for International Aviation Sustainability” - CANARIAS will demonstrate the real value of PBN in complex airspace. The project will design and validate precision Required Navigation Performance (RNP-AR) approaches at Lanzarote and La Palma airports. AMBER has similar objectives but for Latvia airport.

  The OPTA-IN project will consist on the validation of Continuous Decent Operations (CDOs) in Palma de Mallorca. CDOs will be implemented without doing major changes in instrument flight procedures.

- **Oceanic:**

  Four new projects integrate the AIRE 2012/2014 cycle for oceanic and en-route optimisations – ENGAGE Phase II is the continuation of the eponym AIRE 2 project to continue the work towards full implementation of the concept in the North Atlantic. SMART - Shared Monitoring Alert and Reaction Tracking - will focus on the optimisation of oceanic flights (Lisbon FIR and Santa Maria FIR) by seeking the most economical route under actual meteorological conditions through the integration of various flight plans, position and meteorological data between the ATM system and Airline AOCs. Based on updated weather information, NAV Portugal will offer vertical and lateral optimisation using a new interface that the project will develop for global information sharing and exchange. This will enable better planning and hence more efficient operating profiles. SATISFIED (SAT Improved uSe of Flight corrIdor for Emissions reDuction) will allow participating airlines to plan flexible routes through the EUR-SAM corridor using RNP4 equipped aircrafts flying flex routes in that corridor. The WE-FREE project - Week End Free Route for Environmental Efficiency - aims at performing demonstration flight trials of Free Route optimization in France, Italy and Switzerland during weekends.

- **Full Gate to Gate flights:**

In AIRE 3 the project MAGGO - Multiple Atlantic Gate to Gate Optimizations - addresses numerous Air Traffic Services improvements in implementation during 2012 and 2013, in a coordinated improvement programme affecting the Santa Maria FIR, the Santa Maria TMA and several Azores airports. Full gate to gate operations between Lisbon and the Azores, taking advantage of the benefit of FANS/1/A ADS-C and CPDLC capability combined with the benefits of PBN and RNP4 capabilities and User Preferred Routes (UPR) supported by Dynamic Air Route Planning (DARP), will be carried out.

8.4 The ASPIRE Project

In February 2008, a multilateral partnership known as the ‘Asia and Pacific Initiative to Reduce Emissions’ (ASPIRE) was created in Singapore. The first air navigation service providers (ANSPs) to sign the ASPIRE joint statement were Airservices Australia, Airways New Zealand (Airways) and the US FAA. Since the group’s inception ANSP membership was expanded to include the Civil Aviation Bureau of Japan (JCAB), the Civil Aviation Authority of Singapore (CAAS) and the Aeronautical Radio of Thailand Limited (AEROTHAI).

Working closely with airline partners and other stakeholders in the region, ASPIRE’s objective is to accelerate the development and implementation of operational procedures to reduce the environmental impact for all phases of flight on an operation by operation basis, from gate to gate.

Developments in 2012

Airways introduced a tool named OSYRIS™CFM, a joint venture between Barco Orthogon GmbH and Airways, where the Barco AMAN Decision Support tool was joined with Airways’ CAM (Collaborative Arrivals Manager) Demand Management tool to provide a complete ground-air-ground-air traffic enabling solution. It is estimated that from the first quarter of 2013, international flights arriving into Auckland will benefit from the OSYRIS™CFM tool, helping to optimise traffic management and routing. The tool optimises the best arrival option prior to departure, and uniquely considers factors such as type, equipage and capability, approaches available and weather conditions when making its recommendation. This is delivered electronically to the aircraft data block for ATC voice transmission to each aircraft.

JCAB implemented the UPR (User Preferred Route) trial into the Pacific organised track system that connects Japan and North America (PACOTS). Flights connecting three Japanese airports and six Oceania airports have reportedly benefited from a UPR trial operation aiming to reduce fuel burn by filing more efficient routings.

CAAS implemented Continuous Descent Operations (CDO) for all arrivals into Singapore Changi Airport, as of March 2012. It is estimated that this enhancement could yield potential fuel savings of 1.5 million kg of fuel annually for airlines, equivalent to about 4.7 million kg of carbon emissions and a contribution of SGD$1.7 million savings in fuel costs.

Airservices Australia is also pursuing a detailed programme of works to implement CDM solutions, building on Stage 1 of its programme when it replaced the central traffic management system with an advanced Air Traffic Flow Management (ATFM) application capable of simultaneously managing traffic flows at multiple airports, commonly referred to as Metron. Metron was implemented for traffic flows into Sydney and Perth airports in early 2012 and is planned at Brisbane and Melbourne.

The Civil Air Navigation Service Organisation (CANSO), representing ANSP interests worldwide, introduced the CDM city pair concept to maximise the predictability and efficiency of flights between major city pairs. A pilot “Bangkok-Singapore CDM Project” was launched in June 2011 with partners AEROTHAI and CAAS. Operational trials to validate the concept were held over a 2 week period in 2012 to obtain feedback and flight data. Two examples of benefits that resulted from the trial are as follows;

- Although a flight from Bangkok to Singapore had departed 30 minutes late, the airport operator in Singapore was able to make use of the flight’s up-to-date arrival time in Changi to better resource manage their ground handlers and airport operators. There was no requirement to allocate a new gate to the arriving flight. With improved predictability the airline could also reduce its built-in time buffer for the arriving flight.
- By having knowledge of the Target Off-Block Time (TOBT) of airlines, ATC Ground Controllers in Changi Tower were able to better plan the push-back sequences of aircraft at departure gates and minimise the flights’ departure delay.

8.5 Airports

8.5.1 Airport Carbon Accreditation

ACI Europe developed its ‘Airport Carbon Accreditation’ initiative to assess and recognise airport efforts to manage and reduce GHG emissions. It was launched in 2009 in Europe, and in late 2011 the scheme was rolled out to the Asia Pacific region in cooperation with ACI Asia Pacific, having already achieved significant results with this programme in Europe.

Over the course of ‘Year 3’, which ended in May 2012, Airport Carbon Accreditation has built on the successes of its accredited airports, with a total of 59 European airports now accredited representing 52.8% of European air traffic, or over 780 million passengers.

Also, Year 3 was marked by the accreditation of the first four airports in the Asia-Pacific Region of ACI. Representing over 100 million passengers at these four sites alone, 6% of the Asia-Pacific region’s traffic is already passing through Airport Carbon Accredited airports.

Altogether, these accreditations represent 17% of worldwide passenger traffic.

Olivier Jankovec, Director General, ACI EUROPE made an announcement in the 2011-2012 Annual Report[119]:

> *"Year Three of Airport Carbon Accreditation has seen several landmark moments which have really demonstrated the value of the programme. We now have 59 airports in Europe, welcoming nearly 800 million passengers each year. Our expansion to Asia-Pacific is already an ambitious first step, which we hope will ultimately lead to the programme becoming available to airports worldwide at some point. The fact that we have secured ICAO's support is a real vindication of the hard work that has gone into Airport Carbon Accreditation and the global reach we are striving for. This past year has seen us achieve a total reduction of 414,128 tonnes of CO2. For the year ahead, the pursuit of new efficiencies will continue and various airport groups now have significant strategies to address their CO2 emissions in increasingly innovative ways. We look forward to sharing the latest developments with you, as they happen."*

The initiative recognises that airports are at different stages in the process of carbon management and has therefore defined a stepped approach to accreditation, with the ultimate goal being carbon neutrality. The four levels of **Mapping**, **Reduction**, **Optimisation** and **Neutrality** provides a common framework for airports. Figure 8.2 outlines the aggregated carbon dioxide emissions footprint and reduction from all participating airports.

[119] Airport Carbon Accreditation; Annual Report 2011-2012; ACI Europe; June 2012

Figure 8.2: Aggregated emissions and data from all Airport Carbon Accreditation participants

Variable	2010-2011		2011-2012	
	Emissions	Number of Airports	Emissions	Number of Airports
TOTAL SCOPE 1 AND 2 EMISSIONS				
Aggregate carbon footprint for 'year 0'[1] for emissions under airports' direct control (all airports)	2,275,469 tCO_2	43	2,514,947 tCO_2	59
Carbon footprint per passenger	3.73 $kgCO_2$		3.22 $kgCO_2$	
SCOPE 1 AND 2 EMISSIONS REDUCTION[2]				
Aggregate reduction in emissions from sources under airports' direct control (Level 2 and above)	51,819 tCO_2	23	48.676 tCO_2	36
Carbon footprint per passenger	0.11 $kgCO_2$		0.08 $kgCO_2$	
TOTAL SCOPE 3 EMISSIONS[3]				
Total carbon footprint for 'year 0' for emissions sources which an airport may guide or influence (level 3 and above)	6,643,266 tCO_2	13	8,299,743 tCO_2	18
SCOPE 3 EMISSIONS REDUCTION				
Aggregate reductions from emissions sources which an airport may guide or influence	675,124 tCO_2	10	365,528 tCO_2	18
TOTAL EMISSIONS OFFSET				
Total emissions offset (Level 3+)	85,602 tCO_2	8	79,964 tCO_2	10

Source: Airport Carbon Accreditation; Annual Report 2011-2012;; ACI Europe, June 2012

1. 'Year 0' refers to the 12 month period for which an individual airport's carbon footprint refers to, which according to the Airport Carbon Accreditation requirements must have been within 12 months of the application date.

2. This figure includes increases in emissions at airports that have used a relative emissions benchmark in order to demonstrate a reduction.

3. These emissions sources are those detailed in the guidance document, plus any other sources that an airport may wish to include.

The following are just some examples of European airport developments under this initiative.

Eindhoven Airport

Eindhoven Airport in the Netherlands upgraded its accreditation to 'Level 2: Reduction' during 2011-2012. This was achieved through the development of its Carbon Management Plan, under which several measures were introduced to minimize and monitor energy usage at Eindhoven Airport. The energy reduction initiatives within the airport contributed to a relative reduction of 14% in CO_2 emissions per passenger in 2010 compared to 2009.

Geneva Airport

Geneva Airport in Switzerland was accredited at 'Level 3: Optimisation' in year 3 of the initiative (2011-2012). The airport demonstrated active engagement with stakeholders. The airport's Employee Mobility Plan encouraged the use of alternative modes of transportation, such as providing subsidies for those using public transport. This programme appreciably increased the percentage of employees using sustainable modes of transportation for commuting, thus reducing the Airport's carbon footprint.

Athens Airport

Athens International Airport in Greece achieved 'Level 2: Reduction' in 2010 but in Year 3 was making strides towards attaining 'Level 3: Optimisation' by increasing its stakeholder engagement efforts. Following implementation of a pilot 5 kWp photovoltaic installation at the airport's train station in 2004, Athens invested heavily in solar power, constructing an 8.05 MWp Photovoltaic Park (PV Park), operational since July 2011. The PV Park is designed to produce enough clean energy to cover 20% of the company's needs, corresponding to 10% of the entire airport community's needs.

Milan Airports

The Milan airports of Malpensa and Linate retained 'Level 3+: Neutrality' in 2011-2012. With both airports having demonstrated a continuous reduction cycle in their CO_2 emissions each year for the last six years, stakeholder engagement has been critical to achieving this. Linate Airport saw its CO_2 emissions reduce by 25% between 2006 and 2011. Malpensa Airport achieved even greater reductions, with CO_2 emissions cut by 60% in the same time period.

Dublin Airport Authority

In February 2012, Dublin Airport Authority's (DAA) three Irish airports of Dublin, Cork and Shannon announced results of their emissions reduction programme as part of its inclusion in the Airport Carbon Accreditation initiative. The carbon footprint of the three airports was mapped and a combined reduction in CO_2 of about 3,500 tonnes was recorded at Dublin and Cork airports between 2009 and 2010.

UK airports

In August 2012, East Midlands and Bournemouth Airports in the UK announced their 'carbon neutrality' in ground operations. The airports reduced their carbon emissions by a total of 7,171 tonnes in 2011 through energy reduction and the introduction of renewable energy, achieving carbon neutral operations. M.A.G, owners of the two airports alongside Manchester, has stated that its largest airport is also on course to achieve its carbon neutral target, by 2015. Manchester Airport invested £2 million in 2011/12 on a range of initiatives, resulting in a total carbon saving of 12,500 tonnes per year.

8.5.2 Airport Emission Reductions outside Europe

In 2011-2012, Abu Dhabi International Airport in the U.A.E. became the first ACI Asia-Pacific member airport to achieve 'Level 1: Mapping' accreditation as part of ACI's initiative to roll out its Airport Carbon Accreditation programme universally. The airport developed its carbon footprint by collecting and assessing data, and mapped out a strategy to use energy in more efficient ways.

Joining Abu Dhabi in 2012 were three other ACI Asia-Pacific airports – Singapore Changi Airport, Mumbai Chatrapati Shivaji Airport (both 'Level 1: Mapping') and Bangalore Bengaluru Airport ('Level 2: Reduction') – in recognition of efforts to mitigate their environmental impact.

Salt Lake City Airport, in Utah USA, began a US$1.8 billion redevelopment programme in 2012. At the heart of the upgrade are the core environmental principles of improved energy efficiency and green design. Incorporated in the redevelopment will be approaches like the re-use of water, photovoltaic power sources, built-in design solar elements and recycled materials[120].

Staying in the USA, Tampa Airport in Florida unveiled the State's first public, airport-based natural gas fuel station to coincide with the airport's decision to convert more than half of its ground vehicles to more environmentally friendly fuels by 2017[121].

Phoenix Sky Harbour International Airport in Arizona, USA, inaugurated its new rooftop solar system that is expected to generate up to US$4.7 million in electricity costs savings over the next two decades. The 5.4 megawatt high efficiency solar power system is estimated to generate the equivalent of 51% of the electricity demand at the airport's rental car centre, two parking garages and a toll plaza.

Canberra Airport, Australia, completed construction of its new Western Concourse Terminal, the final phase in the A$450 million transformation of the airport. The redevelopment has been undertaken with environmental principles in mind, with two tri-generation plants producing electricity, heating and cooling to allow the new terminal to cut CO_2 emissions by up to 75% compared to conventional buildings. The new terminal also uses low emission lighting, energy-efficient climate control that favours 'smart' drift instead of fixed temperatures, double glazed 12mm thick glass windows and water-saving measures that allows the terminal to use 20-30% less potable water than conventional buildings[122].

At Hong Kong International Airport, energy saving initiatives are continuously being targeted and achieved. Some of the measures introduced in 2012 include: the phased replacement of traditional lighting in the terminal buildings with 100,000 LEDs; the replacement of 40 travelators at Terminal 1 with dual-speed type; integrate the cooling systems in Terminal 1 and Ground Transportation Centre to utilise seawater chilling units of various sizes in a more efficient way; test various types of films to improve thermal insulation of façade glazing.

[120] Airport World; February-March 2012 edition

[121] Airport World: April-May 2012 edition

[122] Airport World; October-November 2012 edition

8.5.3 Global airport noise-related developments in 2012

In Australia, the New South Wales government approved the rezoning of a housing development to allow 2,000 new homes in a venture which is directly under the Canberra Airport flight path. The original proposal had been cut in size by 20%. Houses will be required to have noise insulation installed and prospective buyers must be notified about the potential for aircraft noise. Opponents of the housing development warn that placing houses directly under the flight path will constrain growth and expansion options for Canberra Airport. Since there is no curfew at the airport, residents under the flight path would be affected by aircraft noise throughout the day and night.

In April, the State Government of North Rhine-Westphalia imposed a night flight ban on passenger aircraft at Cologne-Bonn Airport, Germany, between the hours of midnight and 05:00. Cargo aircraft will still be allowed to arrive and depart during this time and delayed passenger flights would be permitted to land until 03:00. The decision is pending an appeal by the airport to the Federal Minister of Transport.

Vienna's municipal government has declared its support for the planned third runway at the Austrian capital's airport, but has demanded better noise protection for affected communities. The decision comes after the regional government of Lower Austria – the authority primarily responsible for the expansion project – gave its approval in July after assessing its environmental impact.

In the UK in June 2012, a new code of practice was launched to minimise emissions, improve air quality and reduce noise from aircraft departing UK airports. A Departures & Ground Operations Code of Practice Working Group, comprising airlines, airports, manufacturers, the CAA and air traffic control, worked for the past five years to develop the Code. The code is based on four key initiatives:

- Use of airport terminal-based power and pre-conditioned air sources or mobile ground power rather than the aircraft's auxiliary power unit (APU) when aircraft are on stand. APUs are noisier and use around six times more fuel than ground units.

- Taxiing without using all the engines which can save up to 40% in ground level fuel burn and associated CO_2 emissions, and up to 30% in NO_x emissions.

- Taking off on a continuous climb, rather than stepped climb, to cruise level; avoiding steps saves an average of 6% in climb fuel.

- Introduction of Airport Collaborative Decision Making at all major airports bringing together all live operational data to streamline decision making; this can save at least two minutes on taxi times.

The Departures Code follows the success of an equivalent Arrivals Code of Practice which was introduced in the UK in 2004. One of its key initiatives was the use of continuous, rather than stepped, descent to landing, a procedure which is now in use worldwide and considered best environmental practice.

In December 2012, London Heathrow Airport in the UK began a five-month trial to see if creating noise relief zones for communities under the flight path can ease noise disturbances. The 'Early Morning Noise Respite' trial aims to explore whether flights – particularly at the beginning of their approach into Heathrow – can be routed in a more defined, predictable way to benefit residents living below. On average, about 17 flights arrive at Heathrow each morning between 04:30 and 06:00 and their flight paths have no set route. Two noise relief zones have been defined for each approach direction that will be active sequentially week by week. Pilots will be directed by ATC to avoid flying through whichever zone is active for that particular week.

Also in December 2012, it was reported that the European Parliament had approved European Commission proposals to create a common European approach to setting anti-noise restrictions, which will, among other measures, make it easier for airports to phase out the oldest, noisiest aircraft. The noise proposals were forwarded to the European Council of member-state government ministers for discussion.

8.6 Aircraft design and manufacturer developments

In early 2012 easyJet released the initial results of a trial that tested the application of a ‘smooth paint’ to aircraft exteriors. This ultra-thin layer of paint, produced by tripleO, has the effect of increasing aerodynamics and reducing drag. The easyJet trial was carried out in 2011 when the airline outfitted 8 of its aircraft with the paint, which is a type of poly-filler working on a microscopic level to reduce the uneven surface of typical aircraft paint. The overall coating is 1 micron thick, 100 times thinner than a hair’s breadth, and adds only 4oz of weight to each of easyJet’s aircraft. The trial resulted in reduced drag and improved fuel efficiency of between 1-2%. easyJet has indicated it could apply the paint to all its planes subject on the results of a 12-month trial period to establish the extent to which the paint saves carbon emissions.

It was reported in February 2012 that engineers in the UK discovered a method to design aircraft that are able to generate electricity by harnessing energy from the landing gear. The energy produced by an aircraft’s braking system during landing, currently wasted as heat produced by friction in the brakes, would be captured and converted into electricity by motor-generators built into the landing gear. This electricity would be used to power the plane as it taxis to and from airport gates, reducing the need to use the jet engines, saving on aviation fuel, cutting emissions and reducing noise pollution at airports. For ACARE (The Advisory Council for Aeronautics Research), implementing such engineless taxiing procedures is a prime post-2020 European airport goal.

At the sixth ATAG Aviation and Environment Summit, in Geneva in March 2012, Airbus underlined its commitment towards sustainable aviation growth. As a leading aircraft manufacturer Airbus is in pursuit of the perfect flight and believes that its scale-up can start today to shrink the environmental footprint of an aircraft’s flight to a minimum. Airbus asserts that this can be achieved through the combination of all best practises currently available such as operating the most eco-efficient aircraft, using sustainable alternative fuels and implementing a streamlined ATM system. The manufacturers’ assertion is based on practical trials, such as the 2011 Airbus and Air France “perfect flight” performance, where all the above mentioned factors where leveraged on a regular A321 commercial flight from Toulouse to Paris, cutting CO_2 emissions by half.

In September 2012, Boeing and American Airlines showcased a Next-Generation B737-800 aircraft known as ecoDemonstrator in Washington, D.C., to highlight testing of environmentally progressive technologies and to demonstrate innovation and collaboration among industry and government. This followed a series of test flights designed to accelerate advanced technologies that increase fuel efficiency and reduce noise. American Airlines has loaned a new Next-Generation 737-800 to Boeing to serve as the prototype for these advanced technologies, which include variable area fan nozzles, active engine vibration reduction and a regenerative fuel cell. The 2012 ecoDemonstrator is the first of several test platforms. Boeing plans to have one per year, with each airplane testing a new set of technologies. In 2013, a wide-bodied airplane will serve as the testbed.

Canadian aircraft manufacturer Bombardier has declared that its 70+ seat Q400 NextGen turboprop produces 30-40% fewer CO_2 emissions on routes where it has replaced similar capacity jet aircraft, equivalent to 6k-8k fewer tonnes of CO_2 emissions every year for each Q400 aircraft. The manufacturer also claims that the aircraft's noise footprint at 70dba is 2.5 times smaller than a similar capacity jet.

8.7 Airline Initiatives

In February 2012, UK low cost carrier easyJet announced its collaboration with Honeywell and Safran to support the development and trial of a new electric green taxiing system (EGTS). The EGTS allows aircraft to taxi without requiring the use of aircraft engines by using the Auxiliary Power Unit (APU) generator to power motors in the main wheels. Due to the high frequency and short sector lengths of easyJet's operations, around 4% of total fuel consumed annually is used when the airline's aircraft are taxiing. easyJet's fleet average 20 minutes of taxi time per flight – the equivalent of 3.5 million miles a year. The development and trial will help establish whether the estimated savings can be realised and also quantify other benefits.

Also in February 2012, British Airways announced that it saved enough fuel to power 550 flights from Heathrow to New York in 2011 following the introduction of an online suggestion box for staff, where employees were invited to submit ideas on how the airline could further reduce emissions. According to the airline, some of the more unusual suggestions included replacing in-flight glass with plastic wine bottles, reducing the amount of water carried in aircraft water tanks and the descaling of toilet pipes on the Boeing 747 and 777 fleets. This reportedly saved £600,000 as a result of reduced weight, and also improved the performance of the toilets. British Airways is already working on more projects to save fuel in 2012, including the use of new, lightweight catering trolleys, headsets and cargo containers.

In March 2012, Chile's LAN Airlines operated its first commercial flight using second-generation biofuels. An Airbus A320 flew from Chile's Santiago to Concepción on 7 March, the result of a year-long preparation by LAN and partner Air BP Copec. The biofuel was made from used, refined vegetable oil.

Airberlin, the German airline, reported in April 2012 that it has been developing noise reducing technology with its Boeing fleet at Innsbruck Airport, Austria. The Required Navigation Performance approaches (RNP-AR) project is part of Complex Heterogeneous Air Traffic (HETEREX), a joint research project aiming to create conditions for curved approaches, take-off and landings. Curving the flight path makes the route more efficient thereby using less fuel, and also can avoid heavily populated areas, reducing emissions and noise over public places.

In May 2012, Spanish flag carrier Iberia reported that it is testing a new refuelling system for its ground vehicles at Madrid-Barajas Airport Terminal Four in a bid to cut fuel consumption and CO_2 emissions. The system is being installed in the four trucks used to refuel almost 1,000Ib handling service vehicles at the airport. It is expected to reduce fuel consumption by 5% and reduce CO_2 emissions by 520 tonnes a year, the equivalent of planting 2,600 trees, according to the airline.

In June 2012 Lufthansa published the latest issue of its ‘Balance’ sustainability report, highlighting progress the German airline has made in the area of climate and environmental responsibility. For instance, Lufthansa reported that in 2011 its fleet reduced specific fuel consumption to 4.18 litres per 100 passenger-kilometres, thereby reducing CO_2 emissions. In the area of biofuels, Lufthansa carried out 1,187 flights between July and December 2011 that contained a blend of alternative and conventional fuels on the Hamburg-Frankfurt route, saving around 1,500 tonnes of CO_2.

Staying in Latin America, July 2012 saw LATAM Airlines (the merger of LAN and TAM) announce plans to expand use of the Required Navigation Performance (RNP) system made by General Electric after LAN flew the region's first take off-to-landing route, Cusco-Lima in Peru, using the satellite-based technology. Designed to shorten flights, reduce fuel use, cut carbon emissions and allow planes to navigate despite difficult weather, the new technology is endorsed by ICAO. LAN has so far invested USD$7 million to develop Performance-based Navigation (PBN) at more than 15 airports in Chile and Peru generating savings of about USD$2 million per year. The use of PBN on LAN's Cusco-Lima route is reported to have reduced cancellations due to bad weather in Cusco by 60%, while saving USD$0.5 million in annual fuel costs.

In October 2012 Finnair announced a new weight-saving initiative by selecting Nordisk Aviation Products to provide its wide-body aircraft with lightweight unit load devices (ULDs) which the carrier envisages will result in improved fuel economy and reductions in CO_2 emissions. The ULDs, used for efficiently storing cargo and luggage, weigh 55 kilograms, about 25 kilograms lighter than Finnair’s current ULDs. The new containers will save approximately 0.8 million kg in fuel and more than 2.5 million kg of CO_2 annually. Finnair expected to take delivery of the new ULDs by the end of 2012.

8.8 Airspace / Air Traffic Management

Developments in 2012

In February 2012, following a one-week trial period, Luchtverkeersleiding Nederland (Netherlands Air Traffic Control – LVNL) and the Maastricht Upper Area Control Centre (MUAC) implemented the Arrival Management Message – AMA, an extension of LVNL’s Arrival Manager into MUAC’s Upper Airspace, a further development of the ATM system in the FABEC airspace. An AMA message is sent electronically from Amsterdam to the Maastricht ATC system and contains essential information for managing air traffic inbound to Schiphol. The data received enables air traffic controllers to issue speed instructions at an early stage during the descent to destination. This results in a streamlined amount of traffic, improves flight efficiency, and can result in savings up to 110 kg of fuel per flight affected. The overall objective is to improve flight efficiency by enhancing the scope of continuous decent operations (CDO).

In April 2012, Brussels Airport announced that it was preparing to introduce continuous-descent approaches (CDA) into its standard procedure, following successful trials which indicated promising fuel savings from the technique. Optimal landings are difficult at Brussels Airport due to the complexity of Belgian airspace, owing to it being a crossing point between major European hubs and shared by four military bases. The CDA test results indicated that aircraft the size of an Airbus A320 would typically burn 50kg less fuel, a saving which doubles for long-haul types, as a result of the ability to avoid thrust changes associated with step-down procedures. An additional benefit was a 2-3dB noise reduction 15km from the airport.

In May 2012, Etihad Airways Airbus A330-200 performed first optimized Required Navigation Performance – Authorization Required (RNP-AR) approach to Abu Dhabi International Airport. These approaches utilise continuous descent operations and optimised trajectories which shorten the approach paths to the runway, resulting in reduced noise and flight times, and minimising fuel consumption and CO_2 emissions. Overall, each RNP-AR approach is estimated to reduce fuel consumption by 100 to 200kg and reduce CO_2 emissions by at least 20,000 tonnes per year.

In June 2012 the Middle Eastern airline Emirates announced that its new airspace routings over Africa and the South Atlantic under the IATA iFlex initiative had brought benefits for airlines and significant fuel, CO_2, time and costs savings. Emirates estimated that on the trial routes, approximately 4,200tn of fuel and 13,200tn of CO_2 emissions per year can be saved on the four routes to South America and Western Africa. To illustrate route-specific efficiencies, for April 2012, Emirates' outbound Dubai-Brazil flights saved 657kg of fuel from 3 minutes less flight time to Rio de Janeiro and 490kg from the same flight time reduction to Sao Paulo. On the return flights, with 7 minutes savings on each, 1,123kg of fuel was saved from Rio to Dubai and 1,017kg from Sao Paulo. Similarly, on the Dubai-Lagos return, a total of 2,232kg of fuel from 17 minutes saved flight time was realised and 2,762kg and 14 minutes saved on the round-trip Dubai to Accra.

8.9 Sustainable Alternative Aviation Fuels

Developments in 2012

In January 2012 the Australian government science agency CSIRO and Boeing announced the launch of a study to evaluate the potential to turn biomass into alternative aviation fuel as part of a roadmap released in 2011. The roadmap will assess the potential of biomass production systems based on feed-stocks in combination with grazing or cropping in regional Queensland. It will also assess the technology needed to turn the feed-stocks into jet fuels, and production systems and technology compatible with local infrastructure, with the aim to find and match new fuel sources to existing land uses. The roadmap states that by using a variety of existing and new non-food biomass resources and sustainable practices for growing them, there will be sufficient biomass to support almost half of the aviation fuel needs of Australia and New Zealand by 2020 and more than 100% of fuel needs by 2050. If this is achieved, the two countries could save more than A$2 billion a year on jet fuel imports and achieve a 17% annual reduction in aviation greenhouse gas emissions.

In February 2012 in the U.S, President Barack Obama announced that his administration is promoting nascent algae-based biofuels as an alternative to fossil fuels, declaring that up to 17% of imported oil – for transportation – could be replaced with this home-grown alternative. According to research, algae can be harvested from ponds near industrial sites, where it can grow from power-plant carbon emissions or wastewater substances, and can provide up to 5,000 gallons of biofuel per acre of algae, compared to an acre of soybeans producing 60 to 70 gallons.

In March 2012 Qantas Airways announced it would operate Australia's first commercial flights powered by sustainable aviation fuel. The flights, a Sydney-Adelaide return service operated by an Airbus A330, will be powered by a biofuel derived from used cooking oil blended with kerosene. Produced by SkyNRG, the fuel's 'life cycle' carbon footprint is around 60% smaller than that of conventional jet fuel.

Also in March, EADS/Airbus, Boeing and Embraer signed a Memorandum of Understanding (MoU) to work together on the development of drop-in, affordable aviation biofuels. The three leading airframe manufacturers agreed to seek collaborative opportunities to speak in unity to government, biofuel producers and other key stakeholders to support, promote and accelerate the availability of sustainable new jet fuel sources. The MoU includes the development of industry open standards and methodologies to assess energy and carbon lifecycles.

In April 2012 All Nippon Airways took delivery of a Boeing 787 powered in part by sustainable biofuels. The delivery flight between Everett in Washington state and Tokyo flew with biofuel made mainly from used cooking oil and emitted an estimated 30% less CO_2 emissions in comparison to similar-sized aircraft in use today. Boeing stated that, of the reduction in greenhouse gases, about 10% can be attributed to the use of biofuel and 20% to the technology and efficiency advancements offered by the B787.

In June 2012 Boeing, in cooperation with Air China and PetroChina, announced it will progress with a second test flight that will be partly powered by plant oil. The test, scheduled for the third quarter 2012, will likely involve a trans-Pacific trip, far longer than the one-hour test flight that was conducted in China last October. The planned test will involve use of a biofuel produced by PetroChina from locally grown jatropha. Analysts suggest that jatropha based fuel, produced with oil extracted from seeds, could have particular appeal in China, where there are huge swathes of barren land that could be turned to growing the plant.

In July 2012, the "ProBio3" project, co-financed by the French Government, was initiated with the aim of using traditional horse-bedding materials to develop an alternative fuel to be used in a blend with kerosene. To date, most attempts at developing biofuels have focussed on crop-based products, raising concerns over competition with food industries. With a budget of €24.6m over eight years, ProBio3 aims to set up a production chain for hydro-processed oils, a type of biofuel which has been certified by international standards organisation ASTM as useable for aviation in combination with kerosene. Industrial or farm waste is broken down into sugars, mixed with micro-organisms and transformed into lipids. The fats obtained are then treated with hydrogen to make a type of hydrocarbon with similar properties to fossil fuels. The ProBio3 project is part of an EU drive to reach annual output of 2 million tonnes of biofuels for aviation by 2020 in Europe.

Also in July Air Canada operated a biofuel-powered flight on the Montreal-London route, with expectations that it would generate up to 10% fewer emissions. 20% of the fuel required by the Airbus A330 on this flight will be a 50/50 mix of kerosene and biofuel derived from recycled cooking oil, a blend produced by SkyNRG. As well as the use of alternative fuels, Air Canada also employs other techniques and measures on its flights to reduce impact on the environment, including pre-flight fuselage wash and wax to improve aerodynamics; taxiing the aircraft to the runway with one engine; reduced thrust on take-off; optimized climb to optimal cruise altitude; constant descent using optimized descent rate along most direct routing; minimizing use of APU at gate through use of ground power.

In August 2012, Commercial Aircraft Corp. of China (COMAC) and Boeing opened the Boeing-COMAC Aviation Energy Conservation and Emissions Reductions Technology Center, announcing the first research project will explore opportunities to refine waste cooking oil into sustainable aviation biofuel. According to COMAC, waste cooking oil shows large potential for sustainable aviation biofuel production as China consumes approximately 29 million tons of cooking oil annually, versus the 20 million tons of jet fuel, which its aviation system uses each year.

In September 2012, the US FAA and the German Federal Ministry of Transport, Building and Urban Development signed an agreement to collaborate in the promotion and development of sustainable alternative aviation fuels in the United States and Germany. The goals of the new agreement are to exchange ideas and collaborate on problems and projects of mutual interest relating to the development of sustainable alternative aviation fuels, leveraging research, knowledge and expertise.

In October 2012, the European Commission (EC) published proposals to limit the amount of food-based (so-called "first generation") biofuels and bioliquids that can be counted towards the overall 10% target it set for the transport sector in 2009 at the current consumption level of 5% until 2020. The EC hopes this move will provide market incentives for biofuels that have no or low indirect land use change (ILUC) emissions, known as second and third generation biofuels, including biofuels produced from feedstock that do not create an additional demand for land and do not directly compete with food. These include algae, straw and various types of waste. The EC has reviewed the impact of ILUC on greenhouse gas emissions due to concerns that demand for biofuels will be met through an increase in the amount of land devoted to agriculture worldwide, leading to an indirect increase in emissions from land conversion. Recent studies have shown that if biofuel production causes food or feed production to be displaced to non-agricultural land such as forests, some biofuels may add as much to greenhouse gas emissions as the fossil fuels they replace.

In November 2012, British Airways and Solena announced that they are gaining momentum in their goal of producing sustainable jet fuel with technology partners with details of its GreenSky London initiative. This flagship project will see the construction of a facility that will convert 500,000tn of waste, annually, that is normally destined for landfill, into 50,000tn of sustainable low carbon jet fuel, 50,000tn of biodiesel, bionaphtha and renewable power. British Airways has committed to purchasing the jet fuel produced by the plant for the next ten years which equates to US$500 million at today's prices. The partners aim to have the site operational by 2015.

8.10 Solar power developments

Solar-powered flight

In July 2012, 'Solar Impulse', the four-engine aircraft which features around 12,000 solar cells arranged on its wingspan, successfully concluded the world's first roundtrip fully solar-powered intercontinental flight by landing safely at Payerne, Switzerland on its return journey from Ouarzazate, Morocco, with intermediate stops in Madrid and Rabat.

Solar Energy at Airports

In February 2012 London Gatwick Airport announced the installation of the UK's first 'liveside' solar system, positioned 150 metres away from the main runway. Rated at 50 Kilowatts, the solar system is comprised of photovoltaic panels that convert solar energy into electricity, aimed at limiting the airport site's contribution to climate change resulting from greenhouse gas emissions. According to the airport, the system will save 25 tonnes of CO2 on our operational carbon footprint per year. Several issues had to be overcome before this airport solar technology could be put in place. These included ensuring that the system didn't produce potentially dangerous forms of glare or interrupt any of the radar signals transmitted at ground level. To guarantee that the criteria for safe operation were met, both NATS (the National Air Traffic Service) and the CAA (Civil Aviation Authority) were consulted.

On the theme of solar power, Geneva International Airport in Switzerland announced in March 2012 the development of one of the largest solar arrays in the country. The airport's solar thermal system is planned to comprise 300 panels, designed to convert solar rays into heat for use around the airport. These 300 solar panels will cover a roof-top expanse of 1,200 m^2. This highly advanced technology, developed by CERN, is intended to maximise the solar energy design's storage capacity and gives it an all-year round capability.

8.11 European Union Emissions Trading Scheme (EU ETS)

On 1st January 2012, the aviation sector became officially included in the EU ETS. The system covers all the CO_2 emissions from flights departing from or arriving at EU airports (and extended to include EEA states). Aircraft operators will be required to monitor and report their emissions on an annual basis, and then surrender the equivalent number of allowances to their annual emissions. The scheme is designed to allow the aviation industry to grow sustainably whilst at the same time ensuring it pays commensurately for its emissions.

The emissions cap for aviation in the EU ETS for 2012 was set at 97% of the average emissions between 2004 and 2006, falling to 95% of the historic baseline from 2013 to 2020. In this cap, 85% of the allowances will be allocated for free, including 3% of allowances in a special reserve for new or rapidly growing aircraft operators.

However, on 12 November 2012 the European Commission issued a press statement[123] declaring that, in agreement with the 27 Member States, it is 'stopping the clock' on the implementation of the international aspects of its ETS aviation by deferring the obligation to surrender emissions allowances from air traffic to and from the EU by one year.

However, the obligations relating to all operators' activities within the EU (i.e. on intra-EU services) are to remain intact and this will be enforced in line with EU law.

The Commission made the decision following news from the ICAO Council that progress had been made in reaching agreement on establishing a path towards a global solution to reduce aviation greenhouse gas emissions. Specifically, the ICAO Council agreed to form a special High-level Group to provide recommendations on the feasibility of a global market-based measure (MBM) scheme appropriate to international aviation, as well as its development of a policy Framework to guide the general application of any proposed MBM measures to international air transport activity[124].

[123] Stopping the clock of ETS and aviation emissions following last week's International Civil Aviation Organisation (ICAO) Council; European Commission; 12/11/2012. http://europa.eu/rapid/press-release_MEMO-12-854_en.htm

[124] New ICAO Council High-level Group to Focus on Environmental Policy Challenges; ICAO; 15/11/2012. http://www.icao.int/Newsroom/Pages/new-ICAO-council-high-level-group-to-focus-on-environmental-policy-challenges.aspx

Citing that ‘stopping the clock’ would create space for the political negotiations required to formulate a global solution, the Commission stressed that in the event of the ICAO Assembly failing to move forward the EU ETS legislation would be applied in full again from 2013 onwards.

The moratorium for international flights does not, however, remove the requirement on all airlines operating at EU airports to provide emissions data, due by the end of April 2013. By May 2013, according to reports[125], the European Commission stated that "aircraft operators responsible for over 98% of the 2012 aviation emissions covered by the EU ETS have successfully taken the necessary steps to date to comply with the EU ETS legislation”. Following the deadline for compliance, however, some 10 Chinese and Indian airlines had reportedly still not complied.

International opposition to the scheme has led to some countries banning their airlines from participating.

In late November, after the European Commission had ‘stopped the clock’, the United States signed into law legislation that enables the country’s transportation secretary to prohibit U.S airlines from participating in the EU ETS[126]. The law does, however, also give the secretary the authority to reassess the prohibition if the EC amends the scheme or an international agreement on aircraft emissions is reached through ICAO.

As international tensions mounted during 2012 following aviation’s inclusion into the ETS from January 1st, Chinese authorities threatened retaliatory measures against the EU, including banning its airlines from operating into European airports and halting orders from China for Airbus aircraft. Similar measures were threatened by Russian and Indian authorities. All parties subsequently welcomed the Commissions’ decision to suspend the process for one year.

However, in Europe, airline organisations such as the European Regional Airlines Association (ERAA) and the International Air Carrier Association (IACA) voiced concern that with intra-EU flights remaining in the scheme, it could create an unbalanced competitive environment, increasing the cost-burden for airlines operating intra-EU flights. The airline associations called for a moratorium on all flights, to avert the unintended consequences of this two-tier approach.

[125] Chinese, Indian carriers face fines for missing EU emissions data; Flightglobal; 17 May 2013; http://pro.flightglobal.com/news/articles/chinese-indian-carriers-face-fines-for-missing-eu-emissions-data-386000/

[126] Obama signs bill enabling US airlines to skirt EU ETS; ATWonline; 27/11/12. http://atwonline.com/aeropolitics/obama-signs-bill-enabling-us-airlines-skirt-eu-ets

9. Aviation Safety & Security

9.1 Introduction

This chapter covers aviation safety and security matters.

The section on safety details fatal airline accidents that occurred worldwide in 2012 together with trends in aviation accidents over the last twenty years. The section also details some of the major aviation safety and associated regulatory developments over the year. In 2012, there were 21 fatal commercial airline accidents worldwide by aircraft greater than 5,700kg causing the deaths of 426 passengers and crew. This is lowest number of fatal accidents in recent history and represents a major achievement. The number of fatalities from these accidents in 2012 also represents a historic low. But it is too early yet to say whether this part of a new declining trend which after a period of major decline in the 1990s has been relatively flat in the last ten years.

The section goes on to describe some of the key developments and progress in the security industry, over the course of 2012, both in the European Union and globally.

ICAO held a series of regional conferences across the world to promote the implementation of its Declaration on Aviation Security. IATA called upon governments to work with industry to develop a pragmatic approach to keeping aviation secure by balancing risk and regulation, and issued a call to transition aviation security from a one-size-fits-all proscriptive approach to a risk-based, results-driven model. The areas of security screening and the carriage of liquids, aerosols and gels (LAGS) are explored, as well as offering an outlook on the future of aviation security.

9.2 2012 Safety Review

9.2.1 Fatal Accidents Worldwide

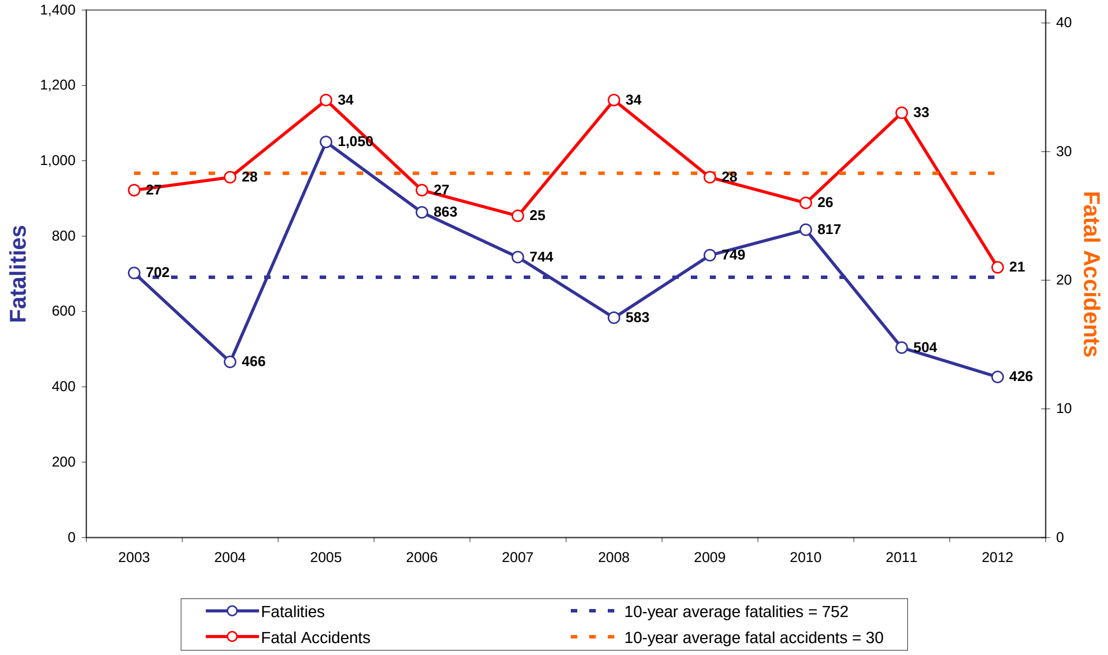
In 2012, there were 21 fatal commercial airline accidents worldwide causing the deaths of 426 passengers and crew (Table 9.1) This spans all types of commercial airline operations, including scheduled and non-scheduled passenger flights, by jets and turboprop aircraft greater than 5700kg; and non-passenger operations such as cargo or positioning flights. By comparison, in 2011, there were 33 fatal commercial airline accidents causing 504 deaths. The trend over the last ten years in absolute terms is shown in Figure 9.1, whilst Figure 9.2, taken from the EASA 2012 review, shows the global twenty year trend in fatal accidents per 10 million flights which takes into account the increase in traffic over that period.

Table 9.1: Fatal Commercial Aviation Accidents 2012

Date	Operation	Operator	A/c Type	Location	Fatalities	Phase
20-Apr	Scheduled Pax	Bhoja Airlines	B737-200	Near Islamabad Bhutto Airport, Pakistan	127	RA
03-Jun	Scheduled Pax	Dana Air	MD-83	Near Lagos Intl Airport, Nigeria	153	RA
25-Dec	Scheduled Pax	Air Bagan	Fokker 100	Heho Airport, Myanmar	1	RA
02-May	Non-Scheduled Pax	Airworks	Cessna 208B Caravan	Yambio Airport, South Sudan	2	L
19-Aug	Non-Scheduled Pax	Alfa Airlines	Antonov An-26	Near Talodi, Sudan	32	AA
18-Nov	Non-Scheduled Pax	Gogal Air Service	Cessna 208B Caravan	Snow Lake Airport, Canada	1	TO
02-Apr	Regional/Commuter	UTair	ATR 72-200	Near Tyumen Airport, Russia	31	C
14-May	Regional/Commuter	Agni Air	Dornier 228-200	Near Jomsom Airport, Nepal	15	AA
22-Aug	Regional/Commuter	Mombasa Air Safari	Let 410UVP	Ngerende Airfield, Masai Mara Reserve, Kenya	4	TO
12-Sep	Regional/Commuter	Petropavlovsk-Kamchatsky Air Enterprise	Antonov An-28	Near Palana Airport, Russia	10	AA
28-Sep	Regional/Commuter	Sita Air	Dornier 228-200	Kathmandu Airport, Nepal	19	C
07-Oct	Regional/Commuter	FlyMontserrat	BN Islander	Bird Intl Airport, Antigua	3	TO
22-Dec	Regional/Commuter	Kivalliq Air	Swearingen Metro III	Sanikiuaq Airport, Canada	1	RA
30-Jan	Non-Passenger Flight	Tracep Congo Aviation	Antonov An-28	Near Namoya, DR Congo	3	AA
15-Mar	Non-Passenger Flight	Jet One Express	Convair Cv340	Near San Juan Intl Airport, Puerto Rico	2	RA
21-Apr	Non-Passenger Flight	SkyTeam	Curtiss Commando C-46	Santa Cruz Viru Viru Airport, Bolivia	3	L
06-Jun	Non-Passenger Flight	Air Class	Swearingen Metro III	Rio de la Plata estuary, Uruguay	2	ER
06-Nov	Non-Passenger Flight	Baron Aviation	Cessna 208B Cargomaster	Near Wichita Mid-continent Airport, USA	1	AA
30-Nov	Non-Passenger Flight	Aero Service	Ilyushin 76T	Brazzaville Mayo-Mayo Airport, Congo	7	RA
17-Dec	Non-Passenger Flight	Amazon Sky	Antonov An-26	Near Tomas, Peru	4	ER
29-Dec	Non-Passenger Flight	Red Wings	Tupolev Tu-204	Moscow Vnukovo Airport, Russia	5	L

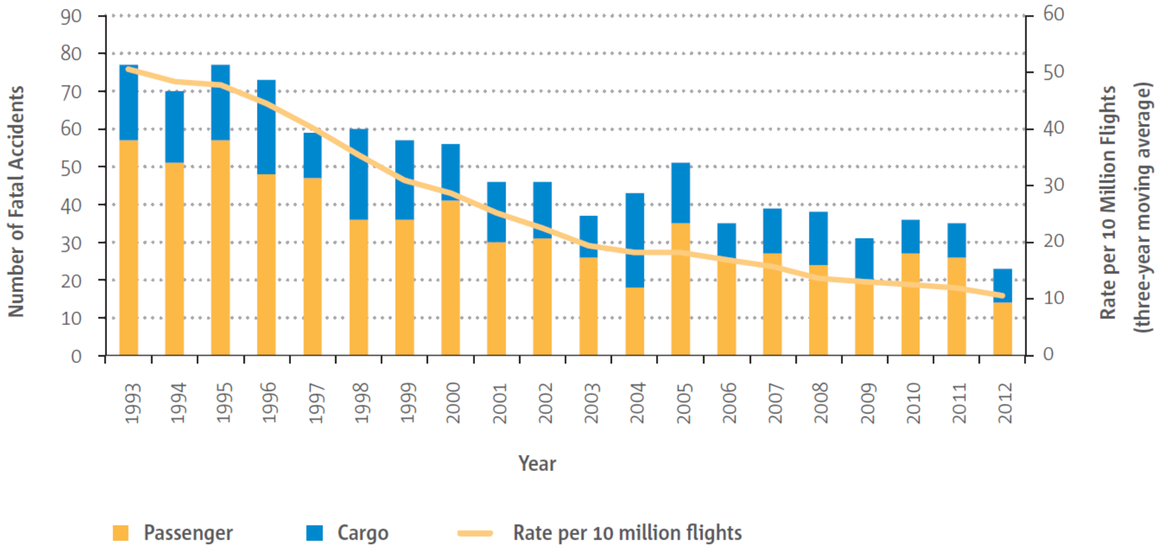
Source: Flight International updated (Key to Phase of Flight: AA = Airfield Approach; C = Climb; ER = En Route, G= On Ground; L = Landing, M/A = Missed Approach; RA = Runway/Final Approach; TO = Take Off)

Figure 9.1: World Commercial Airline Fatal Accidents and Fatalities 2003 to 2012



Source: Flight International based on Ascend/Flightglobal. For aircraft >5,700kg.

Figure 9.2: Number and rate per 10 million flights of scheduled passenger and cargo fatal accidents worldwide per year 1993-2012



Source: EASA Annual Safety Review 2012. For aircraft with MTOW >2,250kg.

At 21, the global number of commercial airline fatal accidents in 2012 is the lowest in recent history and represents a major achievement. The number of fatalities from these accidents in 2012 also represents a historic low. But it is too early yet to say whether this part of a new declining trend. Whilst the longer term trend demonstrates a four-fold improvement in the annual numbers of commercial fatal accidents per 10 million flights over the last twenty years, both graphs indicate a flattening of the downward trend in the last ten years.

The worst accident of 2012, in terms of the number of fatalities, involved a Boeing MD-83 which crashed into residential property on final approach to Lagos International Airport, killing all 153 people on board and with many other casualties on the ground. The crew had declared an emergency, believed to be power loss, but the circumstances are not yet clear. The second worst accident, with 127 fatalities, involved a Boeing 737-200 which crashed at dusk in poor visibility and in bad weather on an ILS approach to Islamabad Bhutto Airport.

Of the 21 fatal accidents in 2012, 5 (24%) occurred during take off or climb, 2 (10%) en route and 14 (67%) during approach or landing. The 2012 percentages of fatal accidents by phase of flight show a higher proportion of accidents during approach and landing compared to 2011, but a lower percentage of accidents in the en route phase. Table 9.2 shows the numbers of commercial fatal accidents globally by phase of flight for the last 3 years.

Table 9.2: Fatal Commercial Airline Accidents Globally 2010 to 2012 by Phase of Flight

Phase of Flight	2010	2011	2012	2010 to 2012
Take Off/Climb	5 (19%)	5 (15%)	5 (24%)	15 (19%)
En Route	9 (35%)	12 (36%)	2 (10%)	23 (29%)
Approach/Landing	11 (42%)	15 (45%)	14 (67%)	40 (50%)
Ground/Other	1 (4%)	1 (3%)	0 (0%)	2 (3%)
Total	26	33	21	80

Source: Flight International based on Ascend/Flightglobal

9.2.2 2012 Accidents by Region

In December 2012, IATA published[127] statistics (complete up to the end of November 2012) of accident rates by world region based on hull losses rather than fatal accidents. Separate rates were provided for western-built jet hull losses (Figure 9.3) and total hull losses which includes eastern and western jets and turboprop aircraft (Figure 9.4). For comparison purposes, the latest published data on fatal accidents by World Region, as provided by EASA in June 2013[128], is shown in Figure 9.5.

In terms of western-built jet hull loss accidents, all regions performed better in 2012 compared to 2011 with the exception of Europe which had a single (non-fatal) accident involving substantial damage compared to zero jet hull losses last year. This accident involved a BAe Jetstream 31 operating from Leeds-Bradford Airport, United Kingdom that departed the runway on landing at Ronaldsway, Isle of Man. The aircraft was substantially damaged when the starboard undercarriage collapsed. The cause is believed to be corrosion-induced fatigue. There were no injuries amongst the twelve passengers and two crew. North America,

[127] Safety Presentation, IATA Global Media Day, 13 Dec 2012

[128] Annual Safety Review 2012, EASA, June 2013

North Asia and the Commonwealth of Independent States (CIS) had zero western-built jet hull losses in 2012, this being a particular improvement for the CIS. Overall the hull-loss accident rate for Western built jets halved in 2012 compared to 2011. In addition, IATA reported no western-built jet hull losses amongst its member airlines in 2012.

When looking at all hull loss accidents, 7 regions performed better than in 2011 and 3 worse, these being Africa, Asia Pacific and Europe. Although the hull loss accidents for Europe as a whole increased, this makes no distinction between EASA and non-EASA Member States. For the 10 years up to 2011, the 10 year fatal accident rate was 1.6 accidents per 10 million flights for EASA Member State airlines, compared to 32.9 fatal accidents per 10 million flights for non-EASA Member State airlines (Figure 9.5). It should also be noted that although there were hull loss accidents in Europe in 2012, there were no fatal accidents by commercial airlines, repeating the outcome of 2010. In 2011, there was one fatal commercial aircraft accident in Europe involving a Swearingen SA227 turboprop aircraft that went out of control on its third attempted approach, in poor visibility, to Cork Airport in Ireland, resulting in 6 fatalities.

Although 2012 has been an exceptional year in statistical terms, the accident record still demonstrates many of the characteristics of recent years in that the serious accidents are occurring in airlines whose names are unknown outside their local regions, most of them in developing economies. The safety performance disparity between established carriers (such as IATA member Airlines) and others appears to be growing.

There are probably a number of reasons behind this trend, but one factor is that these smaller and less well known carriers often operate with older style aircraft. In July 2012, Boeing published its annual statistical summary of commercial jet airplane accidents[129]. Figure 9.7 (sourced from that report) shows the breakdown for hull loss accidents by worldwide jet aircraft type from 1959 to 2011. The figure is sorted by the year of introduction of each aircraft type, with the oldest at the top and the more recent at the bottom. It clearly shows the trend of improving safety performance of modern jet aircraft compared to their predecessors.

One of the regions of most concern is Africa which saw nearly a 60% increase in the hull loss accident rate from 8.1 accidents per million flights in 2011 to 12.7 accidents per million flights in 2012. In December 2012, IATA reported[130] that the African accident rate had varied between 3 and 12 times worse than the world average – yet its traffic only constituted a 2.5% to 3.5% share of global traffic.

In collaboration with ICAO and industry stakeholders, IATA developed a Safety Improvement Plan in May 2012, targeting the most prominent accident types in Africa, including runway excursions and loss of control.

The plan was presented to Civil Aviation Authorities (CAAs) in Africa during the African Union Ministerial meeting in July 2012 and became part of the document known as the Abuja Declaration. The Africa Strategic Improvement Action Plan is based on the following priorities:

- Establishment of independent and sufficiently funded civil aviation authorities.

[129] Statistical Summary of Commercial Jet Airplane Accidents, Worldwide Operations 1959 – 2011, Boeing, July 2012
[130] Safety Presentation, IATA Global Media Day, 13 Dec 2012

- Adoption and implementation of an effective and transparent regulatory oversight system including mandating the implementation of the IATA Operational Safety Audit (IOSA)
- Implementation of runway safety measures- three runway safety workshops were supported in 2012 in Africa
- Training on preventing loss of control
- Implementation of flight data analysis (FDA) and implementation of the IATA Global Safety Information Center (GSIC) Flight Data eXchange (FDX)
- Implementation of Safety Management Systems (SMS)

IATA, ICAO and leading aviation stakeholders and regulatory organisations committed to this plan following the Africa Safety Summit held in Johannesburg in May 2012. The key areas were developed based on an analysis of air transport accidents in Africa between 2006-2010 conducted by IATA and ICAO. This analysis identified that the main contributing factors to accidents were insufficient regulatory oversight and the lack of SMS implementation. Implementation of tools such as FDA could have pinpointed precursors to the major accident types, namely runway excursions, controlled flight into terrain and loss of control. Runway excursions alone accounted for about a quarter of African accidents.

The plan must also include the urgent resolution of all identified Significant Safety Concerns (SSCs) and the certification of all international airports. Figure 9.6 highlights the difference between the aviation accident rates in Africa for IATA and non-IATA members. The arrows in the figure indicate the implementation of safety programs in Africa. In 2012, Africa IOSA carriers had no accidents, and the focus is to grow the safety programs to non-IATA members.

For its part, the EU continues to press for concrete safety improvement actions by African and other carriers. In April and December 2012, the European Commission published the 19th and 20th updates of the European safety list of air carriers subject to operating bans and other operational restrictions in the EU[131].

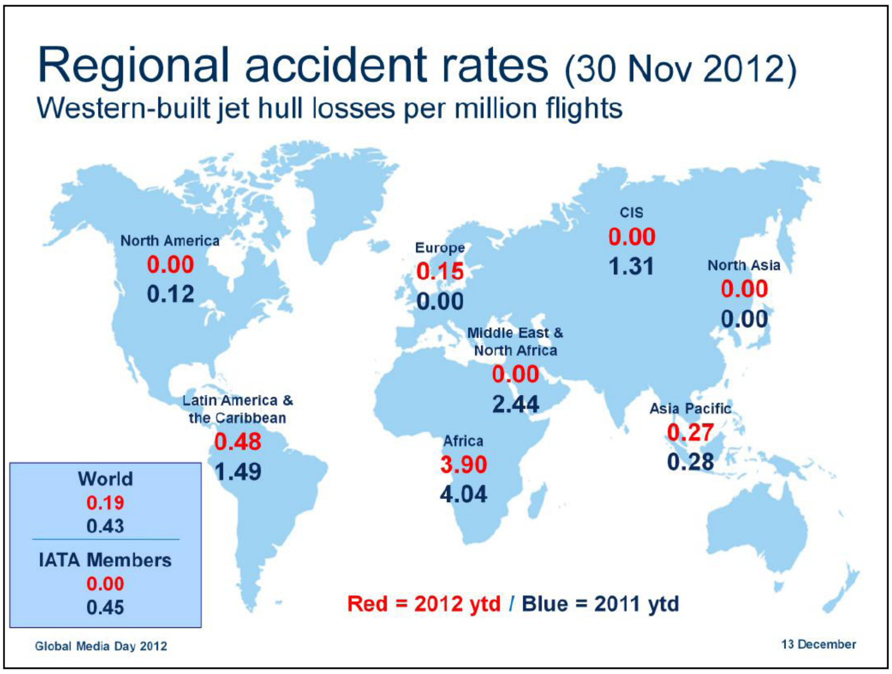
The latest European air safety list includes all carriers certified in 20 States (of which 15 are African), accounting for 287 known air carriers, whose operations are fully banned in the European Union: Afghanistan, Angola, Benin, Republic of Congo, the Democratic Republic of Congo, Djibouti, Equatorial Guinea, Eritrea, Gabon (with the exception of three carriers which operate under restrictions and conditions), Indonesia (with the exception of six carriers), Kazakhstan (with the exception of one carrier which operates under restrictions and conditions), Kyrgyzstan, Liberia, Mozambique, Philippines, Sierra Leone, Sao Tome and Principe, Sudan, Swaziland and Zambia.

The list also includes three individual carriers: Blue Wing Airlines from Surinam, Meridian Airways from Ghana and Conviasa from the Bolivarian Republic of Venezuela.

Additionally, the list includes 10 air carriers which are subject to operational restrictions and are thus allowed to operate into the EU under strict conditions: Air Astana from Kazakhstan as well as Afrijet, Gabon Airlines and SN2AG from Gabon as mentioned before, Air Koryo from the Democratic People Republic of Korea, Airlift International from Ghana, Air Service Comores, Iran Air, TAAG Angolan Airlines and Air Madagascar.

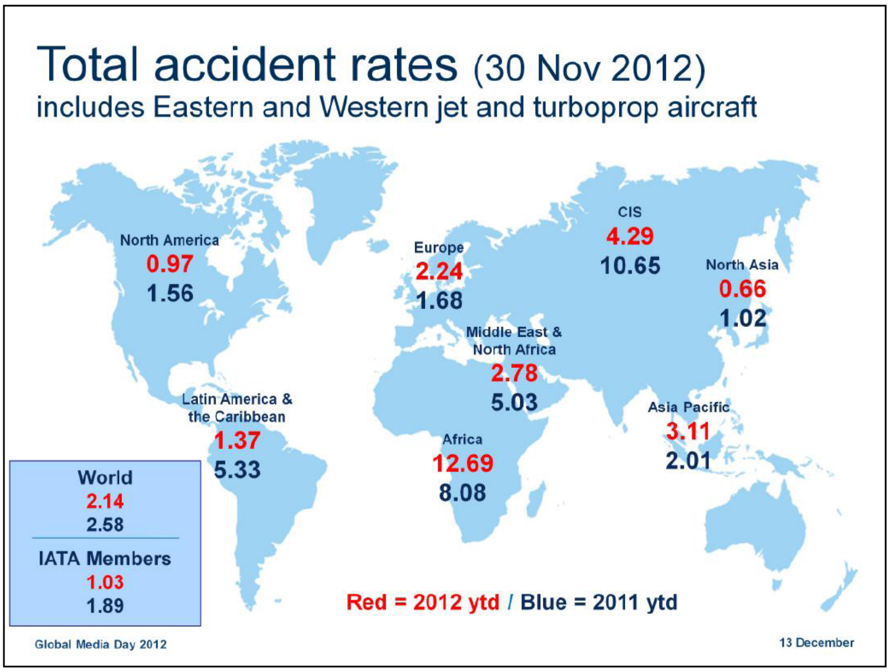
[131] Commission Implementing Regulation (EU) No 1197/2011 of 21 November 2011 amending Regulation (EC) No 474/2006 establishing the community list of air carriers which are subject to an operating ban within the Community.

Figure 9.3: 2012 v 2011 Accident Rates by World Region – Western Built Jet Hull Loss Accidents



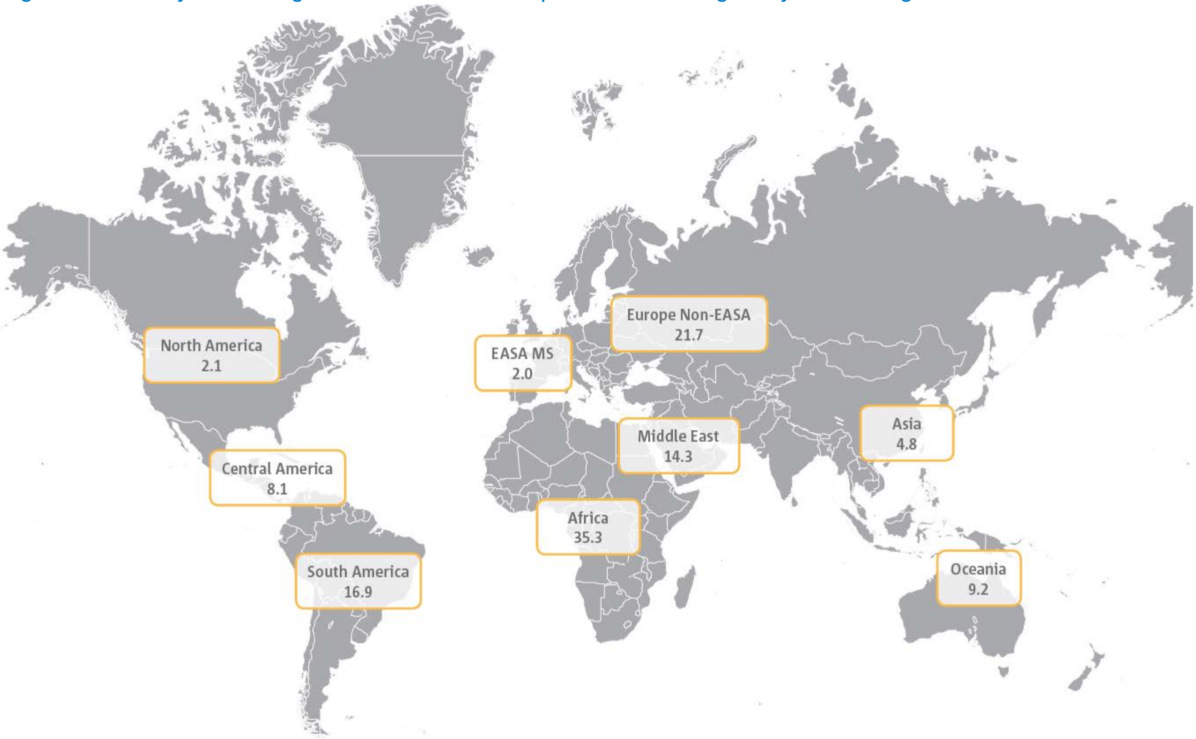
Source: IATA

Figure 9.4: 2012 v 2011 Accident Rates by World Region – All Hull Loss Accidents



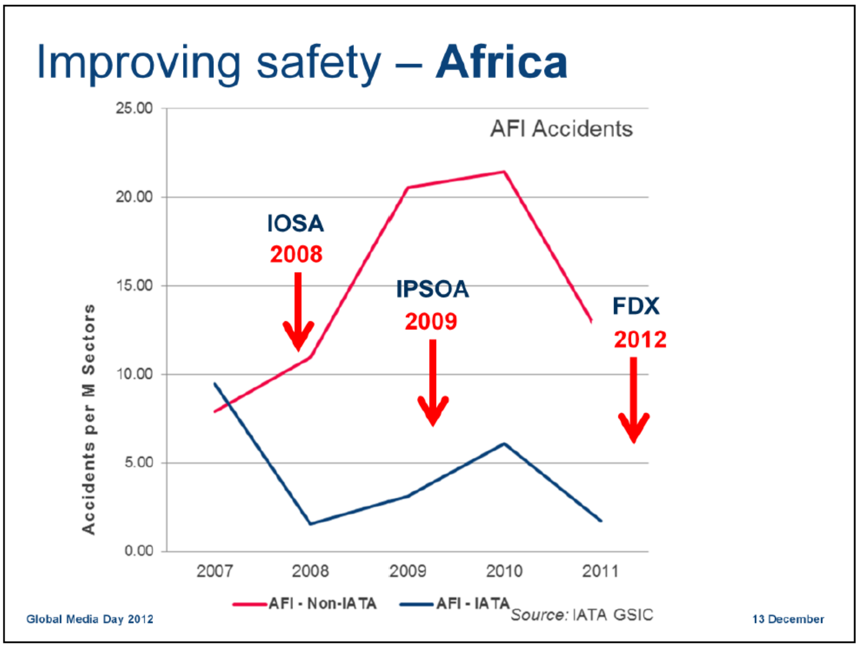
Source: IATA

Figure 9.5: 10 year average Fatal Accident Rate per 10 Million Flights by World Region, 2002 to 2012



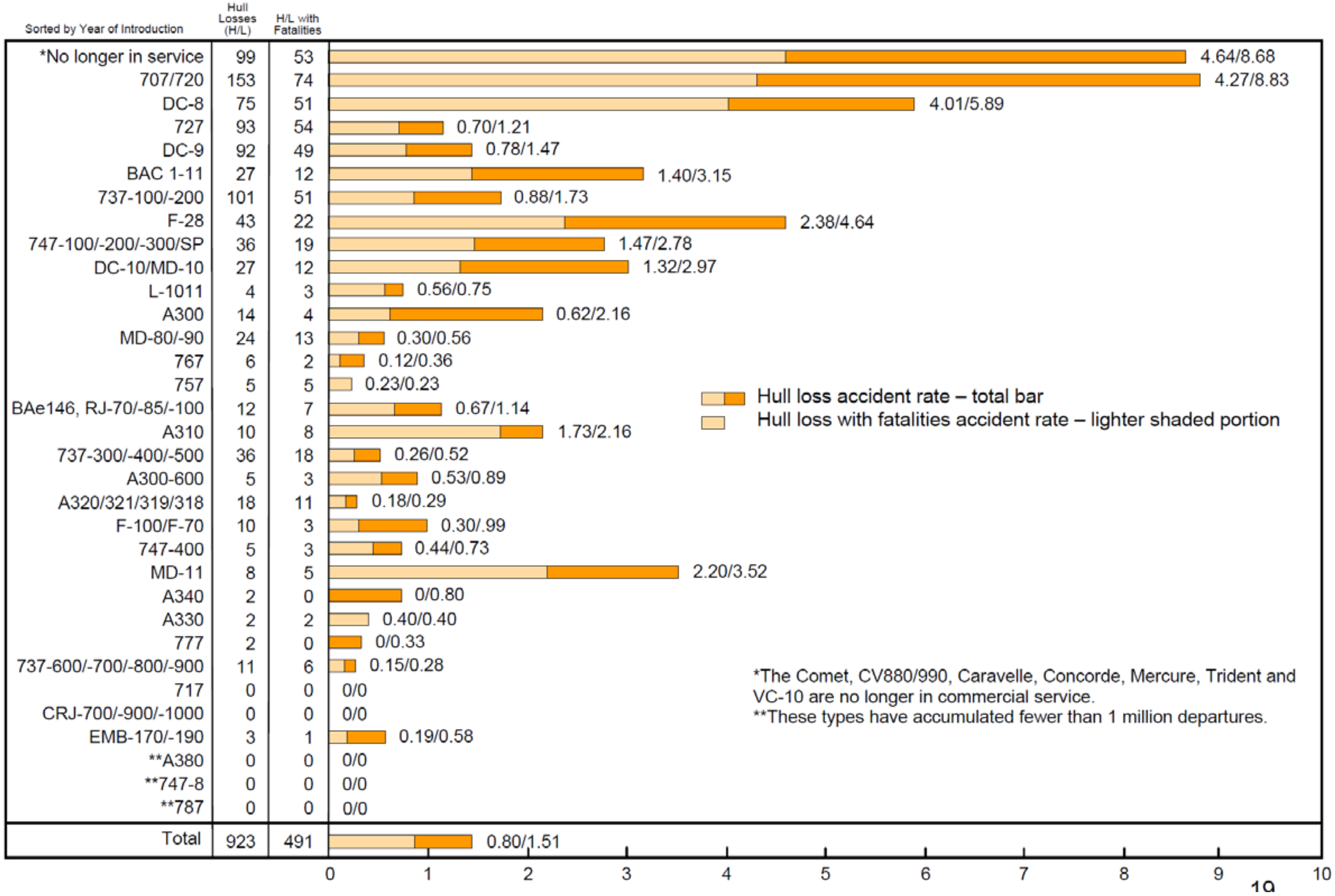
Source: EASA Annual Safety Review 2012. Scheduled passenger and cargo operations only

Figure 9.6: Airline Accident Rates in Africa – IATA v non-IATA Members



Source: IATA [IOSA = IATA Operational Safety Audit; IPSOA = Implementation Program to assist in the implantation of IOSA; FDX = Flight Data eXchange]

Figure 9.7: Hull Loss Accidents – Worldwide Commercial Jet Fleet – 1959 to 2011



Source: Statistical Summary of Commercial Jet Airplane Accidents, Worldwide Operations 1959 – 2011, Boeing, July 2012

9.2.3 Trends in Accident Categories

As reported by the Flight Safety Foundation in February 2012[132], CFIT (Controlled Flight Into Terrain), approach and landing and loss of control continue to account for the majority of accidents worldwide, as well as cause the majority of fatalities. Unstabilised approaches and a failure to go around when warranted are major risk factors. An unstabilised approach is an approach during which an aircraft does not maintain at least one of the following variables stable: speed, descent rate, vertical/lateral flight path and in landing configuration. This is often characterised as approaches conducted either as “low/slow” or “high/fast”. Studies show that 3 to 4 per cent of all approaches are unstabilised, and that of these 9 out of 10 continue to landing. Failure to go around is a factor in over 80% of approach and landing accidents and it is the leading cause of landing runway excursions.

The most significant safety challenge for commercial turboprops continues to be CFIT accidents. In the three years 2009 to 2011, 1 in 4 turboprop major accidents has involved CFIT. CFIT has not been eliminated in commercial jets, but the industry is making progress in reducing it. For turboprops, it is not the same positive story.

The worst year in the past eight years for global commercial CFIT accidents (jets and turboprops combined) was 2011. None of the eight commercial aircraft involved in a CFIT accident in 2011 had a functioning terrain awareness and warning system (TAWS). In fact, in the more than 50 commercial aircraft CFIT accidents over the last 5 years, only two of the aircraft were equipped with TAWS. In both cases, the TAWS functioned normally and gave the flight crews sufficient warning of the impending CFIT accident.

In July 2013, EASA, in its Annual Safety Review[133], reported that Loss of Control, CFIT, aircraft system failure, and fire post impact have accounted for the most number of fatal accidents over the period 2003 to 2012. For non-fatal accidents, the major causes are abnormal runway contact, system failure (non-powerplant) and accidents on the ground.

In its previous annual safety review, EASA reported that CFIT accidents involving EASA Member State operated aircraft have had an overall decreasing trend over the past decade. This can be attributed to technological improvements and to increased awareness of situations which may lead to such accidents. A similar trend is also shown for accidents which involve the failure of a system or component directly related to the operation of an engine, SCF-PP (‘System or Component failure related to powerplant’). However, in recent years there has been an increasing trend in the number of accidents involving loss of control (LOC-I).

[132] Down Time, James M Burin, Flight Safety Foundation, February 2012

[133] Annual Safety Review 2012, EASA, July 2013

9.2.4 Report into the 2009 Air France Accident in the South Atlantic

In July 2012, the French Civil Aviation Investigation Authority, the BEA, published its final report[134] into the crash of the Air France A330, Flight AF 447, on 1st June 2009 that went down off the coast of Brazil, killing all 228 on board. The accident occurred following the obstruction of the Pitot probes by ice crystals, during which the speed indications were incorrect and some automatic systems disconnected. The aeroplane's flight path was not controlled by the two co-pilots resulting in a stall situation that lasted until the impact with the sea.

The BEA reported that the accident resulted from the following succession of events:

- Temporary inconsistency between the measured airspeeds, likely following the obstruction of the Pitot probes by ice crystals that led in particular to autopilot disconnection and a reconfiguration to alternate law,
- Inappropriate control inputs that destabilised the flight path,
- The crew not making the connection between the loss of indicated airspeeds and the appropriate procedure,
- The PNF (Pilot Not Flying) late identification of the deviation in the flight path and insufficient correction by the PF (Pilot Flying),
- The crew not identifying the approach to stall, the lack of an immediate reaction on its part and exit from the flight envelope,
- The crew's failure to diagnose the stall situation and, consequently, the lack of any actions that would have made recovery possible.

The BEA has addressed 41 Safety Recommendations to the DGAC, EASA, the FAA, ICAO and to the Brazilian and Senegalese authorities related to flight recorders, certification, training and recurrent training of pilots, relief of the Captain, SAR and ATC, flight simulators, cockpit ergonomics, operational feedback and oversight of operators by the national oversight authority.

Following the accident, EASA has conducted investigations into pitot tube obstruction, autopilot reconnection and the effect of multiple pitot tube blockages. Two Airworthiness Directives were issued, AD 2009-0195[135] immediately following the accident, and AD 2010-0271[136] in December 2010. In October 2009, EASA published Decision N°2009/014/R[137] updating the European technical specification ETSO C16 for Pitot and Pitot-static tubes. The Agency is participating in the EUROCAE WG-89 which is working on the preparation of a new ETSO standard for Pitot probes. The Agency is also contributing to international research projects aimed at improving knowledge of high altitude icing conditions, in particular in profound convection areas, with the presence of high concentrations of ice crystals. This will be used to further improve the certification specifications in the future.

[134] Final Report on the accident on 1st June 2009 to the Airbus A330-203 registered F-GZCP operated by Air France flight AF 447 Rio de Janeiro – Paris, Bureau d'Enquêtes et d'Analyses pour la sécurité de l'aviation civile (BEA), 27 July 2012

[135] Navigation – Airspeed Pitot Probes – Replacement, AD 2009-0195, EASA, 31 August 2009

[136] Auto Flight – Auto Pilot & Auto-Thrust Disconnect – Operational Procedure, AD 2010-0271, EASA, 22 December 2010

[137] Decision No 2009/014/R of 14 October 2009 amending the Annex to Decision No 2003/10/RM of the Executive Director of the Agency of 24 October 2003 on Certification Specifications, including Airworthiness Codes and Acceptable Means of Compliance, for European Technical Standard Orders (CS-ETSO)

9.2.5 A380 Wing Cracks

In December 2011, cracks were discovered on the wings of a Qantas-owned Airbus A380 that was being repaired after an engine explosion in Singapore. In January 2012, EASA issued an Airworthiness Directive (AD) grounding 20 A380 for visual inspections. This initial directive allowed up to six weeks for a detailed visual inspection to be carried out on A380 aircraft that had completed between 1,300 and 1,799 flights. Any A380 that had completed more than 1,800 flights had to be inspected within four days. This initial round of checks found cracks in almost all of the planes inspected.

The most serious cracks were located on brackets that attach the A380's wing ribs – the oval-shaped frames that run along the width of the wing – to the wing's metal skin. The cracks were caused by the stress generated when the brackets were fastened to the skin during the manufacturing process. The impact was exacerbated by the flexing of the wings during flight. The A380 wings were designed and built in the UK, at facilities in Filton outside Bristol and Broughton in north Wales.

As a result of the initial inspections, EASA revised their AD, requiring the inspection of all 68 Airbus A380 in operation worldwide at the time, and the use of high-frequency eddy current equipment for crack detection. A further AD, in June 2012, also required repetitive inspections of certain wing rib feet and, depending on findings, accomplishment of applicable corrective actions.

EASA expects to certify the permanent modification to wings of in-service aircraft and those that have been built, but not yet delivered, in the first quarter of 2013. Certification of the newly designed wing is now expected to happen in the second quarter of 2013. The new wings will become available in early 2014. Qatar Airways has deferred delivery of its first A380 by several months to enable Airbus to integrate the redesign on all Qatar aircraft on order.

In-service aircraft are currently subject to short-interval checks and preliminary repairs that must be repeated depending on utilisation. The permanent fix, which includes the replacement of several hybrid ribs made of composites and the Al 7449 alloy, is expected to require aircraft to be grounded for several weeks. Airbus also has offered airlines a repair schedule that can be included in C-checks, so that no additional ground time is needed. However, that would spread modifications over a longer period of time.

The modifications affect 120 aircraft, 92 of which had been delivered by the end of November 2012. At that time, Airbus owner EADS reported that it had taken a €200m hit, so far, from costs related to repairing of the cracks. Dubai-based Emirates is its largest A380 customer, with 26 of the aircraft.

9.3 Strategic Safety Issues

9.3.1 Just Culture

One of the key principles of safety management is Just Culture. “Just Culture” is defined as “a culture in which front line operators or others are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but where gross negligence, wilful violations and destructive acts are not tolerated.” The ambition being that the implementation of Just Culture will create a non-punitive and learning environment allowing for the collection of reliable and accurate safety data.

Within the EU, the principle of "Just Culture" is found within EU Regulation 996/2010[138] on the investigation and prevention of accidents and incidents in civil aviation. Article (24) of that Regulation states: "The civil aviation system should equally promote a non- punitive environment facilitating the spontaneous reporting of occurrences and thereby advancing the principle of 'just culture'". The concept of Just Culture is also enshrined within SES II legislation. Regulation EC 691/2010[139], amended by Regulation 1216/2011[140], requires, amongst other things, the development and monitoring of safety key performance indicators at the national and EU level, one of which is on the level of just culture. This measure is to be developed jointly by the Commission, the Member States, EASA and Eurocontrol. Although Reg. 691/2010 does not obligate Member States to adopt national safety targets in this first reference period (2012 to 2014), they are encouraged to include in their Performance Plans their own safety targets and indicators for monitoring purposes.

Just Culture is widely seen, and has been for a number of years, as key for further improvement of aviation safety reporting through more and better reporting of aviation occurrences, but progress in implementing it is still in its infancy in some Member States[141], particularly where changes to primary legislation are required. Ensuring a judicial process in the aftermath of aviation incidents or accidents which achieves a balance between justice and safety requirements is essential. This is recognised in a number of international legal texts including ICAO Annex 13 as well as EU 996/2010.

In the last year, the International Air Transport Association (IATA)[142] has expressed its concerns with respect to an increasing trend toward the criminalisation of accidents, either subsequent to or concurrent with the safety investigation itself. Two such high profile examples are the criminal investigations following the crash of an Air France Concorde in Paris in July 2000[143] and the crash of a Helios Airways Boeing 737 in August 2005[144]. Ironically, the nature of these parallel investigations is often of potentially conflicting agendas. According to IATA, "The sole aim of the safety investigation is to find out what went wrong and to use this information to prevent a similar accident happening again. The criminal investigation, on the other hand, tries to find out who is to blame for an accident and then punish those concerned."

In April 2012, the European Commission organised a seminar entitled "Just Culture in the Context of Occurrence Reporting Schemes"[145]. The seminar was attended by around 100 participants representing all parts of aviation industry, regulation and oversight. The Seminar was part of the consultation process for the Impact Assessment on the revision of EU legislation on occurrence reporting in civil aviation. It was preceded by a questionnaire sent to Member States and an online public consultation. One of the outcomes of these consultations was that Just Culture was the most frequently mentioned issue and that

[138] Regulation (EU) No 996-2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation repealing Directive 94/56/EC

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

[140] Commission Implementing Regulation (EU) No 1216/2011 of 24 November 2011 amending Commission Regulation (EU) No 691/2020 laying down a performance scheme for air navigation services and network functions,

[141] SES II Performance Scheme, Assessment of National/FAB Performance Plans with Performance Targets for the period 2012-2014, Performance Review Body (PRB) of the Single European Sky, Sep 2011

[142] Safety: The Blame Game. IATA Press Release on the Criminalisation of Accidents, June 2012

[143] Accident on 25 July 2000 at La Patte d'Oie in Gonesse (95) to the Concorde registered F-BTSC operated by Air France, Bureau d'Enquêtes et d'Analyses pour la sécurité de l'aviation civile (BEA) Aircraft Accident Report, Jan 2002

[144] Helios Airways Flight HCY522 Boeing 737-31S at Grammatiko, Hellas on 14 August 2005, Hellenic Republic Ministry of Transport and Communication, Air Accident and Aviation Safety Board (AAIASB) Aircraft Accident Report 11/2006

[145] Just Culture in the Context of Occurrence reporting Schemes. 19 April 2012, Brussels.

both stakeholders and Member States expect the Commission to address this issue and improve the current situation in the revised legislation.

An essential condition for establishing a "Just Culture" at national level is an enhanced co-operation and co-ordination between safety and judicial authorities. In September 2012, Eurocontrol's Just Culture Task Force, which is composed of legal and safety experts of the Member States, European Commission, ATM and Air Transport associations and Eurocontrol itself, published a "Model Policy[146]" regarding criminal investigation and prosecution of civil aviation incidents and accidents. The purpose of the Model Policy is to provide a template, background and guidance to those Member States wishing to develop and implement a just culture policy.

9.3.2 Incidents and Occurrence Reporting

European Directive 2003/42/EC[147] on occurrence reporting in civil aviation placed an obligation on Member States to make 'all relevant safety-related information' stored in their databases available to the competent authorities of other Member States and the European Commission and to ensure that their databases were compatible with software developed by the European Commission (i.e. ECCAIRS software). Furthermore, Member States were obliged to integrate their occurrence data into the European Central Repository (ECR) according to Commission Regulation (EC) No 1321/2007[148], while Commission Regulation (EC) 1330/2007[149] laid down implementing rules for the dissemination of the information contained within the ECR.

While significant progress has been made, with all of the Member States integrating their data into the ECR by the end of 2011, there are a still a large number of incidents reported with very sparse supporting information. The European Commission has identified a number of reasons for this:

- There is a discrepancy in the scope of reportable occurrences between the Member States.
- Individuals fear of reporting (the "Just Culture" issue) because they may be asked to report mistakes they may have made or contributed to and, depending on the Member State, they may not be protected from punishment or prosecution.
- Occurrence data integration is not harmonised and is unstructured causing a low quality of information and an incompleteness of data. This situation affects the consistency and the usefulness of information for safety investigation and trend identification.
- There are legal and organisational obstacles for ensuring adequate access to information contained in the European Central Repository. European legislation obliges the de-identification of certain information in order to protect sensitive safety information, but its practical consequence is that important safety related facts, such as the actual description of the occurrence, are not available to the authorities.
- Finally, the current legislation does not include provisions indicating how Member States should use the data collected. Although principles related to the analysis have been agreed at international level, they have not yet been transposed into European legislation. This has led to quite diverse and divergent approaches among Member States.

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[146] Just Culture Policy, Eurocontrol, Sep 2012

[147] Directive 2003/42/EC of the European parliament and of the Council of 13 June 2003 on occurrence reporting in civil aviation

[148] Commission Regulation (EC) 1321/2007 of 12 November 2007 laying down implementing rules for the integration into a central repository of information on civil aviation occurrences

[149] Commission Regulation (EC) 1330/2007 of 24 September 2007 laying down implementing rules for the dissemination to interested parties of information on civil aviation occurrences

To address these issues, the European Commission, following extensive consultation with all Member States and all interested stakeholders and authorities, has prepared a proposal[150] in December 2012 for the adoption of a regulation on occurrence reporting which will replace and repeal the existing Directive. The purpose of this initiative is to contribute to the reduction of the number of aircraft accidents and related fatalities, through the improvement of existing systems, both at national and European level, using civil aviation occurrences for correcting safety deficiencies and prevent them from reoccurring.

The package of proposals recommended under the proposed new legislation consists of the following elements:

☐

- Better collection of occurrences
- Clarification of the flow of information
- Improved quality and completeness of data
- Better exchange of information
- Better protection against inappropriate use of safety information
- Better protection of reporter to ensure the continued availability if information
- Introduction of requirements on information analysis and adoption of follow up actions at national level
- Stronger analysis at EU level
- Improved transparency towards the general public

9.4 Safety Developments relating to 2012

This section details aviation safety developments relating to 2012. It is not a comprehensive listing, but is intended to highlight initiatives or analysis of particular interest. Only new material is presented that was not covered in the previous edition of Annual Analyses[151].

9.4.1 Single European Sky Performance Scheme

In July 2012, the Performance Review Body (PRB) of the Single European Sky issued its report[152] on the preparation of the revision of the SES Performance Scheme addressing Reference Period 2 (RP2), which covers the period 2015 and beyond. The Scheme covers Air Navigation Service (ANS) provision in four Key Performance Areas (KPAs) of Safety, Environment, Capacity and Cost-Efficiency. Only safety is dealt with here in this Annual Analyses report, the other KPAs are covered in other chapters.

The PRB reported that the main safety performance objective of RP1 (Reference Period 1 covering the three years 2012 to 2014) had been to improve and harmonise reporting across Europe (through regular monitoring of leading and lagging indicators) and that the logical step in RP2 was the improvement of risk management. Therefore, a framework for the development of performance indicators and targets for RP2 needed to foster continuous improvement of safety of the ANS/ATM system in Europe.

In order to achieve this specific objective, it was necessary to improve not just the risk management but also the system of safety assurance. This should ultimately ensure that safety performance monitoring and

[150] Proposal for a Regulation of the European Parliament and of the Council on occurrence reporting in civil aviation amending Regulation (EU) No 996/2010 and repealing Directive No 02203/42/EC, Commission Regulation (EC) No 1321/2007 and Commission Regulation (EC) No 1330/2007. Com (2012) 776 final, 18 December 2012.

[151] Annual Analyses of the EU Air Transport Market 2011, Final Report for the European Commission, Mott MacDonald, January 2013

[152] Report on the preparation of the revision of the SES performance Scheme addressing RP2 and beyond, prepared by the Performance Review Body (PRB) of the Single European Sky. Release Issue Version 1.0. 17 July 2012.

measurements as well as the management of change were working properly. In addition, continuous improvement of safety would require proactive continuous safety performance monitoring.

With respect to RP1 Safety Performance Indicators (SPIs), the PRB's proposed approach was as follows:

- Develop and where possible set up appropriate targets (either qualitative or quantitative) for the three RP1 SPIs (Effectiveness of Safety Management, Just Culture, and application of Risk Analysis Tool (RAT) methodology) to be applied as of 2015.
- Review RP1 SPIs and their metrics for issues of practical application and, where necessary, implement appropriate updates.
- Further develop RP1 SPIs, where appropriate, and only monitor the new elements during RP2.

For RP2, three risk management/safety assurance areas with a high potential for improvement have been identified. These relate to the level and quality of incident reporting as well as the development, implementation and effectiveness of mitigation measures to address key risk areas and the management of change. The PRB has proposed the identification of SPIs that can steer the safety behaviour (within these three identified areas) in the desired direction. The following recommendations are proposed:

- The introduction of independent safety performance monitoring that is not dependent on voluntary reporting or self-assessment, with mandatory application of automated reporting of Separation Minima Infringements and Runway Incursions as a minimum.
- A measure for the effectiveness of Runway Safety programmes following the expected mandatory implementation of Safety management Systems (SMSs) under the current development of EU rules for Aerodrome Operators and the responsible oversight authorities[153].
- The requirement for a qualitative safety evaluation of State ANS Performance Plans that evaluates the interdependencies between KPAs in relation to the safety KPA, and identifies risks and defined mitigation action plans that are implemented and monitored.

9.4.2 ICAO Developments

In May 2012, ICAO published the first edition of the manual of Aircraft Accident and Incident Investigation, Part II – Procedures and Checklists (DOC 9756). The manual addresses the procedures, practices and techniques to be used in investigations, including comprehensive guidance on Investigation Management System and a Major Accident Investigation Guide (MAIG).

In June 2012, ICAO and Airports Council International (ACI) signed a Memorandum of Cooperation (MoC) to provide a framework to jointly pursue the highest possible levels of safety at airports worldwide. It will allow both organisations to join forces to improve aviation safety through:

- Supporting the development of the ACI Airport Excellence (APEX) in Safety Programme, designed to help airports worldwide to identify and address safety vulnerabilities;
- Joint technical assistance projects;
- The regular exchange of safety-relevant information and data and by providing mutual access to databases;
- Exchanging experts and providing training; and

[153] Opinion No 01/2013 of the European Aviation Safety Agency of 05 February 2013 on the Authority, Organisation and Operations Requirements for Aerodromes

- Promoting regional cooperation.

In June 2012, the Air Navigation Commission completed its final review of a comprehensive amendment to Annex 14, Volume 1 – Aerodrome Design and Operations, for review and adoption by the Council in early 2013. The amendments are aimed at enhancing aerodrome safety in particular runway safety in the following areas:

- RESA (Runway End Safety Area) and arresting Systems
- Runway surface condition assessment and reporting
- Emergency Response, rescue and fire fighting
- Simple touchdown zone lights
- Use of LED technology for visual aids for aerodromes

The Central European Rotation Group (CERG) represents on the Council of ICAO the States of Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia. In 2012, CERG coordinated a series of three international courses for safety experts and investigators in Prague. Fifty safety experts and investigators participated and the subjects covered were aircraft accident investigation, human factors for investigators and safety management systems. In September 2012, CERG members also took part in an ICAO/CERG Air Law Conference. The conference discussed issues in the international legal framework pertaining to aviation safety, including unmanned aircraft systems and licensing and training.

In November 2012 ICAO and the Flight Safety Foundation (FSF) signed a new agreement formalising their plans to cooperatively promote and advance the sharing of aviation safety information and metrics worldwide. The new, collaborative initiative supports ICAO Safety Management System (SMS) guidance that calls for increased monitoring, analysis and reporting of aviation safety results. It is one of several important, new agreements signed by ICAO since 2010, as it seeks to expand its co-operative activities.

The ICAO-FSF Memorandum of Cooperation (MOC) will see the two bodies working more closely to enhance global compliance with ICAO Standards and Recommended Practices (SARPs) and related guidance material. It promotes joint activities between the organisations in the areas of data sharing and analysis, training and technical assistance. The joint analyses developed will facilitate the harmonisation of proactive and predictive safety metrics and the promotion of a just safety culture globally.

ICAO and FSF will shortly begin convening regular regional forums to share aggregated results on emerging safety issues and facilitate improved collaboration on targeted mitigation strategies. Both organisations are already consulting with a number of States on upcoming demonstration projects.

In November 2012, ICAO issued its second annual safety report. The report provides a high-level analysis of global air transport safety trends and indicators, progress on its Universal Safety Oversight Audit Programme (USOAP), as well as updates on aviation safety programmes being undertaken by ICAO and its partners around the world. Progress on USOAP was covered under the previous edition of Annual Analyses.

9.4.3 European Aviation Safety Plan

Following two implementation and review summits in May and November 2012, EASA has published the third edition of its European Aviation Safety Plan (EASp)[154] aimed at tackling key aviation safety risks. This updated roadmap identifies 103 safety actions for implementation between now and 2016 to tackle operational, systemic and emerging aviation safety issues. It covers the period between 2013 and 2016, and has been developed using the same methodology as the previous two editions.

Central to that Action Plan's recommendations is the uniform and consistent application of ICAO provisions. It also contains practical recommendations with guidance materials to assist operational staff. EASp is one of the key outcomes of a Safety Management System being implemented for the European region as a whole to facilitate more pro-active identification of safety hazards and with the ultimate goal of managing safety risks. It is the documented SMS safety plan and starts by identifying those areas in which coordinated action will make a difference in avoiding accidents and serious incidents.

Support for the EASp has been growing and its implementation has been extended to 45 States: 31 EASA States plus the 14 States outside the EASA system that are members of ECAC. ICAO Annexes and Regulation 691/2010 (Performance Scheme for Air Navigation Services and Network Functions) require that States establish a State Safety Plan (SSP). Within ECAC, 21 States have provided a report detailing progress on the implementation of safety actions at the State level. The majority of States have modified their law to enact an SSP and published a document describing how the management of safety is organised in their States. Almost half of them have also published a Safety Plan. Many States are developing indicators; however no single State has agreed targets with industry and service providers. A small number of States have established a link between the indicators and the risk areas coming from their Safety Plans. The establishment of SPIs and targets at both national and European level is one of the priorities for future work for EASA in co-ordination with Member States.

9.4.4 Flight and Duty Time Limitations (FTL)

In September 2012, EASA published its Opinion[155] containing its final proposals to amend the current EU rules on flight and duty time limitations and rest requirements (FTL) for commercial air transport. The proposed rules contain more than 30 safety improvements compared to current requirements and introduce new limitations to the way crews can be scheduled.

The Opinion takes full account of the fact that fatigue is one of the main factors affecting human performance and makes no provision for increased pilot flight hours. On the contrary, allowed duty periods at night are reduced, rest for flights with time zone crossings is significantly increased, and new rules are introduced for limiting crew standby.

These FTL rules are the final step in a fully transparent rulemaking process, with unprecedented scientific input and public consultation. More than 50 scientific studies were analysed, while all concerned stakeholder groups including flight and cabin crew organisations, airlines, and Member State representatives were consulted throughout the process.

[154] European Aviation Safety Plan 2013-2016, Final Edition, EASA, February 2013

[155] Opinion No 04/2012 of the European Aviation Safety Agency of 28 September 2012 for a Regulation establishing Implementing Rules on Flight and Duty Time Limitations and rest requirements (FTL) for commercial air transport (CAT) with aeroplanes

The Opinion will now enter the legislative process. It will be finalised by the European Commission and must be approved by Member States, with Parliamentary scrutiny. The new rules are expected to be adopted into EU law after mid-2013 and fully implemented by the end of 2015It is well established that human performance is a key paradigm in aviation safety today, and fatigue is one of the main factors affecting human performance. It is crucial that safety regulations provide both flight and cabin crew with the best possible conditions to ensure they remain alert during all phases of the flight.

9.4.5 EASA – Other Key Regulatory Developments

In August 2012, the European Commission published Regulation 748/2012[156] of 3 August 2012, laying down implementing rules for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations. This new Regulation is replacing Regulation (EC) 1702/2003. It is a consolidation of the initial version of 1702/2003 together with seven subsequent stand-alone amendments, changes resulting from four Agency Opinions, and further changes introduced by the Commission. The new Regulation entered into force on 10 September 2012.

Following this, in October 2012, EASA adopted issue 2 of Acceptable Means of Compliance and Guidance Material (AMC/GM) to Part 21[157] as a clean version consolidating the initial issue of 'AMC and GM to Part 21' of 17 October 2003 and all the changes adopted by the Agency since the initial issue including the new recast of Part 21 in Regulation (EU) No 748/2012.

In October 2012, new European rules came into force concerning Air Operations. Commission Regulation (EU) No 965/2012[158] was issued which creates harmonised requirements at the European level for commercial air transport operations of aeroplanes and helicopters. The associated AMC/GM was also published. The legislative process has ensured continuity with previous rules. For aeroplane operators, the new rules recognise the privileges of existing certificate holders. Member States also have the flexibility to delay the applicability of the rules for up to two years. To assist stakeholders in adjusting to the new rules, EASA has published a detailed list of differences between the new Regulation and EU-OPS / JAR-OPS 3.

[156] Commission Regulation (EU) 748/2012 of 3 August 2012 laying down implementing rules for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations

[157] Decision No 2012/020/R of the Executive Director of the Agency of 30th October 2012 on acceptable means of compliance and guidance material for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations (AMC and GM to PART 21)

[158] Commission Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council

9.5 Aviation Security

9.5.1 ICAO

During 2012, a series of regional conferences were held in different parts of the world to promote the implementation of ICAO's Declaration on Aviation Security (adopted in October 2010). Conferences were held in Kuala Lumpur (January), Caracas (February) and Bahrain (April) to build consensus in advance of a global, high-level security conference held at ICAO Headquarters in September 2012.

Participants at the regional conferences endorsed ICAO's global leadership role in aviation security, both regionally and globally. They called on ICAO and other stakeholders to continue with capacity-building initiatives that help address deficiencies that pose risks to civil aviation security. They also underlined the need to work more closely together in response to threats and incidents, and stressed that ICAO must continue to address, as a matter of priority, threats to the global air cargo system by enhancing supply chain security.

ICAO High-level Conference on Aviation Security

The Conference was attended by more than 700 participants, including ministers and senior security officials from 132 ICAO Member States and 23 international organisations. The Conference agreed on a number of measures to enhance aviation security worldwide and exchanged views on how to improve the responsiveness of all key stakeholders to aviation security threats.

On the topic of air cargo security, a number of working papers highlighted the need for cooperation among nations and also among relevant services and entities within countries. A number of interventions underlined the necessity for strengthening cooperation between Customs and aviation security/transport agencies, calling upon ICAO to closely cooperate with the Universal Postal Union (UPU) and the World Customs Organisation (WCO) to create synergies and strengthen end-to-end supply chain security and facilitation.

WCO reported on the progress made through cooperation among relevant agencies, organisations and industry stake holders, in particular with respect to the harmonization of the AEO and Regulated Agent and Known Consignor programmes and also the potential for sharing certain advance cargo data received by Customs with aviation security/transport agencies.

Following the WCO's request for the Conference to endorse and support ongoing work, a number of delegations expressed their full support for this work and highlighted the need to ensure close cooperation and coordination between relevant agencies, as this would allow for the efficiency and effectiveness of measures for air cargo security taken by aviation security/transport agencies and Customs administrations.

The Conference confirmed its full support for the work being done by the WCO and ICAO to strengthen the security and facilitation of end-to-end supply chains. It also highlighted the need for appropriate capacity building activities which would need to into account existing activities by ICAO Members, as well as organisations like the WCO.

Highlighting the importance of a more coordinated global response to evolving terrorist threats and the need to make the provision of aviation security less of a burden for industry and passengers, the Conference endorsed strategies and action based on international cooperation, improved information-sharing and proactive approaches.

Besides their agreement on the transition to a risk-based, collaborative global framework, Conference delegates agreed to establish processes for identifying and handling high-risk air cargo and protecting supply chains. They will also be implementing tighter measures to address potential threats posed by airport, airline and cargo sector personnel.

Recognising the importance of leveraging the latest in innovative technologies and processes, the Conference delegates requested ICAO to convene a dedicated aviation security technology symposium in 2014. They also endorsed a blueprint for monitoring States' compliance with resources to assist those in need of assistance.

9.5.2 Air Cargo Security

Around 50 million tonnes of air cargo were transported in 2012, representing around 35%, by value, of global trade. Over half of that air cargo was transported on passenger aircraft.

EU – Air Cargo Security

The current regulatory framework within the EU provides a comprehensive set of rules on the security of air cargo and mail. The EU security regime is essentially based on the twin pillars of the secure supply chain or physical screening of consignments.

The secure supply chain

The EU regulatory framework requires that only so-called "regulated agents (RA)", such as freight forwarders, hauliers, etc., may tender air cargo or air mail for up-lift on to an aircraft. Regulated agents must meet strict standards of approval, as assessed by the Appropriate Authority of an EU Member State, which include requirements for security control procedures and requirements for staff recruitment and training.

Companies who regularly originate air cargo or air mail can apply for the status of a "known consignor (KC)". Also these entities must meet strict standards of approval, as assessed by or on behalf of the Appropriate Authority of an EU Member State, which include requirements for security control procedures and requirements for staff recruitment and training. Consignors may also be designated as an "account consignor (AC)". As such entities are not approved by the appropriate authority but designated by an RA; as a result the consignments they originate may only be transported on board an all-cargo aircraft.

Consignments originated by a KC or an AC may be tendered by a regulated agent to an air carrier for up-lift on to an aircraft without screening if the integrity of the air cargo or air mail is kept since security controls have been applied by the KC or AC (i.e. if the secure supply chain is maintained).

Until April 2010, EU regulations required KC's to be designated by a RA, whereas after this date KC's are required to be approved by the appropriate authority. A transition period of three years was put in place for those KC's designated by an RA, which ended on 29 April 2013. From that date, every KC needs to be approved by the appropriate authority.

Screening of consignments

All consignments of air cargo or air mail that have not been originated by a KC or an AC or where the integrity of such air cargo or air mail has not been kept until loading onto an aircraft, must be screened by an RA by at least one of the means or method specified in the EU regulatory framework and to a standard sufficient to reasonably ensure that no prohibited articles are concealed in a consignment. The primary means or method for screening air cargo or air mail employed may be: x-ray, explosive detection equipment (including trace detection systems and explosive detection dogs) and manual or visual checks.

The European Commission continuously monitors the implementation of aviation security rules at EU airports and of appropriate authorities in the Member States. In addition, Member States are obliged to have their own detailed quality control monitoring system, including regular checks on regulated agents and known consignors. This ensures a double-layered system of compliance controls in the EU. The Commission is helping Member States with the correct implementation of these controls, including technical assistance and training where required.

On 1 February 2012, Regulation (EU) No 859/2011 regarding security measures on air cargo and mail coming from non-EU countries became applicable. This Regulation provided a basic framework for the designation of EU and non-EU air carriers as so-called ACC3, which allows them to carry cargo or mail into the Union from a non-EU airport. The Regulation also introduced rules for air cargo and mail being carried to Union airports from those so-called third countries in order to:

- Protect civil aviation that was carrying such cargo or mail from acts of unlawful interference; and,
- Work towards achieving enhanced cooperation on aviation security, supporting the implementation and application of standards and principles in third countries equivalent to those of the Union where this was effective to meet global threats and risks.

Commission Regulation (EU) No 1082/2012 replaces and expands Regulation 859/2011 by establishing a regulatory framework for the EU aviation security validation of ACC3's and entities they do business with, to establish secure supply chains for cargo and mail carried to the EU, similar to those set up within the EU for secure transportation of air cargo and air mail.

EU/US Agreement on Air Cargo Security Procedures

In June 2012, the US and EU reached agreement on recognising each other's air cargo security procedures. Under the terms of the agreement, the US Transportation Security Administration (TSA) accepts European rules on the screening of cargo and mail and the maintenance of a secure supply chain for all airlines and freight shippers flying cargo and mail from or through the EU. This will allow all air carriers flying out of the EU and Switzerland to apply EU security measures as a means of complying with US law. Similarly, the EU recognises the equivalence of the US air cargo security regime which will allow cargo flying from the US into the EU and Switzerland not to be subjected to additional EU security measures at US airports.

This mutual recognition is expected to reduce costs and improve the speed and efficiency of trans-Atlantic shipments of goods.

World Customs Organisation (WCO) – Air Cargo Security

As a response to the 2001 terrorist attacks in the US, The World Customs Organization (WCO) developed its SAFE Framework of Standards to facilitate and secure global trade, initially focusing on maritime security. The 2010 air cargo incident, where Yemen air cargo packages to the US involving explosives were intercepted in the UK and Dubai, encouraged the WCO to also turn its focus to air cargo security.

In June 2011, at the WCO Council Sessions, ICAO and the WCO signed a Memorandum of Understanding (MOU)[159] for increased cooperation to protect air cargo from acts of terrorism or other criminal activity and for speeding up the movement of goods by air worldwide. The cooperation between ICAO and WCO focused on aligning air cargo regulatory frameworks to include electronic advance data, the sharing of information at various levels (government-to-government, Customs-to-Customs and Customs-to-industry), training and education and risk management.

In July 2012, ICAO and WCO held a joint conference in Singapore where it was agreed that the requirements of aviation security and Customs need to be considered at the same time. ICAO had previously taken steps to contribute to this effort, whereby cargo-related Standards and Recommended Practices were further strengthened, and include a requirement for ICAO Member States to establish a supply chain security process. There is still a need to agree on appropriate security measures for air cargo to be transported on all-cargo aircraft. Issues related to identifying high-risk cargo and the appropriate security measures to apply to these consignments must also be addressed. It is also crucial to pursue full implementation of the ICAO Standard requiring States to have supply chain security systems. Customs authorities and security regulators can enhance air cargo security by agreeing on how advance cargo information can be collected, assessed and used to mitigate risk.

To help assess the threat to the air cargo system, ICAO developed a global Risk Context Statement which will help States to conduct their own risk assessments and to respond with appropriate security measures.

International Air Transport Association (IATA)

Through the Secure Freight program, IATA is providing assistance and advice to countries to implement a secure supply chain program where none already exists. Major shippers have generally been content to comply with the programme, seeing the benefits of the streamlined process. IATA's Secure Freight Program applies across the entire air cargo supply chain, helping to secure shipments by ensuring that cargo has come from either a known consignor or a regulated agent. Secure Freight evaluates the strength of a nation's aviation security infrastructure and works with the civil aviation authorities to ensure that cargo is kept sterile until it is loaded. Not only does this ensure greater security, it also helps prevent bottlenecks at airports.

The Secure Freight Program continued to gain recognition from governments around the world during 2012. IATA and the Malaysia Civil Aviation Authority signed a Memorandum of Understanding (MOU) on expanding the Secure Freight pilot scheme, which began in 2010.

The UK Department of Transport (DfT) agreed to endorse the Secure Freight principles, paving the way for further recognition of Secure Freight principles and IATA's efforts to build supply chain security capacity across the world.

Five governments agreed to be co-signing authorities on IATA's Information Paper on Secure Freight, which was presented at ICAO's AVSEC Panel, in March 2012. The countries co-signing the document include civil aviation authorities from Malaysia, Kenya, Mexico, UAE and Chile.

[159] ICAO News Release PIO 13/11, 27 June 2011

US Transport Security Administration (TSA)

Following a ruling by the TSA, each piece of cargo on commercial passenger flights landing at US airports will have to be pre-screened after 3 December 2012. The measure was announced almost five years after the 9/11 Commission Act first recommended that such a cargo screening rule should be enforced.

The measure requires explosives checks be carried out on all US-inbound air cargo, calling for universal "risk-based, intelligence-drive procedures" and selective "enhanced screening" on objects deemed high-risk. Such screening is to be undertaken either by the airlines themselves or volunteers involved in the TSA's Certified Cargo Screening Program (CCSP).

According to the TSA, CCSP allows companies to screen cargo at the point where it's packaged and bypass airport screening queues and it's supported by airlines and the air freight industries. Participation in the CCSP is open to all facilities that supply cargo to air carriers on a direct basis. It therefore includes manufacturers, distribution centres, warehouses, airport cargo handlers and third party logistics suppliers.

9.5.3 Carriage of Liquids, Aerosols and Gels (LAGs)

Restrictions on carrying liquids, aerosols and gels (commonly referred to as LAGs) in hand luggage were introduced in 2006[160] as a direct response to a plot to explode airliners over the Atlantic using liquid explosives.

Currently, within the EU there is a restriction on the amount of liquids passengers are able to take on board aircraft of 100ml. This restriction will only be lifted once airports are able to effectively screen quickly and without opening the containers.

In July 2012 the EC announced a delay to its previously announced deadline to lift the restrictions in April 2013. This was in response to results of an independent study that included results from detailed trials and surveys carried out at a number of EU airports. One of the main recommendations from the report was that the April 2013 deadline was ‘not operationally feasible’. The EC subsequently presented the report’s findings to the European Parliament’s Transport & Tourism Committee and the European Council, proposing to postpone the April 2013 deadline. This decision received support from Europe’s airports. ACI Europe stated that the decision should ultimately improve the passenger experience and safeguard the integrity of airport operations. The timing for the lifting of all restrictions will depend on the availability of technology to achieve the necessary security outcomes and that it is coordinated internationally.

The EC continues to work towards removing all restrictions on the carriage of liquids in hand luggage with the intention to apply screening as a method for controlling liquids, rather than imposing bans. Starting in January 2014, the Commission recommends that passengers should be able to carry on board all duty free LAGs provided that they are screened. To implement these recommendations, in autumn 2012, the Commission brought forward proposals to amend the existing legislation on LAGs. In the light of the experience gained and in close cooperation with its European and international partners, the Commission will then bring forward proposals for subsequent phases to achieve the final objective of screening all LAGs at the earliest possible date.

[160] Commission Regulation (EC) No 1546/2006 of 4 October 2006 amending Regulation (EC) No 622/2003 laying down measures for the implementation of the common basic standards on aviation security (OJ L 286, 17.10.2006).

In the meantime, the technology for liquid scanners continues to advance, with over twenty different Liquid Explosive Detection Systems (LEDS) that can differentiate between liquid explosives and water, have now been evaluated as meeting European Civil Aviation Conference (ECAC) performance standards under the Common Evaluation Process of Security Equipment (CEP) framework[161]. Some of these scanners are currently undergoing trials at various EU airports. A requirement sought by the industry is the ability to screen LAGs within traveller's cabin bags and not separately. This is considered essential by security and facilitation experts, given that more than 700 million departing passengers will need to be screened.

9.5.4 Security Screening

European Union

After a three-year trial period, the European Commission decided to allow "body" scanners (or security scanners as they are referred to in legislation) for full-time use. Those security systems which generate a ghost-like image of the naked body or use x-ray technology are not permitted, after health and privacy concerns. The EC permits new technology which enables the processing of images without the need for an officer to view the body outlines, and automatically generates a stick-figure diagram to illustrate to staff where to search. An example of the permitted security scanners are the ProVision Automatic Target Detection machines that are in use at Heathrow airport.

The systems were first introduced in 2009, after the failed attempt to blow up a Detroit-bound plane with an underwear bomb on Christmas day of that year.

United States

Scanner technology is developing rapidly and has the potential to significantly reduce the need for manual searches ("pat-downs") applied to passengers, crews and airport staff. The US Department of Homeland Security requested technology companies to produce a hand-held scanning device, weighing less than 5 pounds, that can determine whether a hidden object on a passenger is a weapon or explosive, to be used instead of pat-down searches on passengers who set off alarms on full-body scanners.

The US Transport Security Administration (TSA) initiative 'TSA Pre✓™' allows select frequent flyers of participating airlines and members of U.S. Customs and Border Protection (CBP) Trusted Traveler programs who are flying on participating airlines, to receive expedited screening benefits during domestic travel. Eligible participants use dedicated screening lanes for screening benefits which include leaving on shoes, light outerwear and belts, as well as leaving laptops and 3-1-1 compliant liquids in carry-on bags. After TSA validation, information is embedded into the barcodes of passengers' boarding passes, meaning that they will be eligible for faster screening in the future. The initiative will be expanded to airports across the country.

TSA confirmed that more airports are seeking to opt out of the federal government's overseeing security in favour of private screeners. Orlando Sanford International Airport is seeking to join 16 other US airports in substituting private screeners instead of the TSA's. These 16 airports include San Francisco International and Kansas City International. West Yellowstone in Montana was approved in January 2012. Legislation was signed into law, with the much-delayed FAA reauthorisation bill, in February 2012 and was designed to make it easier for airports to join the private programme.

[161] https://www.ecac-ceac.org//activities/security/cip_for_security_equipment

Australia

Following a voluntary body scanner trial undertaken at Sydney and Melbourne International Airports during August and September 2011, the Australian Government introduced body scanner screening at the country's eight international gateway airports[162] in December 2012. They were introduced as an additional layer of security that includes walk-through metal detectors, restrictions on the carriage of liquids, aerosols and gels, explosive trace detection and police presence, amongst other measures.

Hong Kong

Automated passenger document-scanning technology is in place at Hong Kong International Airport (Chek Lap Kok) courtesy of UK-based data capture specialists Access IS.

The firm's LSR110 system employs barcode readers to scan both traditional boarding passes and electronic versions displayed on cell phones. Verifying the unique bar code given to each passenger, the device provides a quicker way for travellers to steer their way from check-in areas through to security and, ultimately, aircraft boarding gates.

9.5.5 Future of Aviation Security

ICAO will continue to maintain its leadership role in aviation security, both regionally and globally.

For air cargo security, the emphasis will be on strengthening cooperation between Customs and aviation security/transport agencies to create synergies and strengthen end-to-end supply chain security and facilitation. Tighter measures will be introduced to address potential threats posed by airport, airline and cargo sector personnel. IATA's Secure Freight Program is expected to gain further recognition from governments around the world during 2013 and beyond.

IATA's Checkpoint of the Future (CoF) project is an example of a risk-based security system that aims to develop airport passenger security screening to a more sustainable, efficient and effective process that takes advantage of new technologies. A programme of trials is planned during 2013 in preparation for the first end-to-end version being implemented in 2014. A more advanced version of the CoF is planned for 2017, with the fully realised CoF arriving around 2020. This will allow passengers to walk through the screening lane without having to remove layers of clothing or separate laptops and liquids from hand luggage.

The US TSA has also identified risk-based security as the way ahead. The TSA is transitioning towards a risk-based, intelligence-driven screening system that moves away from the one-size-fits-all approach the agency adopted when it was first created. The use of advanced technology, including advanced imaging technology machines, will be used as part of the TSA's multi-layered security approach. It is acknowledged that technology alone will not be sufficient on its own. The TSA will continue its efforts to strengthen standard operating procedures, including the establishment of risk-based, intelligence-driven processes.

The EC continues to work towards removing all restrictions on the carriage of liquids in hand luggage with the intention to apply screening as a method for controlling liquids, rather than imposing bans. Starting in

[162] Adelaide, Brisbane, Cairns, Darwin, Gold Coast, Melbourne, Perth and Sydney airports

January 2014, the Commission recommends that passengers should be able to carry on board all duty free liquids, aerosols and gels provided they are screened.

The US Department of Homeland Security is planning to introduce the super-fast Picosecond Programmable Laser scanner system within the next one to two years. Using advanced laser technology, the device is able to examine both people and objects on a molecular level, to determine the presence of any chemical traces that may indicate hazardous materials.

Aviation security is entering a new phase. Security checkpoints are evolving to enable the use of advanced technologies and automation capable of screening large numbers of people and their baggage quickly, whilst at the same time providing a positive experience for passengers. Technology in all areas of aviation security continues to improve, offering both cost and facilitation benefits. Security checks will continue to be more targeted and differentiated, based on risk assessments.

10. Consumer Issues

10.1 Introduction

This chapter examines the progress of European aviation during 2012 from the viewpoint of consumers, whose main concern is how airlines and airports interact with them, particularly when unscheduled events lead to cancellations and delays.

Increasingly, the consumer is also becoming interested in all aspects of customer service from the booking process right through to their final exit at the destination airport. This includes their airport and airline experience and how their baggage is handled.

The European Union seeks to standardise these aspects of consumer concern for two reasons – to ensure that the contract between airline and consumer is fair to both parties; and to ensure that consumers across Europe are treated equally.

Section 10.2 of this chapter deals with the important aspect of airline punctuality, here regarded as being the ability of an aircraft to either depart from or arrive at the gate within 15 minutes of the advertised time. The aim is to have published information which enables consumers and regulators to have access to comparable data which will both inform consumer choice and lead to better enforcement of acceptable standards. This information should not only accord rankings to airports and airlines, but also give detailed reasons for the causes of each delay so as to be able to adopt appropriate responses. However, the amount of strictly comparable data is becoming reduced as organisations either cease collecting and publishing data, or restrict the detail made available.

Section 10.3 deals with other service aspects of concern to consumers; principally how airlines and airports deal with denied boarding, delays, cancellations and lost or damaged baggage. Concerns are increasingly being felt about the treatment of disabled passengers, the transparency of pricing information and the impact of airline failures.

Progress on each of these aspects is discussed in this section, along with relevant progress in the other main global aviation market, the United States. Note that although where necessary previous material has been included to add content, only new material for updates and progress in 2012 is presented and which was not covered in the previous edition of this series of Annual Analyses[163].

10.2 Punctuality & Delays

10.2.1 Introduction

Whilst punctuality of commercial aircraft operations is one of the key measures of airline and airport performance, consumer access to punctuality data aggregated across the EU for both airlines and airports is very limited.

[163] Annual Analyses of the EU Air Transport Market 2011, Final Report for the European Commission, Mott MacDonald, January 2012

Data reporting on a pan-European basis is primarily limited to airline de-identified monthly reports produced by EUROCONTROL's Central Office for Delay Analysis (CODA)[164], together with Network Operations monthly and annual Reports[165] on Air Traffic Management (ATM) performance from its Central Flow Management Unit (CFMU). Airline-supplied data within CODA is held under strict confidentiality and no attempt is made or permitted to identify the performance of any individual airline.

Generally, departure/arrival delays in excess of fifteen minutes are considered as a useful measure of punctuality and publicly available data series often use this time period as the measure of a flight operating on time.

Delays can occur at all points along the flight's timeline, for example:

- passenger boarding
- aircraft push-back from the departure gate
- taxiing & runway access
- en route airspace/air traffic congestion
- holding of aircraft prior to landing
- stand availability & airport infrastructure capacity (immigration, customs, baggage retrieval etc.)
- adverse weather conditions, external disruptions & special events (industrial actions etc.)

The likelihood of a flight delay is greater at times of high demand when resources and capacity are stretched and therefore more likely to impact on a greater proportion of the travelling public.

With regard to passenger rights, whilst regulation (EC) No 261/2004[166] has established common rules on compensation and assistance to passengers in the event of cancellation and long delays, there appears to be no monitoring of long delays by carrier across the EU. There are examples of individual Member States whose regulatory agencies produce national punctuality and delay statistics, such as the CAA in the UK[167] and the DGAC in France[168].

On a global basis, the FlightStats[169] platform of Conducive Technology Corp. provides both real time and historical flight information by collating actual flight time information from a variety of sources (civil aviation authorities, airlines, airports and airline reservation systems). FlightStats tracks the performance of nearly 150,000 daily flights and archives the data allowing analysis by airline, by route or by airport. The FlightStats data primarily captures airline arrival time information, without providing any information on the causes of delays.

[164] http://www.eurocontrol.int/coda/public/subsite_homepage/homepage.html

[165] http://www.eurocontrol.int/lists/publications/all-publications?type=2939

[166] Regulation (EC) No 261/2004 of the European Parliament and of the Council establishing common rules on compensation and assistance to passengers in the event of denied boarding and of cancellation or long delay of flights, and repealing Regulation (EEC) No 295/91, 11 February 2004

[167] http://www.caa.co.uk/punctuality

[168] Observatoire des retards du transport aérien, DGAC, 28 December 2011 [http://www.developpement-durable.gouv.fr/Observatoire-des-retards-du,10339.html]

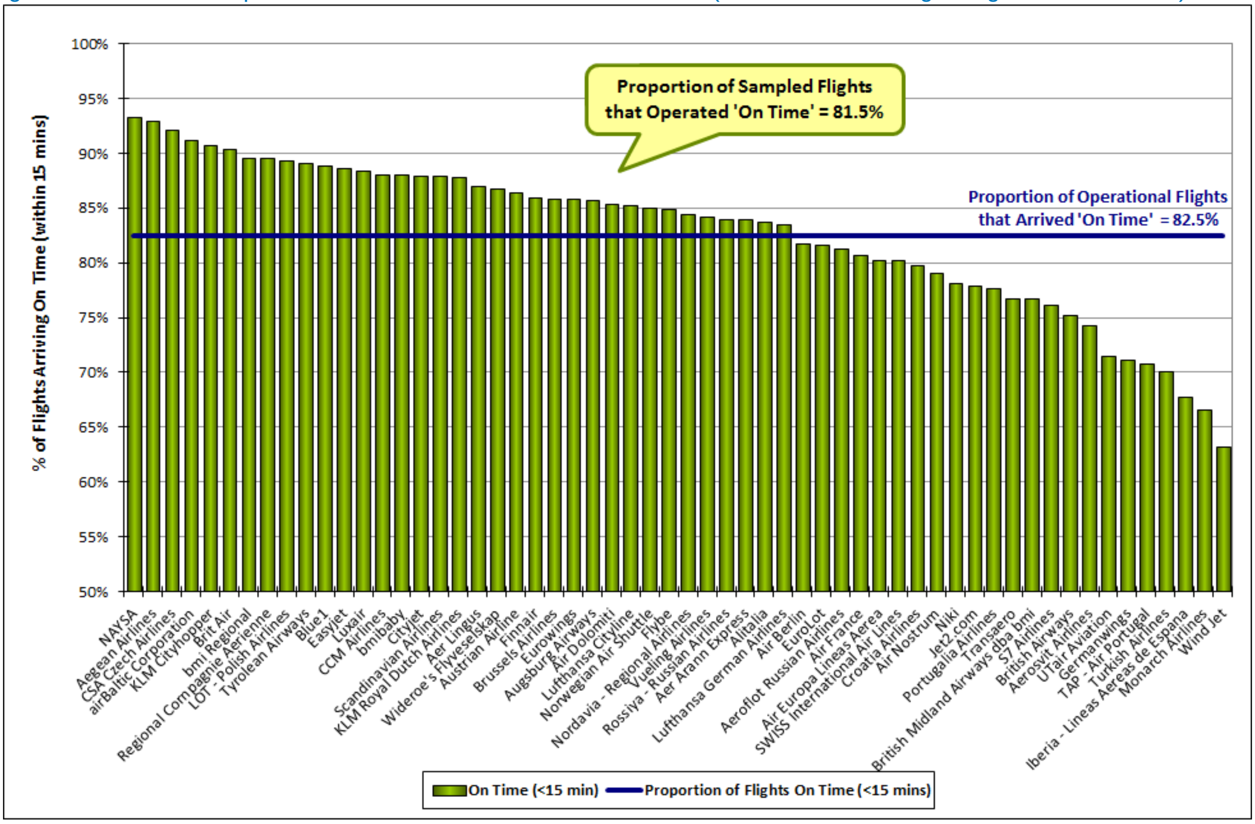
[169] www.flightstats.com

10.2.2 Airline Punctuality & Delays

European Scheduled Carriers

The figure below [Figure 10.1] reflects the annual arrival performance of European carrier scheduled flights, as sampled and reported by FlightStats[170]. Whilst the overall average proportion of all operating flights [planned flights, after excluding those cancelled & diverted] that arrived 'On Time' in 2012 was 83%, the median indicates that 85% of all scheduled flights arrived 'On Time'. Cancelled and diverted arriving flights accounted for 1.1% of total sampled flights.

Figure 10.1: 2012 European Carrier 'On Time' Arrival Performance (Scheduled Passenger Flights within 15 min)



Source: www.flightstats.com

The European carriers appearing top of the list achieving 'On Time' punctuality performance in excess of 90% of scheduled operations were NAYSA, Aegean Airlines, CSA Czech Airlines, Air Baltic, KLM Cityhopper & Brit Air. In contrast, the five carriers ranked at the bottom half of the performance table achieved overall average 'On Time' punctuality equal to 69.4%; a 22 percentage point difference vs. the ''On-Time'' punctuality of the top European performers.

The overall punctuality results indicate a 1.3 year-on-year percentage point improvement in arrival punctuality performance across all sampled operational scheduled flights. The European carriers that recorded the highest percentage point improvement versus last year are Iberia (+15.5%), Air Europa

170 2012 Year-End Report on Airport and Airline 'On-Time' Performance.pdf

(+9.1%) and Lufthansa Cityline (+8.5%). Despite Iberia's notable improvement in punctuality performance, the carrier is still positioned at the lower half of the performance table. At the opposite end of the spectrum, the airlines whose performance notably declined compared to 2011 are: Germanwings, TAP Air Portugal and Turkish Airlines, which respectively recorded a 13.7%, a 6.3% and 5.6% points decline in the share of arrival flights arriving 'On Time'.

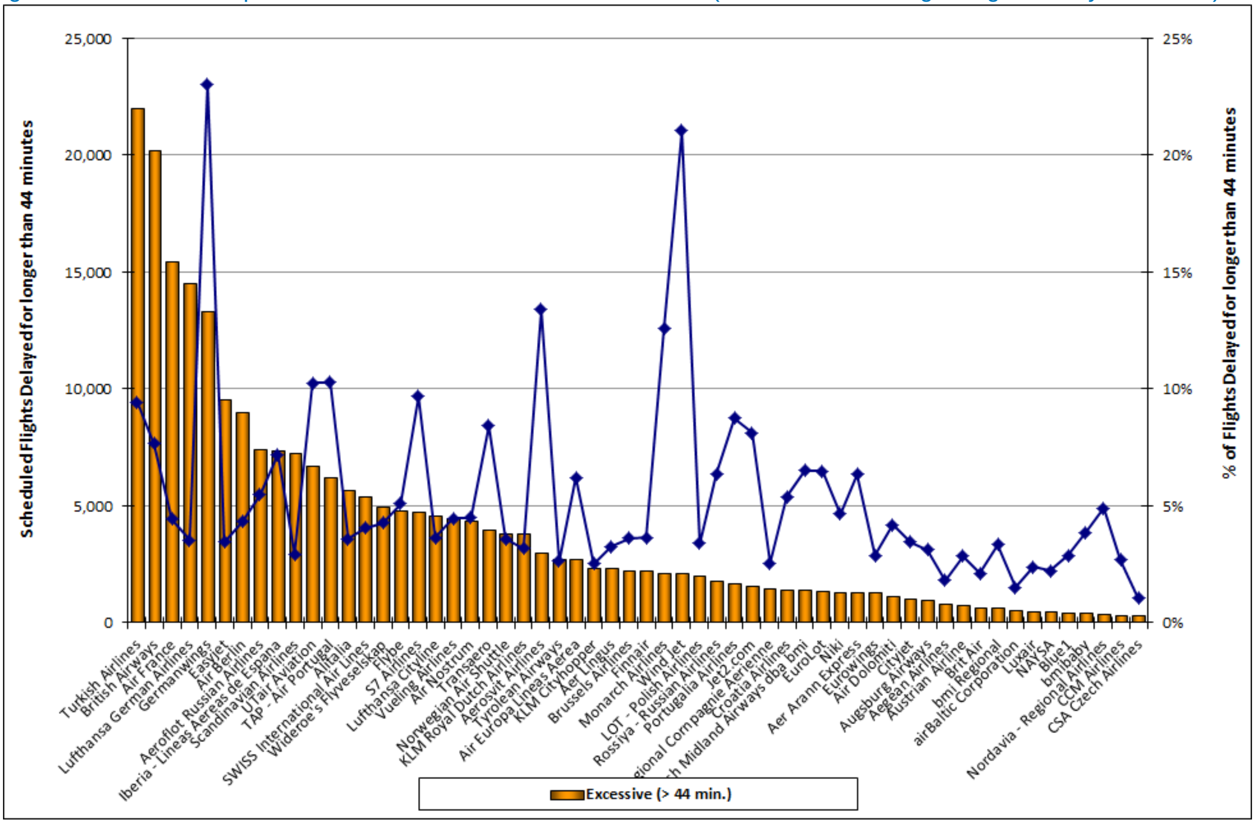
Table 10-1 below presents the list of the bottom ten performing European carriers for 2012. S7 Airlines, Turkish Airlines and Iberia appear in the lower performance rank for the second consecutive year. Other carriers with poor arrivals punctuality are British Airways (primarily based at Heathrow airport), Germanwings (German carrier), Monarch Airlines (UK based) and Wind Jet (Italian-based carrier that ceased operations in August 2012).

Table 10-1: 2012 European Carrier Bottom Ten 'On Time' Arrival Performance (Scheduled Passenger Flights within 15 min)

Ranked Performance:	Carrier Name:	Country Based in:	'On-Time' Arrival (within 15 mins) 2012
49	S7 Airlines	Russia	76.2%
50	British Airways	UK	75.2%
51	Aerosvit Airlines	Ukraine	74.3%
52	UTair Aviation	Russia	71.5%
53	Germanwings	Germany	71.2%
54	TAP - Air Portugal	Portugal	70.8%
55	Turkish Airlines	Turkey	70.2%
56	Iberia	Spain	67.8%
57	Monarch Airlines	UK	66.7%
58	Wind Jet	Italy	63.3%

In addition to data for 'On Time' arrivals (flights arriving within 15 minutes of the scheduled time), FlightStats also collects data for longer delays, cancellations and diversions. These are described in Figure 10.2 and Figure 10.3 below.

Figure 10.2: 2012 European Carrier 'On Time' Arrival Performance (Scheduled Passenger Flights Delayed >44min)

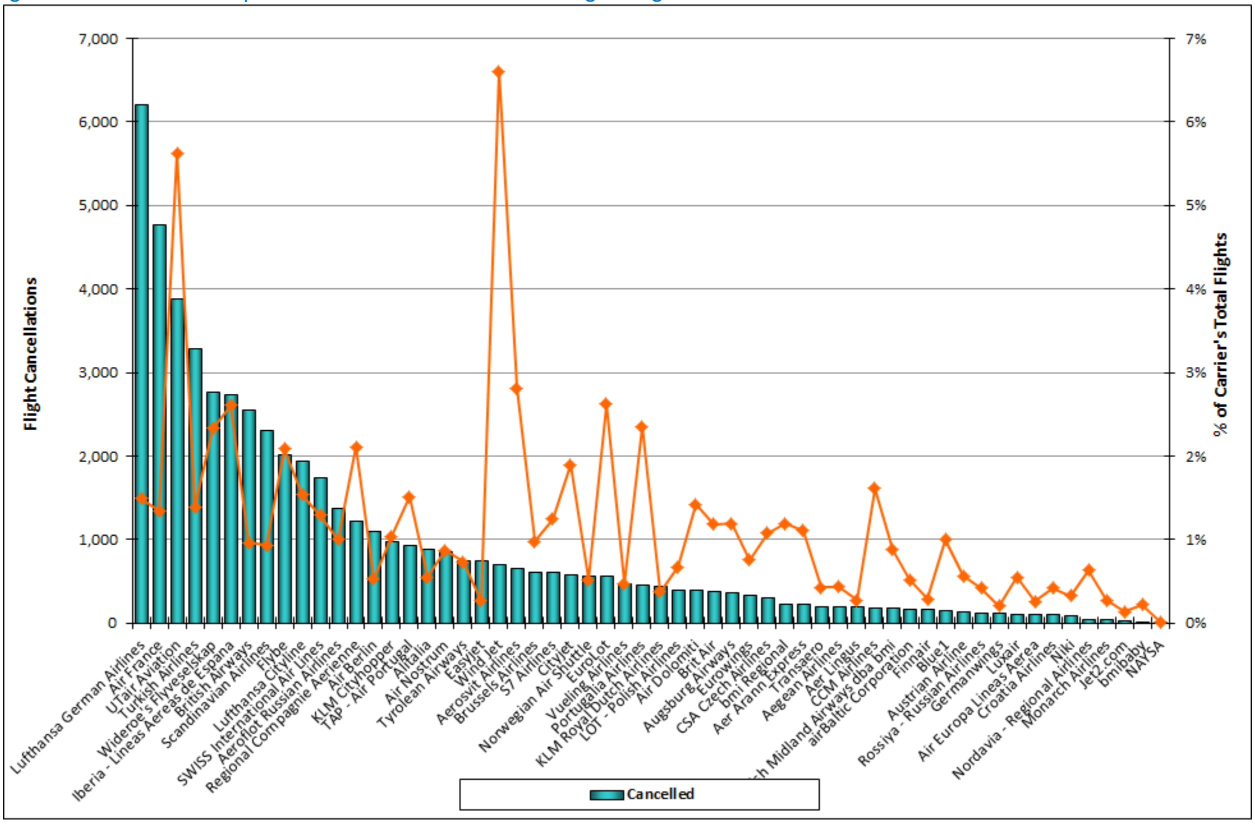


Source: www.flightstats.com

Airlines with the highest volume of long delays were Turkish Airlines (TK), British Airways (BA), Air France (AF), Lufthansa (LH) and Germanwings (4U). BA, AF and LH also appeared in the top five European carriers for 'Excessive Delays' in 2011. The first four carriers are full service network airlines operating a hub and spoke business model from major European hub airports. Airport delays can be attributed to the airports themselves due to airspace congestion in the surrounding area as well as runway and infrastructure capacity issues in some cases. However, these longer delays should be taken in the wider context of the proportion of flights operated. Of the carriers mentioned, the share of TK flights experiencing excessive delays is 9% of overall arriving flights, with the same figure for BA being at 8% of arrivals, while the excessive flights quoted for AF and LH only reflect 4% of their arriving operations. For Germanwings on the other hand, almost one in four flights arrives 44 minutes after the scheduled arrival time.

It is also worth noting that although some other carriers didn't appear high in the rank of flights with lengthy delays (> 44 minutes), the proportion of excessive delays over their overall arrivals flying programme is considerable. For instance, Wind Jet (21%), Aerosvit Airlines & Monarch Airlines (13% each), and UTAir Aviation & TAP Air Portugal (10% each) appeared to have fewer delays compared to other carriers, but with a notably high proportion of long arrival delays and in excess of 10% of their operational arrivals.

Figure 10.3: 2012 European Carrier Scheduled Passenger Flight Cancellations



Source: www.flightstats.com

A similar pattern is seen for flight cancellations (Figure 10.3), although in this case the proportion of the carrier's total sampled flights is much lower – usually less than 2% of flights are affected. The carriers with notably the highest share of flight cancellations were Aerosvit Airlines, EuroLot, Iberia and particularly Windjet and UTair Aviation (6.6% and 5.6%, respectively). In absolute terms the highest volume of cancellations were found for Lufthansa, Air France, UTair, Turkish Airlines, Widerøe and Iberia.

According to the 2012 'On-Time' Performance Awards of FlightStats.com, on a global scale All Nippon Airways achieved the lowest rate of flight cancellations (0.22%), followed closely by Finnair, El Al, Emirates and Singapore Airlines[171].

Charter Carriers

Similar data for charter flights is not available despite the fact that the significant Mediterranean charter programmes operating across Europe in summer will impact on overall total airline network punctuality. Analysis provided by flightontime.info of UK CAA data saw an improvement in long delays at reporting airports: the average delay to charter flights operating from the UK during the summer period (April to October) improved by just over two minutes (17.6 minutes) against summer 2011 when average delay accounted for 20.2 minutes. The 2012 results reflect an improvement in excess of 10 minutes against

171 http://www.flightstats.com

summer 2010 average of 28.5 minutes. Charter airline 'On-Time' performance (within 15 minutes of the scheduled departure time) improved to an average of 76.9%, a 2.6% point improvement on summer 2011 and a 12% point improvement vs. 2010 levels. Summer season 2012 punctuality for the three largest charter companies in the UK was recorded at 77.9%, a 2% and 12% point improvement against 2011 and 2010 levels, respectively. This result is marginally above the charter industry average, with these operators representing almost 90% of total charter movements. The top performing charter carrier experienced a 6 minute improvement in performance compared with summer 2011 with the average delay reducing to 11.25 minutes, and the volume of flights 'On Time' from the same carrier soaring to 82.2%.

Table 10-2: Summer 2012 UK Charter Airline Punctuality (April to October)

		Average Delay (mins)		OTP (%)		1 hour+ late (%)		3 hours+ late (%)		Total Flights Analysed		Change in average delay YoY (%)
Rank	Airline	Apr-Oct 12	Apr-Oct 11	Apr-Oct 12	Apr-Oct 11	Apr-Oct 12	Apr-Oct 11	Apr-Oct 12	Apr-Oct 11	Apr-Oct 12	Apr-Oct 11	
1	Thomson Airways	11.3	17.3	82.2	77.1	3.7	6.9	0.6	1.7	28,326	28,401	-35.1%
2	Thomas Cook Airlines	26.1	19.8	72.9	75.6	11.7	8.8	3.2	1.9	18,757	21,215	31.9%
3	Monarch Airlines	28.3	22.0	65.1	70.5	10.4	8.1	2.8	2.0	2,081	5,968	28.6%
Average (above 3 airlines)		**17.6**	**18.6**	**77.9**	**76.0**	**7.1**	**7.7**	**1.7**	**1.8**	**49,164**	**53,218**	**-5.3%**
Average (all charter flights)		**18.0**	**20.2**	**76.9**	**74.3**	**7.2**	**8.3**	**1.7**	**1.9**	**54,754**	**60,167**	**-10.8%**

Source: www.flightontime.info (Notes: OTP = 'On-Time' Performance, % of flights operating early, on time or up to 15 mins late. All charter flight movements (arrivals & departures) were analysed at ten UK reporting airports for each airline, except where a small number of flights were operated which were excluded from the analysis, as follows (exclusions apply to 2012 season): Monarch Airlines GLA (16), EDI (4), NCL (14), STN (7). UK reporting airports are BHX, EDI, GLA, LCY, LGW, LHR, LTN, MAN, STN & NCL.

UK Data

Looking in more detail at scheduled operators in the UK, of the five largest airlines in terms of movements sampled[172], the five best performers in terms of the proportion of flights departing within 15 minutes of scheduled departure time were easyjet at 84.3% (+2.5% point YoY), Flybe (-1.6% point YoY) and Ryanair (-1.9% point YoY) both at 83.3%, Lufthansa at 77.6% (+4.6% point YoY) and British Airways 75.6% (-4.1% point YoY)[173]. As per the findings, only two of the five carriers saw improvements compared to their 2011 annual performance, with Lufthansa seeing the largest rise from 74.3% in 2011 to 77.6% of 'On Time' flights in 2012. British Airways on the other hand recorded a notable decline in 'On Time' performance, whilst TAP Air Portugal achieved the biggest punctuality drop at 10% point vs. last year.

Continuing last year's strong punctuality performance, the regional airlines bmi Regional and CityJet (incl. VLM) lead the overall punctuality performance table with 93.9% (+2.2% point YoY) and 89.8% (+0.6% point YoY) departures 'On Time', respectively. Loganair's flight delay performance slightly declined vs. last year (87.9% in 2012, -0.5% YoY), with the airline now positioned fourth in the 2012 overall airline average delay

[172] As reported at www.flightontime.info; carriers with more than 40,000 annual departures. Figures for January to December 2012.

[173] Note this data is for departure delays and is not directly comparable with the flightstats arrival delay data presented earlier

report. Of the low cost carriers operating from the UK, bmibaby was the best performer in 2012 with 86.4% (+2.6% YoY) of flights departing within 15 minutes, while Jet2 was the worst performer with 72.6% of departures within 15 minutes of the scheduled time, despite a notable (+11.9% point YoY improvement in delay performance). Iberia remains at the lower half of the performance table with 66.6% of flights departing within 15 minutes. Despite a 9.8% point increase vs. last year Iberia is now positioned fourth from the bottom of the performance table ahead of Air Canada (65.3%, -2.5% point YoY), Emirates (64.2%, no change YoY) and Monarch Scheduled (63.4%, -7% point YoY).

On UK scheduled flights, although the overall average delay (minutes) increased in 2012 to 11.45 minutes (+7.2% point vs. LY), the overall average still reflects a 32% reduction against 2010. Following last year's trend and in contrast to scheduled flights, the average delay (minutes) for charter carriers marginally improved in 2012 at 18.03 minutes (-12% point YoY vs. 20.2 minutes LY), reflecting a 58% reduction in the 2010 overall average delay figure of 28.52 minutes.

Regional Carriers

The European Regions Airlines Association (ERA) publishes punctuality statistics for its (generally smaller) member airlines. For the second consecutive year, Montenegro Airlines (YM) achieved the best punctuality, with 98.3% of YM's flights recorded to depart on time (within 15 minutes) during the period of Jan-Dec 2012. On the other hand, Air Iceland has now moved to the bottom of the performance table, with only three quarters of its flights (75.3%, -13.5% point YoY) operating ''On-Time''. Although Sky Work Airlines noted the largest improvement (+10 minutes YoY) across all ERA members the airline is still positioned in the lower half of the table based on the proportion of flights departing on time (+12.7% YoY), one position up from Air Iceland[174]. Air Alps Aviation and Binter Canarias remain for the third year in the top three of the regional performance table on departing punctuality following Montenegro Airlines.

Situated in the Balkans on the Adriatic coast, the national carrier of Montenegro has a small fleet and network characteristics of a regional airline. It operates five Fokker 100s and three Embraer 195s on nine routes to European destinations from its main base at Podgorica Airport. Air Iceland on the other hand is based in Reykjavík airport, operating scheduled services to domestic destinations, to neighbouring Greenland and the Faroe Islands on six Fokker 50s and eight Bombardier Dash 8-200 series. Whilst SkyWork Airlines AG is a Swiss airline based at Bern airport, operating to twenty four destinations, 92% of which are in Europe and the remaining 8% in Tunisia; North Africa. Sky Work Airlines' fleet is composed of one Bombardier Dash 8 Q400 series and five Dornier 328-110s.

The statistics shown in Table 10-3 reflect 2012 departing punctuality performance on individual regional carriers, as extracted from the 'Airline and Airport Monthly Statistics' Library section of the ERA website. Please note that some of these carriers are also surveyed by FlightStats whose arrival punctuality results can be found under **Section 10.2.2** above.

174 http://www.eraa.org/library/statistics/cat_view/104-library/72-statistics/179-airline-and-airport-monthly-statistics/503-2012

Table 10-3: Departing Punctuality of Individual ERA Carriers 2012

	Number of flights operated	% Flights On Time	% chg 12/11	% Flights within 60 mins	% chg 12/11	Regularity (%)	% chg 12/11
Aegean Airlines	51,616	91.8	5.4	99 0	2.2	100.0	0.0
Aer Arann	25,763	82.6	-0.2	94.8	0.4	99.1	0.8
Air Alps Aviation	2,183	95.4	1.8	99.3	1.6	98.6	-0.1
Air Iceland	10,647	75.3	-9.6	93.5	-2.6	92.6	-0.5
Air Nostrum	99,176	85.8	7.3	98.0	2.4	99.2	0.1
airBaltic	46,781	89.0	0.5	98.8	0.2	99.6	0.0
Binter Canarias	49,096	94.9	0.9	99.3	0.6	99.3	0.1
Braathens Regional	27,659	90.2	3.1	96.3	2.2	98.9	0.1
Carpatair	9,029	79.5	-4.6	93.7	-0.7	86.1	-5.1
CityJet	44,530	87.9	0.3	97.8	-0.1	98.5	-0.3
Darwin Airline	10,186	86.8	1.9	96.2	-0.3	98.7	-0.3
Eastern Airways	20,795	85.1	-4.2	95.1	-1.8	98.5	-0.1
Estonian Air	19,517	83.9	-7.6	97.1	-0.3	98.3	-0.7
Malmo Aviation	17,713	87.7	-3.8	97.4	-1.0	99.3	0.1
Montenegro Airlines	8,059	98.3	0.6	99.9	-0.1	97.4	-0.2
Olympic Air	53,994	93.4	2.5	98.3	0.2	98.2	-0.2
PGA Portugalia Airlines	26,003	79.5	-3.0	93.3	-1.9	98.5	0.1
Regional	84,800	89.4	-0.2	98.3	-0.3	98.2	-0.5
SATA Air Azores	14,407	88.5	0.9	97.3	0.9	96.7	0.0
Sky Work Airlines	9,511	78.5	11.4	98.1	3.8	99.0	0.4
Wideroe	120,957	87.0	0.6	97.3	0.3	96.4	0.4

Source: ERA Business Databank (January to December 2012)

Aegean Airlines was recognised in the FlightStats 'On-Time' Performance Service (OPS) Awards[175] as achieving the best arrival performance amongst other regional European airlines for 2012, as the airline was placed first in the departures punctuality category. This result, along with other highlights on the punctuality performance of regional carriers around the globe compared to major carriers can be found in Table 10-4 below. The best punctuality of any major European airline was awarded to LOT Polish (at 92.3%), noting a performance placing the carrier 5% points ahead of the best major North American carrier (Alaska Airlines at 87.3%), whilst reflecting a marginally better performance (+2%) against the best major Asian carrier (Japan Airlines at 90.4%).

When comparing the 2012 OPS 'On-Time' Arrival' performance award statistics against the previous year, an improvement is found across all categories (the major European Airlines recorded the biggest improvement, +4.1% point YoY). However, the North American Major and Regional best performing carriers showed a marginal YoY decline, at -0.5% and -0.3% point, respectively.

[175] Based on FlightStats data for the full year 2012

A set of new categories were added to this years' 'On-Time Performance Awards' list, highlighted in blue at Table 10-4 below. This includes an award for the 'Lowest Global Cancellations' (All Nippon at 0.22%) and awards for the best performing carriers in the regions of Middle East & Africa (South African at 91.2%), the Pacific (Air New Zealand at 87.8%) and South America (Azul at 80%). As per 2012, the OPS Awards categories also expanded and now recognise the best performing 'Airline Alliance' (oneworld at 79.6%), and the best performing 'Network Global Airline' (All Nippon at 86.5%).

Table 10-4: FlightStats Best 'On-Time' Performance Awards 2012

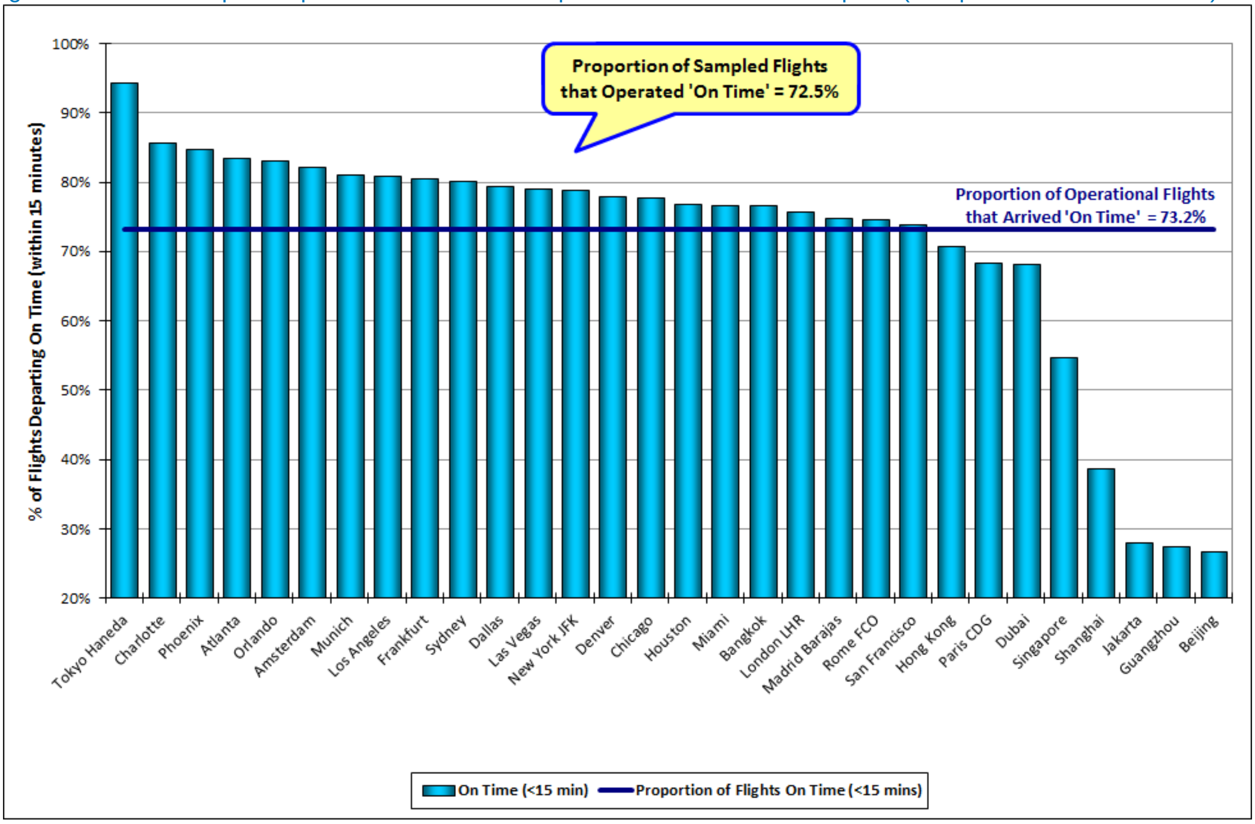
Category	Best Carrier	'On-Time' Arrival (within 15 mins)	Other Finalists	
Major International Airlines	Japan Airlines	90.4%	• All Nippon Airways • SAS (Scandinavian Airlines)	• KLM • Air New Zealand
Major North American Airlines	Alaska Airlines	87.3%	• AirTran Airways • US Airways	• Delta Airlines • jetBlue
Major European Airlines	LOT Polish Airlines	92.3%	• SAS (Scandinavian Airlines) • KLM	• Aer Lingus • Malaysian Airlines
Major Asian Airlines	Japan Airlines	90.4%	• All Nippon Airways • Korean Air Lines	• Singapore Airlines • Malaysian Airlines
Regional North American Airlines	Hawaiian Airlines	92.3%	• Horizon Air • Compass Airlines	• Mesa Airlines • American Eagle
Regional European Airlines	**Aegean Airlines**	**93.0%**	• **KLM Cityhopper** • **Brit Air**	• **Regional Companie Airienne** • **Tyrolean Airways**
Regional Asian Airlines	**J-Air**	**92.6%**	• **ANA Wings** • **Japan Air Commuter**	• **JAL Express** • **Japan Transocean Air**
Lowest Global Cancellations	All Nippon Airways	0.22%	• Finnair • El Al Airlines	• Singapore Airlines • Emirates
Major Middle East & Africa Airlines	South African Airways	91.2%	• Gulf Air • Saudi Arabian Airlines • Qatar Airways	• Etihad Airways • Emirates
Major Pacific Airlines	Air New Zealand	87.7%	• Qantas Airways • Virgin Blue Airlines	• Jetstar Airways
Major South America Airlines	Azul Brazilian Airlines	80.0%	• Lan Peru • Copa Airlines Colombia	• TAM Linhas Aereas • Gol Transportes Aereos
Airline Alliance	oneworld	79.6%	• Star Alliance • SkyTeam Alliance	
Network Global Airlines	All Nippon Airways	85.5%	• Japan Airlines • Delta Airlines	• Alitalia • SAS (Scandinavian Airlines)

Source: FlightStats Ops Awards website (http://www.flightstats.com/company/media/'On-Time'-performance-awards/)

10.2.3 Airport Punctuality & Delays

In previous years AEA statistics have given an insight into airport punctuality across Europe, albeit limited to its airline members, but since 2009 such data is no longer available. However, FlightStats produces an analysis for the top 30 worldwide airports on a monthly basis as well as an annual analysis[176] collating data from those airlines that provide punctuality statistics. This is reflected in Figure 10.4. To reiterate, the data is based on the sampling of reporting airlines and is not a complete record of punctuality of all scheduled carriers operating at a given airport.

Figure 10.4: 2012 Airport Departure Performance Report for World's Busiest Airports (Sampled Scheduled Airlines)



Source: www.flightstats.com

In 2010, no European airports appeared in the top twenty; in 2011 this situation improved with London Stansted coming second after top global performer Tokyo Haneda, with Amsterdam and Munich also recording significant improvements. In 2012, the list was amended to reflect performance results from the top 30 world airports (vs. the top 50 in the previous years). In 2012, the main network carrier European hub airports (Amsterdam, Frankfurt, Heathrow, Paris CDG and Madrid) achieved between them an average ''On-Time'' departure punctuality of 76.3%. This reflects a collective improvement of 2.7% point on 2011, and 8.9% vs. 2010. The best European 'hub' performance was achieved by Amsterdam for the second consecutive year, with 82.3% (+1% point YoY) of departures on time. The four airports achieving the highest YoY improvement in punctuality performance on departing flights out of major North American Airports were: Miami (+21.5% points YoY), Dallas (+21.3% points YoY), Chicago (+13.2% points YoY) and

[176] 2012 Year-end Report on Airport and Airline 'On-Time' Performance, FlightStats, 4 January 2013

New York JFK (+9.8% points YoY). In contrast, departure punctuality significantly declined for the major South East Asian airports of Jakarta (-57% points YoY), Guangzhou (-11.6% points YoY), Beijing (-7.8% points YoY) and Bangkok (-7.2% points YoY).

Concentrating now in the UK market, the CAA punctuality statistics for ten UK airports for the full year 2012[177] indicate a 0.56% point reduction in overall 'On-Time' performance, whilst a 5% point Year-on-Year increase was evident in delays across airports in the UK, implying that UK airport punctuality levels marginally dropped in 2012. Overall, 79.6% of flights in 2012 operated on time vs. 80.1% in the previous year. In addition, the average delay time recorded for 2012 was 12.1 minutes, 0.5 minutes more when compared to the 2011 equivalent (11.6 minutes). Nevertheless, the 2012 punctuality performance reflects a notable improvement against 2010, with the proportion of UK flights operating on time improving by 7.8% points (72.3% in 2010) and average delay time improving by just over 32% (2010 delay time 17.8 minutes).

It is important to note that the data being reported in this section is airline delay data. An airport may appear to be performing poorly in the league table merely because it is served by poorly performing airlines. In addition, delays at airports can be due to a number of reasons, some of which may be under the control of the airport (e.g. preparedness for snow), but some not. For example in the UK, London Heathrow and London Gatwick are recognised as the most efficient dual and single runway airports in the world, respectively, operating at near full capacity. However, their delay performance is generally poor relative to other large airports. Due to environmental concerns, the policy of successive UK Governments has not allowed any increases in runway capacity at these airports; and airlines accept the resulting delays in order to achieve the near 100% throughput. This is, of course, of no consolation to air passengers.

A further factor to consider when comparing any traffic-related data against 2010 is the impact of the April 2010 Eyjafjallajökull volcanic eruption in Iceland and the resulting ash cloud crisis, combined with severe winter weather in December 2010, which forced significant cancellations and delays across Europe; thus improvements seen in performance in data on subsequent years will have benefited from this effect.

10.3 Consumer Protection

10.3.1 Introduction

The EU defines the main air passenger rights as covering the following issues:

- People with disabilities and people with reduced mobility (Section 10.3.2)
- Denied boarding (Section 10.3.3)
- Cancellation (Section 10.3.4)
- Long delays (punctuality) (Section 10.3.5)
- Baggage (Section 10.3.6)
- Identity of the airline (Section 10.3.7)
- Protection against airline insolvency (and package holidays) (Section 10.3.8)
- Price transparency (Section 10.3.9)

[177] CAA- UK Punctuality Statistics: 2012 [http://www.caa.co.uk/default.aspx?catid=80&pagetype=88&sglid=12&fld=2012]

Progress in each of these various issues is analysed in this section.

Review of Passenger Rights Legislation

Early in 2010 the Commission carried out a public consultation on Air Passenger Rights[178] in order to gather opinions from national authorities, stakeholders, citizens and private and public organisations on the existing or perceived problems and preferred solutions with regard to five pieces of European legislation in the field of air passenger rights:

- Regulation (EC) No 889/2002, which transposed the Montreal Convention[179] into EU Law ('the Liability Regulation') which covers liability for lost, damaged and mishandled luggage;
- Regulation (EC) No 261/2004 ('the APR Regulation') establishing rules for compensation and assistance to passengers in the event of denied boarding, cancellation or long delay;
- Regulation (EC) No 1107/2006 on the rights of passengers with reduced mobility ('the PRM Regulation');
- Regulation (EC) 1008/2008 on common rules for the operation of air services in the EU; and
- Directive 96/67 on the conditions for access to ground-handling markets.

The results of this consultation were published in July 2010:
http://ec.europa.eu/transport/themes/passengers/consultations/2010_03_01_apr_legislation_en.htm.

In September 2010 the Commission published a report by an external consultant which examined the enforcement of rules by individual Member States and the application of penalties for infringements, initially in respect of Regulation 1107/2006 on the rights for people with reduced mobility. The results show that even four years post application, the Regulation was not fully implemented across the EU, with some Member States having not yet adopted (or enforced) penalty rules for infringement of the Regulation, while others imposed penalties only in some specific cases (not for all infringements under the Regulation)[180].

The 2010 study served as input to the **Commission Communication of 11 April 2011**[181] which reported on the varying interpretation being taken on the Regulation's provisions, due to grey zones and gaps in the current text, and the non-uniform enforcement across Member States. It further pointed towards the difficulties that passengers encounter in seeking to enforce their individual rights.

A public consultation was carried out between 19 December 2011 and 11 March 2012 which focussed on questions with regard to a possible revision of Regulation 261/2004. 410 submissions to the consultation were received.

[178] http://ec.europa.eu/transport/passengers/consultations/2010_03_01_apr_legislation_en.htm

[179] Convention for the Unification of Certain Rules for International Carriage by Air, Montreal, 28 May 1999

[180] EC TENDER TREN/A3/448-2009 on the "Assessment on rules on penalties applicable to Regulation infringements 1107/2006, concerning the rights of disabled persons and persons with reduced mobility when travelling by air", Philippe & Partners, 24 September 2011

[181] Communication from the Commission to the European Parliament and the Council on the application of Regulation 261/2004 establishing common rules on compensation and assistance to passengers in the event of denied boarding and of cancellation or long delay of flights (http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0174:FIN:EN:PDF). COM (2011) 174 final

On 29 March 2012, the **European Parliament (EP)** adopted a resolution182 on the functioning and application of established rights of people travelling by air, in response to the above mentioned Commission Communication. The EP believes that proper application of the existing rules by Member States and air carriers, enforcement of sufficient and simple means of redress and providing passengers with accurate information concerning their rights should be the cornerstones of regaining passengers' trust. The EP regrets that the enforcement bodies set up by the Member States do not always ensure effective protection of passenger rights, to the detriment of air passengers. With regard to the upcoming revision of the Regulation, the EP asks the Commission to clarify the passengers' rights, in particular the notion of 'extraordinary circumstances' and the rules governing the provision of assistance and the right to redress and compensation.

On 30 May 2012, the Commission and the European Economic and Social Committee[183] held a conference where stakeholders and industry representatives commented on the results of the public consultation. Poor compliance and inadequate enforcement of financial compensation in case of delay were the main points raised by the consumer and passenger representatives. The results of the public consultation can be consulted here: http://ec.europa.eu/transport/themes/passengers/consultations/2012-03-11-apr_en.htm.

On 13 March 2013, the Commission adopted a proposal for the revision of the air passenger rights. More information on the proposal can be found here: http://ec.europa.eu/commission_2010-2014/kallas/headlines/news/2013/03/passenger-rights-air-revision_en.htm.

10.3.2 People with Disabilities & People with Reduced Mobility (PRMs)

Under current EU legislation, people with disabilities and of reduced mobility are protected from discrimination during reservation and boarding. They are also entitled to receive assistance free of charge at EU airports (on departure, on arrival and in transit) and on-board aircraft. In order to facilitate the provision of assistance, Regulation 1107/2006 requires that passengers pre-notify their needs at least 48 hours prior to the flight.

Following an assessment of the Regulation, which was accompanied by an additional study in September 2010 examining enforcement amongst Member States[184], the Commission issued a report based on both studies to the European Parliament and Council in April 2011[185]. The report showed that the Regulation has brought advantages to PRMs; in particular through a single framework of protection, a clear division of tasks between airports and air carriers, and the establishment of a network of National Enforcement Bodies (NEBs) in all Member States.

The Commission concluded that the overall impact of the Regulation was positive and a legislative review was not necessary, despite that a number of enforcement difficulties were recognised which might weaken its impact. A number of improvements were proposed, including:

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[182] European Parliament resolution on the functioning and application of established rights of people travelling by air, 2011/2150(INI), http://www.europarl.europa.eu/sides/getDoc.do?type=TA&language=EN&reference=P7-TA-2012-99

[183] Stakeholder conference on Air Passenger Rights [http://ec.europa.eu/transport/passengers/events/2012-05-30-stakeholder-conference_en.htm]

[184] EC TENDER TREN/A3/448-2009 on the "Assessment on rules on penalties applicable to Regulation infringements 1107/2006, concerning the rights of disabled persons and persons with reduced mobility when travelling by air", Philippe & Partners, 24 September 2011

[185] REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL on the functioning and effects of Regulation (EC) No 1107/2006 of the European Parliament and of the Council of 5 July 2006 concerning the rights of disabled persons and persons with reduced mobility when travelling by air, COM(2011) 166 final, 11 April 2011

- a uniform interpretation of the Regulation;
- improving how the regulatory instruments work in practice;
- strengthening the efficacy of the penalties and their supervision by national authorities; and
- addressing the issue of the transport and supply of medical oxygen.

  The Regulation covers travellers at all EU airports and the operations of EU carriers anywhere in the world. They also cover non-EU carriers within or leaving Europe.

In early 2012, the EC published a document titled 'Interpretive Guidelines' to clarify unclear issues in the PRM Regulation (1107/2006) and to improve its application'[186]. The IATA, Airlines for America (A4A), ACI-North America, the Regional Airline Association and the Air Carrier Association of America submitted a joint memorandum[187] commenting on the impracticality of some of the proposed interpretations of the existing rules, suggesting that the wording is viewed as being 'restrictive' (providing for only one method of compliance for kiosks and websites). The IATA Regional VP for North America proposed for the regulation to be enforced at a policy level, thus allowing the industry to set out best practises towards meeting the required standards. In addition, the IATA Common Use Working Group reviewed the proposed self-service kiosk[188] accessibility features and provided extensive information on the research, redesign, and reprogramming required towards a revamped kiosk and proposing that the IATA Group becomes instrumental in providing input on industry standards.

Although in June 2012 the EC announced it would not make any legislative changes relating to PRMs[189], in a press release dated June 2012[190], the Commission raised the concern that unfair refusals for disabled air travellers are 'still a problem', with the Vice President Sim Kallas, commenting that "… if you [disabled passengers] want an easier journey, tell them in advance that you are coming". Kallas was referring to the regulation guidelines which suggest that 1) passengers pre-notify of the required level of assistance at least 48hours before the published time of departure, 2) passengers report recurring refusal problems and inconsistent requirements for medical certificates and for passengers to be accompanied and 3) passengers report problems with medical & mobility equipment.

Later that month, the 'Interpretive Guidelines' were published[191] after a detailed assessment of the Regulation and discussion with national authorities and other interested parties (air transport industry, consumer representatives and representatives of persons with disabilities or reduced mobility). More specifically, ABTA raised awareness through the production and distribution of the 'Pre-notification guidance' working paper[192]. This document was issued in July 2012, demonstrating that "improvements to the pre-notification process could benefit passengers and ensure they received a better service", while

[186] COMMISSION STAFF WORKING DOCUMENT on the application of Regulation (EC) N° 1107/2006 of the European Parliament and of the Council of 5 July 2006 concerning the rights of disabled persons and persons with reduced mobility when travelling by air [http://ec.europa.eu/transport/themes/passengers/air/doc/prm/2012-06-11-swd-2012-171_en.pdf]

[187] All Passengers This Way: In the absence of a global standard governing accessibility for passengers with disabilities, new regulations threaten to further confuse matters

[http://www.iata.org/publications/airlines-international/april-2012/Pages/accessibility.aspx]

[188] Kiosk: a service counter found in commercial airports used to processing passengers primarily for self-service check-in and baggage drop-off operations

[189] http://www.abta.com/news-and-views/policy-zone/more/passenger-rights

[190] Passenger rights: unfair refusals 'still a problem' for disabled air travellers says Commission

[http://europa.eu/rapid/press-release_IP-12-602_en.htm]

[191] Passenger Rights: Persons with reduced mobility (PRM) - legislation in force since 2007 [http://ec.europa.eu/transport/themes/passengers/air/prm_en.htm]

[192] Pre-notification guidance for supporting passengers with a disability or reduced mobility

[http://www.abta.com/resource-zone/publication/pre-notification-guidance-for-supporting-passengers-with-a-disability-or-re] aiming to “support all involved when serving disabled passengers and persons with reduced mobility in providing a comprehensive service to their customers, and encouraging them to identify any specific assistance needs when making a booking”.

The guidance suggests that during the booking process all passengers should have access to information allowing them to assess the level of assistance they feel necessary, but also be able to provide information on and pre-notify for the required level of assistance without additional costs. Information on airport layout and walking distances are vital in assisting passengers to plan their journey and consider the level of assistance they feel necessary, whilst passenger rights and the responsibility to pre-notify are clearly explained. Passengers should have access to the right means for doing so (via telephone or online) via booking websites that include several clear links and notifications to PRM information and assistance pre-book sections, which is reflected using relevant terminology such as Special Assistance, Mobility or Passenger Assistance. The paper also proposes the use of reminders for assistance requirements when passengers make telephone bookings and looking at travel brochures. Moreover, the guidance suggested that the pre-booking assistance service is a free service, whilst advocating the important role of travel agents in encouraging passengers to provide such information. Post-booking and with the likelihood to improve passenger confidence, the working paper proposes the provision of confirmation that the passenger request for assistance has been received, and where possible for this message to also include details of where the passenger should go on arrival at the airport.

The rights of PRMs are further strengthened when they experience situations of denied boarding, cancellation or long delay. Article 11 of Regulation (EC) 261/2004 states that PRMs and any persons accompanying them, as well as unaccompanied children, have the right to care in accordance with Article 9 of Regulation (EC) 261/2004 (‘right to care’, which specifies those items or assistance offered to passengers free of charge), “as soon as possible”.

10.3.3 Denied Boarding

EU legislation protects passengers who have booked flights and are denied seats on those flights without reasonable grounds and against their will. When passengers are denied boarding on a flight, airlines are first obliged to seek volunteers to surrender their reservation in exchange for certain benefits agreed with the passenger[193]. In addition, the air carrier must also offer volunteers the choice between a full refund and re-routing[194]. When there are insufficient volunteers, passengers who are denied boarding against their will are additionally entitled to compensation of between €250 and €600[195], depending on the distance (km) of the flight; and to care (phone call, refreshments, food, accommodation and transportation to and from the accommodation)[196] while waiting to be re-routed.

Furthermore, the CJEU issued two judgments on 4 October 2012[197] which clarify that it is not only in cases of overbooking that compensation may be due to passengers refused on board. Indeed, grounds that are not linked to the personal situation of the passenger, such as the occurrence of extraordinary circumstances such as a strike, or a late arrival of passengers at a connecting airport so the airline gave their seats away to other passengers, are not reasonable grounds that exempt the carrier from providing assistance and from the payment of compensation.

[193] Article 4 of Regulation 261/2004

[194] Article 8 of Regulation 261/2004

[195] Article 7 of Regulation 261/2004

[196] Article 9 of Regulation 261/2004

[197] C-22/11, *Finnair* and C-321/11, *Rodríguez Cachafeiro and Martínez-Reboredo Varela-Villamor*.

At the stakeholder conference held in Brussels (30 May 2012) on the possible revision of Regulation 261/2004[198], the requirement of a clearly defined Regulation to ensure better understanding and enforcement was stressed by the Consumer representatives. On the matter of denied boarding, the new rule proposed by the EC and explained under the 'Air Passenger Rights Revision – FAQs' (**Section 1.3.1**) introduces the rule that a passenger may not be denied boarding on the return flight of his ticket on the grounds that he did not take the outbound part of the return ticket. Under the same proposal, passengers now have the new right of being able to request – free of charge – the correction of spelling mistakes in his name, up to 48 hours before departure.

10.3.4 Cancellation of Flights

If flights are cancelled, passengers are entitled to identical compensation offered in the case of denied boarding, unless they were informed of the cancellation at least 14 days before the planned departure, or they were re-routed close to the original scheduled times, or unless the airline can prove that the cancellation was caused by extraordinary circumstances.

In addition to the compensation under Article 7, the airline must offer the passenger a choice between:

- reimbursement of the full cost of the ticket within seven days; or
- rerouting to the final destination under similar conditions;
- and if necessary, care (phone call, refreshments, food, accommodation and transportation to and from the accommodation) while waiting for the re-routing.

A number of 'grey' legal areas arose in 2011 when the European Court of Justice (ECJ) was faced with a number of court cases from passengers[199,200] and airlines[201] alike on flight cancellations and right to compensation under Regulation 261/2004.[202]

On October 2011, the ECJ confirmed that a 'cancellation' does not refer exclusively to a situation in which the aircraft fails to take off at all, but also covers any case in which the aircraft departed but, for whatever reason, was subsequently forced to return to the airport of departure where its passengers were transferred to other flights[203]. The Regulation seeks to achieve a level playing field in this respect by stating in Article 4 that an operating air carrier shall not be obliged to pay compensation in accordance with Article 7 if it can prove that the cancellation is caused by extraordinary circumstances which could not have been avoided, even if all reasonable measures had been taken[204]. The Montreal convention allows for a similar, although not identical, defence.

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[198] http://ec.europa.eu/transport/themes/passengers/consultations/doc/2012-03-11-apr-public-consultation-results.pdf

[199] Examples of 'further compensation': additional transport &assistance costs incurred after being rerouted the following day to a different destination airport than that originally intended, or additional kennel costs incurred from keeping a pet longer than planned

[200] Advocate General's Opinion in Case C-83/10, Sousa Rodriguez and others v Air France, Court of Justice of the European Union, 28 June 2011 [http://curia.europa.eu/jcms/upload/docs/application/pdf/2011-06/cp110064en.pdf]

[201] Case C-12/11: Reference for a preliminary ruling from Dublin Metropolitan District Court (Ireland) made on 10 January 2011 — Danise McDonagh v Ryanair Ltd [http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2011:080:0014:02:EN:HTML]

[202] The Regulation was tested when the rulings issued faced criticism as being "an extreme pro-consumer opinion that will likely increase airlines' costs associated with the [Regulation]", ECJ advocate general calls for defining 'passenger compensation' more broadly, ATW Online, 29 June 2011 [http://atwonline.com/international-aviation-regulation/news/ecj-advocate-general-calls-defining-passenger-compensation-mo]. See also the press release of the Sousa Rodriguez ruling: Court of Justice of the European Union, Press Release No 111/11, Judgment in Case C-83/10, Luxembourg, 13 October 2011.

[203] Court of Justice of the European Union, Press Release No 111/11, Judgment in Case C-83/10, Luxembourg, 13 October 2011

[204] Article 4 of Regulation 261/2004

One case involving Ryanair[205] resulted of the volcanic ash cloud and snow incidents in 2010/11, which led to thousands of flights being cancelled and passengers stranded at various airports across Europe. As a result of the above, Ryanair added a €2 'compensation surcharge' from April 2011 to fund the cost of compensating passengers under the legislation, saying it would stay in place permanently until such time as the legislation is changed[206]. Ryanair was one of the carriers requesting a hearing at the ECJ asking the Court to clarify 'extraordinary circumstances' (Article 4) and found that 'force majeure' events such as the volcanic ash cloud and extreme winter weather should relieve an airline from its compensation commitments under Article 7, especially where it is beyond the carrier's control[207]. However, the obligation to provide care and assistance applies even in cases of extraordinary circumstances such as the closure of the airspace following a volcanic ash cloud, while such circumstances exempt carriers from their obligation to pay compensation only[208].

10.3.5 Long Delays (Punctuality)

Section 10.2 of this Chapter dealt primarily with the punctuality data available to consumers to inform them of general levels of punctuality by airline and by airport, to assist them with their travel decisions.

This section relates to a separate aspect of punctuality – passengers' entitlement to compensation if their flight has a significant delay.

Under Regulation 261/2004, passengers are entitled to care by the air carrier (phone call, refreshments, meal, accommodation, transportation to the place of accommodation) if they experience significant delays. For delays of more than five hours they are also entitled to choose between reimbursement of the cost of their ticket or being transported to their point of origin.

In April 2011 the Commission published a Staff Working Paper[209] on the incidence of long delays over the period 2006 to 2009. The findings showed that over the period 2006-2009 passengers were entitled to:

- care on less than 1% of all flights;
- reimbursement on at least 0.5% of long haul flights compared to less than 0.1% of short haul flights and 0.35% of medium haul flights; and
- compensation on potentially 1.5% of long haul flights compared to less than 0.4% of short haul and less than 1% for medium haul flights.

There are concerns that these results may be overestimates due to the inclusion of data reflecting 'extraordinary circumstances' and other cases under which carriers do not have to pay compensation.

[205] C-12/11 *McDonagh*.

[206] Ryanair adds €2 levy to cover EU rules on compensation, The Guardian, 30 March 2011 [http://www.guardian.co.uk/business/2011/mar/30/ryanair-levy-compensation-eu261]

[207] Ryanair Challenges Discriminatory EU261 Regulations in EU Courts in Strasbourg, aviator.aero, 9 February 2012 [http://www.aviator.aero/newswire/index.php/2012/02/ryanair-challenges-discriminatory-eu261-regulations-in-eu-courts-in-strasbourg/]

[208] ECJ advocate general calls for defining 'passenger compensation' more broadly, ATW Online, 29 June 2011 [http://atwonline.com/international-aviation-regulation/news/ecj-advocate-general-calls-defining-passenger-compensation-mo]

[209] Commission Staff Working Paper accompanying document to the Communication on the Operation and the Results of Regulation (EC) 261/2004, SEC(2011) 428 final, 11 April 2011

Lufthansa, TUI Travel, British Airways, easyJet and IATA have been contesting through the courts in Germany and the UK the obligation to compensate passengers whose flights are delayed. However in October 2012, the ECJ maintained its interpretation[210] according to which passengers whose flights have been subject to long delay (more than three hours) are entitled to compensation for the delay and in line with EC Regulation 261/2004, unless extraordinary circumstances, outside of the carrier's control, caused the delay of the flight[211]. Using "the principle of equal treatment", the ECJ stated that passengers whose flights are delayed are being in comparable situations to those whose flights are cancelled suffer similar inconvenience, namely, a loss of time, and should therefore have equal right to compensation[212]. Following the judgement, the CAA then updated its Passenger Portal with a dedicated section on this matter to ensure that passengers have access to clear; unbiased information about their rights if they experience a flight delay of three hours or more after the original scheduled arrival time, whilst advising them what they should do if they have a complaint. The aim of the Portal is to provide passengers with "information for your journey including advice for travel related problems"[213].

10.3.6 Lost, Damaged & Mishandled Luggage

If passenger baggage is lost, damaged or delayed, passengers may be entitled to compensation under the terms of the Montreal convention but this is limited to about €1,300. For damaged or lost baggage, the airline is not liable if the damage or loss is caused by an inherent quality or defect of the baggage. For delayed baggage, the airline shall not be liable when it has taken all reasonable measures to avoid the damage resulting from the delay of the baggage or when it was impossible to take such measures. In case of hand luggage, including personal items, the airline is only liable if the damage has resulted from its fault. In 2011 and 2012, there was no further legislative developments to rules on lost, mishandled and damaged baggage but the Commission's proposal of 13 March 2013 includes measures to improve the enforcement of baggage rules and simplifying the complaint-handling process for passengers.

10.3.7 Identity of the Airline

One of the protected passenger rights is the need to be informed, in advance, of the identity of the airline expected to operate any particular flight. This may be important when compensation is needed or complaints may need to be made. It may also impact upon a passenger's choice of carrier. The need for this will rise as incidences of code-sharing and sub-chartering continue to increase.

The European Commission continues to vet individual airlines and nations over the security of their aircraft and their operating procedures. From November 2011, the EU bans almost all carriers from a total of 24 countries including seventeen African nations, five Asian nations and two in Latin America. This figure dropped in 2012 to carriers banned from 23 countries[214].

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[210] Joined cases C-402/07 and C-432/07 *Surgeon and Others*, 2009 I-10923.

[211] CAA Advice To Passengers Hit By Long Delays, Civil Aviation Authority, 23 October 2012, [http://www.caa.co.uk/application.aspx?catid=14&pagetype=65&appid=7&mode=detail&nid=2185]

[212] European Court of Justice upholds ruling on delayed passenger compensation, ATW Online, 24 October 2012, [http://atwonline.com/aeropolitics/european-court-justice-upholds-ruling-delayed-passenger-compensation]

[213] Information for your journey including advice for travel related problems, Civil Aviation Authority, Accessed on 30/4/2013 [http://www.caa.co.uk/homepage.aspx?catid=1759]

[214] List of all Airlines Banned within the EU.pdf [04.12.2012]

Airlines found to be unsafe are banned or restricted within the European Union, although this protection does not extend to European citizens if they elect to fly on any of these airlines on flights not involving a European destination.

The U.S. has a similar list of banned carriers and nations, with an emphasis on airlines operating in Central America and the Caribbean. Although such airlines tend to operate small aircraft which are not capable of flying directly to Europe, it could prove valuable for European consumers to be given this list of additional carriers to inform their choices when flying between points in the western hemisphere.

10.3.8 Protection against Airline Insolvency (& Package Holidays)

Until recently passengers who purchase tickets directly from an airline or its agents were not subject to the same level of protection against insolvency and are thus responsible for ensuring that their private insurance arrangements cover this risk, with some protection available from the Scheduled Airline Failure Insurance (SAFI) fund and with EU governments providing a variety of safety nets to protect such passengers when their tour operator or airline fails.

On the other hand, tour organisers and retailers of package holidays are obliged to provide precise, complete information about booked package holidays under the Package Travel Directive. They are also obliged to honour contractual terms and to protect passengers in the event of insolvency, provide accurate information on the holiday booked whilst complying with contractual obligations and protecting passengers in the case of the organiser's (or an airline's) insolvency[215].

Whilst in other European countries since 2010 extensions were legislated to existing directives to offer passengers the option of such protection, it wasn't until June 2011 when the UK Government initiated a consultation[216] to align the existing directive with new trade practices and provide clarity when customers book what appears to be a package holiday. This resulted in a planned reform of the ATOL scheme in early 2012, making the scheme now the most extensive when compared against most EU comparators, the majority of which rely on bonds or insurance rather than a dedicated fund[217].

The ATOL renewal failure rate reached a record low in 2011 due to the strong working relationships the UK Civil Aviation Authority has established with the travel industry[218]. Although no such statistics are available for 2012, the average number of weeks taken to reach decisions on new and existing applications for ATOLs increased in 2012 as a result of a need to obtain more information from existing businesses than usual in that year and due to preparation for ATOL reform[219].

In early 2012 the Transport Committee was appointed by the House of Commons to assess the Government's proposal on UK ATOL reforms[220], with the results of this study published in the first quarter of 2012. The study reviewed both the short-term proposals such as the introduction of the "Flight Plus"

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[215] Package Travel Directive and regulations, ABTA, accessed 30/04/2013 [http://www.abta.com/news-and-views/policy-zone/more/package-travel-directive-and-regulations]

[216] ATOL Reform Home Page, accessed February 2012 [http://www.caa.co.uk/default.aspx?catid=2094&pagetype=90]

[217] Air Travel Organisers' Licensing (ATOL) reform - Transport Committee Contents, 30 April 2012, [http://www.publications.parliament.uk/pa/cm201012/cmselect/cmtran/1798/179804.htm]

[218] ATOL renewal failure rate hits record low, Travelmole, 4 April 2011 [http://www.travelmole.com/news_feature.php?id=1147077]

[219] CAA Annual Report & Accounts 2012 [http://www.caa.co.uk/docs/2474/CAA_AR2012.pdf]

[220] House of Commons Transport Committee: Air Travel Organisers' Licensing (ATOL) reform [http://www.publications.parliament.uk/pa/cm201012/cmselect/cmtran/1798/1798.pdf]

scheme for bookings made through travel agents that is covered by the ATOL scheme, along with the requirement for travel agents to issue customers with an ATOL certificate and the review of long-term government proposals, such as the intention of the Government to extend the ATOL scheme to holidays and packages sold by airlines and agents for the consumer, by means of provisions in the Civil Aviation Bill, which is currently awaiting Report Stage in the Commons. Under this proposal it is clarified that the ATOL will not be extended to protect flight-only sales by airlines due to the existing EU insolvency protection law.

Consequently, the UK CAA issued the 'Guide to ATOL Reform'[221] and the 'ATOL Reform – FAQs'[222] documents aiming to help members of the travel industry understand the changes to the ATOL Regulation implemented from April 2012. The key objectives under these documents are to improve consumer clarity about which holidays are protected by the ATOL scheme and which are not, and to restore the scheme's finances whilst eliminating the deficit in the ATTF. As per the ATOL FAQs document, 'Flight-Plus' is used in the ATOL Regulations 2012 to describe the type of holiday sale where a consumer requests to book a flight with accommodation and/or car hire at the same time or within a day, but where the way in which it is sold means that it is not a package holiday. Travel agents now need an ATOL to sell this type of holiday while the consumer will benefit from UK ATOL protection. Although this scheme is expected to increase the volume of additional holidaymakers, the lack of argument support from consumer behaviour and views hinders the significance of the assumption due to weak evidence.

The Transport Committee supports the reform and welcomes "the greater coverage and clarity that these changes are expected to bring" and the additional protection this will offer to consumers. However, the Committee raises a series of concerns in a number of areas such as the exclusion of consumer behaviour and views, the clarity between the issues of consumer protection and the repatriation of holidaymakers stranded abroad, and clarity on the modification terms and extension of the existing UK ATOL scheme.

In early April 2012 the new ATOL regulations were laid before Parliament aiming to come into force on the 30 April 2012[223], however minor regulatory errors were discovered and corrected which although they do not affect the main aspects of the ATOL reforms, they do need to be corrected to ensure the ATOL Regulations 2012 can be interpreted properly as soon as they come into force. The appropriate changes were made through the Civil Aviation (Air Travel Organisers' Licensing) (Amendment) Regulations 2012[224], which were laid before Parliament and came into effect on in time before they come into force.

Improvements in the rule relating to airline insolvency were also covered under the 'Air Passenger Rights Revision – FAQs' Memo, with clarifications on the new EC proposals on passenger rights defined under Regulation 261/2004. The new rule suggests that national authorities ensure the appropriate monitoring of the financial position of carriers and where necessary suspend airline operations to minimise the impact to passengers. Proposals are also expressed for EU air transport associations to provide effective and formal promotion of existing voluntary agreements on rescue fares. A wider and more systematic availability of relevant insurance products across the EU and of information about credit card refund schemes or similar

[221] CAA: IMPROVING HOLIDAY PROTECTION- YOUR GUIDE TO HOW ATOL IS CHANGING [http://www.caa.co.uk/docs/2094/Guide%20To%20How%20ATOL%20Is%20Changing.pdf]

[222] ATOL Reform Frequently Asked Questions [http://www.caa.co.uk/docs/2094/ATOL%20Reform%20FAQ's.pdf]

[223] DfT Guidance: Civil Aviation (Air Travel Organisers' Licensing) Regulations 2012 [https://www.gov.uk/government/publications/civil-aviation-air-travel-organisers-licensing-regulations-2012]

[224] The Civil Aviation (Air Travel Organisers' Licensing) (Amendment) Regulations 2012 [http://www.legislation.gov.uk/uksi/2012/1134/pdfs/uksi_20121134_en.pdf]

products is also suggested for passenger protection against the risk of insolvency under national law. Finally, it is proposed that the Commission closely monitors the application of these measures and reviews their performance and effectiveness two years after the adoption of this text.

10.3.9 Misleading Advertising & Price Transparency

Under EU legislation, when a passenger purchases a ticket for flights departing from EU airports, the applicable conditions should be made clear at the time of purchase. Provisions on airline pricing in Regulation 1008/2008 and Directive 2005/29, the 'Unfair Commercial Practices Directive', have already been used to tackle misleading advertising and unfair practices on airline ticket selling. The provisions on pricing in Regulation 1008/2008 should ensure the final price to be paid when purchasing through an airline or travel website will include the applicable fare as well as all applicable taxes and charges, surcharges and fees which are unavoidable and foreseeable at the time of publication (Article 23), as well as displaying these fare components individually as part of the final price.

As stated under the 'Air Passenger Rights Revision – FAQs' Memo[225] published by the Commission, price transparency is not directly covered by the proposals but it is an essential element in consumer protection by EU rules. The liberalised European aviation market provides freedom to companies to freely set up their prices, which allows competition and thus contributes to the abundance of available air services at affordable prices. However, the latter is subject to price transparency rules. Daily enforcement action is already taken at Member State level, whilst the EC is assessing a set of co-ordination actions through stronger cooperation in the field of enforcement in order to better challenge the operators lagging behind, whilst ensuring that these operators meet price transparency requirements for the benefit of passengers.

A recent market development is the introduction of airline ancillary revenues which represent an increasing proportion of overall airline revenues, bringing added complexity to the selling proposition by airlines and travel websites.

GDS provider Amadeus teamed with consultants IdeaWorks in 2010, 2011[226] and 2012[227] to produce an analysis of worldwide ancillary revenues, where revenues disclosed by 47 airlines were applied to a larger list of more than 200 airlines to provide a more global annual projection.

The studies have identified natural airline categories based on their ability to generate ancillary revenue:

- **Ancillary Revenue Champs –** These carriers generate the highest activity as a percentage of operating revenue. The average achieved by this group in 2012 was 19.7%, marginally down from 19.8% in 2011, but up vs. 2010 (19.4%). Examples include AirAsia, Allegiant Air, easyJet, & Spirit Airlines
- **Major US Airlines –** US-based majors generate strong ancillary revenue through a combination of frequent flier revenue and baggage fees. The average for this group was 10.1%, reflecting a drop from

[225] Air Passenger Rights Revision - Frequently Asked Questions Air passenger rights – summary [http://europa.eu/rapid/press-release_MEMO-13-203_en.htm#footnote-1]

[226] Airline ancillary revenue soars to $32.5 billion worldwide in 2011, Amadeus Press Release, 19 October 2011 [http://www.amadeus.com/amadeus/x213158.html]

[227] Airline ancillary revenue projected to reach $36.1 billion worldwide in 2012, Amadeus Business Release, 29 October 2012 [http://www.amadeus.com/amadeus/x225417.html]

the 2011 rate of 11.9%, but still a sizeable increase above the 2010 rate of 7.2%. Examples include Alaska, American and United.

- **Low Cost Carriers –** LCCs throughout the world typically rely upon a mix of à la carte fees to generate good levels of ancillary revenue. The percentage of revenue achieved by this group was 7.2% and is above the percentage revenues recorded for both 2012 and 2011, 6.5% and 5.4%, respectively. Examples include Jazeera Airways, Jetblue, Pegasus, Southwest and GOL.
- **Traditional Airlines –** This category represents a catch-all for the largest number of carriers. Ancillary revenue activity may consist of fees associated with excess or heavy bags, advance seat arrangement and limited partner activity for a frequent flier program. The average here remained at 2.9% for the third consecutive year. Examples include Air Canada, Air New Zealand, Copa, Etihad, Finnair and South African Airways.

Table 10-5 below shows total airline ancillary revenue estimates by airline category for 2012 and 2011. Revenues grew to €28.1 billion in 2012, reflecting a 17% increase on 2011 and a 60% improvement vs. 2010. In the face of difficult worldwide trading conditions that impact on airline profits, such as rising jet fuel costs, contributions from ancillary revenue have provided a boost to the industry by providing an effective hedge against fuel costs. Revenue growth continuation in 2012 "demonstrates the significant commercial potential of airlines", as stated by the VP of Distribution in Amadeus.

Table 10-5: Worldwide Estimate of Ancillary Revenue by Carrier Grouping

Airline Category	2011 Ancillary Revenue (billion) EUR (USD)	2012 Ancillary Revenue (billion) EUR (USD)	% change 12/11 (based on USD)
Major U.S. Airlines	€9.0 ($12.5)	€9.9 ($12.8)	17.0%
Low Cost Carriers	€3.5 ($4.8)	€9.6 ($12.4)	-0.8%
Traditional Airlines	€7.8 ($10.9)	€4.2 ($5.4)	12.8%
Ancillary Revenue 'Champions'	€3.1 ($4.3)	€4.3 ($5.6)	30.5%
Worldwide Totals	**€23.4 ($32.5)**	**€28.1 ($36.1)**	**11.1%**

Source: Amadeus/IdeaWorks October 2012 (2011 & 2012 USD/EUR average annual historical exchange rate, oanda.com)

There is an increasing interest in ancillary revenues from full service carriers which are starting to implement ancillary services through global distribution systems. The major U.S. airlines have a large share of this revenue; their USD $12.4 billion result in 2012 (34% of the global total) represents only six airlines: Alaska Airlines, American, Delta, Hawaiian, United[228] and US Airways. The report demonstrates for the second year that half of the ancillary revenues for US carriers is generated by the sale of frequent flier miles, remarkably linked to co-branded credit cards and closely followed by other on-board services (25%) and baggage fees (20%).

Table 10-6 below shows this revenue grouped by world region. Carriers in North America began to focus on this type of revenue after the oil price shock of 2008 and continue to lead the world in ancillary revenue production representing just over 43% of worldwide revenue. The volume of revenue for North America declined by 5.7% in 2012 primarily because Delta redefined how it discloses ancillary revenue, now excluding revenue from some aviation-related businesses. Another reason behind this drop is the result of the increase in fee waivers for travellers with elite frequent flier status and passengers checking fewer

[228] The merger between United and Continental Airlines completed in October 2011, and the Continental name was dropped in 2012

bags. Despite the overall revenue drop, North America continues to lead on the regions ranking largely due to its large market size and how thoroughly airlines have embraced ancillary revenue methods.

Table 10-6: Worldwide Estimate of Ancillary Revenue by Region

World Region	2011 Ancillary Revenue (billion) EUR (USD)	% of Ancillary Revenue by Region	2012 Ancillary Revenue (billion) EUR (USD)	% of Ancillary Revenue by Region	% change 12/11 (based on USD)
North America	€10.8 ($15.0)	45.8%	€12.1 ($15.6)	43.2%	4.6%
Africa/Middle East	€1.0 ($1.4)	4.3%	€1.3 ($1.7)	4.8%	24.5%
Latin America/Caribbean	€0.6 ($0.8)	2.6%	€0.8 ($1.1)	3.0%	30.2%
Asia/Pacific	€4.5 ($6.3)	19.2%	€5.9 ($7.6)	21.1%	21.3%
Europe	€6.5 ($9.0)	27.7%	€7.8 ($10.1)	27.9%	11.7%

Source: Amadeus/IdeaWorks October 2012 (2011 & 2012 USD/EUR average annual historical exchange rate, oanda.com)

The study also revealed that part of the increased passenger revenue can be attributed to LCCs' increasing levels in ancillary revenues through more product offering and better marketing.

The European Commission has committed to dialogue with the air travel industry in order to monitor compliance with EU law and to collaborate with enforcers to develop instruments to ensure compliance in the long term with an added value for consumers. Many of the current and planned ancillary charges will be optional charges that will have to be clearly identified and are on an 'opt in' basis; however airline, tour operator and travel websites do their utmost to sell them.

These ancillary services vary widely by airline, both in the scope of services offered and the price charged to passengers. Generally these types of services can be grouped into two main headings:

- The air fare (headline price) – including government departure taxes, passenger service charges, fuel surcharges, check-in fees and fees relating to insurance and security costs
- Optional extras & other charges – checked baggage, allocated seating, priority boarding, etc.

Table 10-7 provides a list of current examples of ancillary charges on airline and travel websites:

Table 10-7: Airline & Travel Site Ancillary Charges

Pre-Travel Ancillaries	At Airport & Pre-Flight Ancillaries	On-Board Ancillaries
Insurance	Checked baggage	Seat assignment
Credit card/debit card surcharges	Excess baggage	Premium seats (e.g. extra legroom, exit rows)
Currency conversion charges	Check-in charges (online & airport)	Food & beverage pre-order
Call centre premiums	Priority boarding & screening	Wi-Fi
Sale of approved baggage	Lounge access	On-board sales
Hotel & Car Hire	Change fees	In-flight entertainment
	Exit row seat assignments	

Source: Mott MacDonald

In the UK, the Civil Aviation Authority (CAA) regularly monitors both additional taxes and surcharges which apply to the 'headline fare'; and those which are optional extras and/or other charges chosen by the passenger when making a booking. It looks at the top 24 airlines (based on the number of scheduled flights) operating in the UK, which covers 84% of the passengers travelling to and from the country[229].

The CAA comparison shows that in addition to the charges which are compulsory and included in the headline fare (taxes, security, insurance etc), there remains a wide variation between carriers depending on what form of payment has been used, namely:

- Credit card
- Debit card
- Other method (airline branded payment cards or 'cash passports', PayPal, voucher, bank transfer, Western Union or telephone booking)

Fees for optional extras during the booking process also vary widely between carriers with the CAA monitoring charges for a number of areas such as check-in, priority boarding, hold & sports baggage and meals & refreshments.

Issues relating to price transparency and the potential harmonisation of booking and check-in practices across the EU are part of the new proposals published in 2012, as listed in Section 10.3.1.

In addition to legislation specifically developed for aviation, in October 2011 the EU adopted new consumer rules[230] which limit credit card surcharges on 'distance' (online and telephone) purchases. The package of rules, called the EU Consumer Rights Directive, prohibits online traders from charging consumers more for paying by credit card (or other means of payment) than what it actually costs the trader to offer such means of payment. The Directive merges four existing consumer directives into one set of rules[231]:

- Sale of consumer goods & guarantees (99/44/EC)
- Unfair contract terms (93/13/EC)
- Distance selling (97/7/EC)
- Doorstep selling (85/577/EC)

The surcharges airlines currently impose for making bookings with credit and debit cards vary widely, ranging from airlines such as SAS who make no charges for paying by any method[232], to others – for instance easyjet and Spirit Airlines – who impose a 2.5% surcharge per transaction if paying by credit cards ranging up to £7 per ticket per passenger to £62, depending on whether passengers choose to pay during booking, or at the airport [233].

[229] Comparing airline fees for optional extras and other charges, UK CAA, 31 January2013 [http://www.caa.co.uk/docs/2200/Comparing_airline_charges.pdf]

[230] DIRECTIVE 2011/83/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on consumer rights, amending Council Directive 93/13/EEC and Directive 1999/44/EC of the European Parliament and of the Council and repealing Council Directive 85/577/EEC and Directive 97/7/EC of the European Parliament and of the Council, 25 October 2011

[231] http://ec.europa.eu/consumers/rights/dir_replacing_en.htm

[232] Comparing airline fees for optional extras and other charges, UK CAA, 31 January2013 [http://www.caa.co.uk/docs/2200/Comparing_airline_charges.pdf]

[233] Airline 'extras' continue to soar, Telegraph01 November 2012, [http://www.telegraph.co.uk/travel/travelnews/9648350/Airline-extras-continue-to-soar.html]

In July 2012, the Office of Fair Trading (OFT) undertook an enforcement action on a number of airlines, including Ryanair, Lufthansa and Thomas Cook, to change their pricing policy, by including debit card surcharges in the headline price[234]. This is aimed at protecting people who buy flights online by ensuring air fare pricing is transparent, making passengers aware of the true cost of their flight, by enforcing carriers to incorporate card charges into their pricing. Following the EC price transparency proposals, American Airlines rebranded their fares options while revamping their flight search and web-booking tools[235], whilst the UK Government announced plans to bring forward legislation to ban excessive debit and credit card surcharges across the economy. It has been estimated that the current debit and credit card surcharging costs consumers £300 million on average per annum[236].

10.3.10 Other Consumer Issues under Consideration in the U.S.

Wide-Ranging Updates to U.S. Passenger Protection Legislation in 2012

In the U.S. during 2010, demands for 'transparent' pricing and full travel cost disclosure amongst other consumer protection issues were considered both in U.S. DOT rule-making drafts and legislation, being pushed by a consortium led by Democrat Senator Robert Menendez. Although this regulatory movement ran into stiff opposition from Airlines for America (A4A, formerly known as the Air Transport Association of America), the body representing U.S. air carriers, a new rule was introduced in early 2012 requiring airlines to roll mandatory per-passenger taxes and fees into the advertised fare, while allowing them to break down the costs elsewhere in the advertisement[237].

A Notice of Proposed RuleMaking (NPRM) on requirements pertaining to baggage fees, post purchase price increases, flight status changes and holding a reservation without payment for 24 hours was introduced in June 2010 and eventually passed into law in April 2011. The effective date was 23 August 2011, whilst on 24 January 2012 further requirements pertaining to full fare advertising became effective[238]. For a complete overview of the final rule passenger protections and the effective updates please refer to the 2011 report.

Consequently, late in December 2012, American Airlines made extensive changes to its online flight search and booking tools[239], now branded as Choice, Choice Essential, Choice Plus, Fully Flexible and Business/First branded fares, aiming to achieve fare transparency across all potential flight options at the beginning of the search process.

Frontier Airlines received a $50,000 fine for violating rules protecting air passenger with disabilities, and more specifically for failing to provide a passenger with adequate assistance in pre-boarding and getting on

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[234] OFT forces airlines to stop hiding debit card charges, Travel Mole, 05 July 2012 [http://www.travelmole.com/news_feature.php?news_id=2002143&c=setreg&region=2]

[235] American Airlines shoots for price transparency with new fare displays on its website, skift.com, 12 December 2012 [http://skift.com/2012/12/12/american-airlines-shoots-for-price-transparency-with-new-fare-displays-on-its-website/]

[236] Airlines to scrap debit card surcharges following OFT enforcement action, Office of Fair Trading, 05 July 2012 [http://www.oft.gov.uk/news-and-updates/press/2012/58-12]

[237] Bill would upend new airline fare advertising rule, CNN.com, 31 January 2012 [http://edition.cnn.com/2012/01/30/politics/airfare-fees/index.html?hpt=tr_c2]

[238] Answers to Frequently Asked Questions Concerning the Enforcement of the Second Final Rule on Enhancing Airline Passenger Protections, U.S. Department of Transportation, 11 January 2012 [http://airconsumer.dot.gov/rules/EAPP_2_FAQ_01-11-2012final.pdf]

[239] See footnote 235

and off the plane, despite receiving multiple advance notices that the individual had a disability and needed assistance prior to his flight.

Pricing Transparency & Booking Practices

The final rule made it an unfair or deceptive practice for an air carrier or ticket agent to sell a ticket for air transportation without displaying all tax and fee information in reasonable proximity to the price listed for the ticket; and provide information on taxes and fees – including the amounts and a description of each before requiring the purchaser to provide any personal information.

For further details in the disclosure of optional charges in relation to the final DOT rule, please refer to the previous Annual EU Analyses[240].

In 2012, and since implementing the new legislation, the US DOT levied $3.6m in penalties for violations of the protection of air passengers[241]. This reflects an 11% increase vs. the previous year although the volume of enforcement orders has remained relatively flat. Compared to 2010, the volume of fines in 2012 is three times higher with the volume of enforcement orders reflecting a 75% increase. The total number of enforcement orders and total fines levied hit record highs in the years following the new legislation rules on practices such as compensation due to lengthy tarmac delays, the display of delay information on carrier websites and the full and clear disclose of airfare fees in online transactions. This reflects “the high priority the U.S. Department of Transportation places on protecting air travellers.” The largest number of fines violated US Code – Section 41712, which prohibits carriers and ticket agents from engaging in an “unfair or deceptive practice or an unfair method of competition in air transportation or the sale of air transportation”. This includes the failure to notify a consumer of the expiration date of a ticket bought online, the name of the carrier operating a flight; or failure to display either of these facts on the first web page following an itinerary inquiry. The second and third most common violations related to airlines’ failure to code, record, and respond to disability-related complaints, and foreign carriers’ carriage of local traffic for compensation or hire between two points in the U.S., also known as sabotage.

An example of the enforcement order applied by the DOT occurred in late June 2012 when a $130,000 civil penalty was imposed to Mexico-based airline Volaris after the airline failed to inform consumers that they may have to pay extra baggage fees when purchasing tickets[242]. Reinforcing the argument made by the U.S. Transportation Secretary that “… we will continue to make sure airlines treat their customers with the respect they deserve”, British Airways was also issued a $250,000 fine for violating its full-fare advertising rules as well the Montreal Convention regulating rules for reimbursements of mishandled baggage[243]. AirTran was fined $60,000 by the U.S. Department of Transportation[244] for violating federal aviation laws and rules prohibiting deceptive price advertising in a further attempt to enforce airline compliance to the disclosure of all fees associated with the price of a ticket upfront.

[240] Annual Analyses of the EU Air Transport Market 2011, Final Report for the European Commission, Mott MacDonald, January 2012

[241] Activist DOT collects $3.6 million for airlines’ consumer-protection violations in 2012 [http://skift.com/2013/01/15/activist-dot-collects-3-6-million-for-airlines-consumer-protection-violations-in-2012/]

[242] DOT Hits Volaris with Fine for Not Disclosing Bag Fees, Aviation Today, 22 June 2012 [http://www.aviationtoday.com/the-checklist/76582.html]

[243] DOT Fines British Airways $250,000, Aviation Today, 01 October 2012 [http://www.aviationtoday.com/the-checklist/77366.html]

[244] Authorities cracking down on hidden airline fees? [http://www.travelmole.com/news_feature.php?news_id=1150969]

On violations relating to passenger rights for PRMs, the Ukrainian airline AeroSvit Airlines paid a civil penalty of $20,000 in 2012 for failing to file annual reports detailing disability-related complaints that it received from passengers in 2008 and 2011.

In August 2012, the US DOT published the ‘Air Travel Consumer Report’ (presented at the sixth Worldwide Air Transport Conference in March 2013) which illustrated that passenger complaints relating to price transparency accounted for approximately 12% of all complaints. These related primarily to 1) incorrect or incomplete information about fares, discount fare conditions and availability, overcharges, fare increases and level of fares in general; and 2) advertisement that is unfair, misleading or offensive to consumers. The paper also gives evidence of other regions having engaged in developments to protecting air transport customers relating to price transparency. Brazil for instance has enacted a Regulation which obliges carriers to include all indispensable air service items in the airfare, with items charges separate from the air journey such as refreshments being charged separately.

The working paper concludes by suggesting that “it may be beneficial for ICAO to develop common guidance on the content and format of the information to be provided to the consumer regarding the air ticket price.” For consistency purposes, common definitions of different price components should be developed in the context of the core principles discussed in ATConf/6-WP/5. The Secretariat also proposes that additional research and analysis could be undertaken by ICAO on the distinctive characteristics and needs of the passenger and cargo services in terms of price transparency. The paper consistency of the above with ICAO policies on taxes and charges contained in Doc 8632 and Doc 9082, which make a clear distinction between user charges and taxes.

The paper then closes by suggesting the following recommendations for ICAO on price transparency:

- ICAO to cooperate with all air transport stakeholders with a view to collecting relevant information and designing analytical tools aimed at better understanding the structure of air ticket prices;
- ICAO to develop specific guidance on price transparency as part of the core principles on consumer protection (ATConf/6-WP/5), to ensure price information consistency and compatibility between States,
- ICAO to undertake research and analyses on the distinctive characteristics and needs of the passenger and cargo services in terms of price transparency;
- ICAO to continue to play a primary role in developing policy guidance on emerging issues concerning price transparency, whilst considering the interests of all stakeholders

Continuing on the principle of on-going revision and/or development of rules, the Government of Philippines published in October 2012 the ‘Air Passenger Bill of Rights’[245] document aiming to safeguard passenger rights from certain carrier practises. This document was defined in collaboration with the Department of Transport and Communications (DOTC) and the Department of Trade & Industry, as a response to the increasing number of complaints against airlines, but primarily developed as a measure to protect consumers from certain airline practises such as flight cancellations & delays, overbooking, lost/mishandled luggage and misleading ads. The Bill took effect from December 2012 and is very similar to the rule defined by the EC. For instance in the case of overbooking, the carrier should look for volunteers willing to give up their sheets in exchange for compensation, passengers should be offered a list of amenities to choose from such as priority booking in the next flight, accommodation and/or cash incentive.

[245] ABS-CBNnews: Air passenger bill of rights to take effect Dec 21 [http://www.abs-cbnnews.com/business/12/10/12/air-passenger-bill-rights-take-effect-christmas]

In July 2012, the US Appeals Court approved the new set of price transparency rules on airfares[246], by turning aside a challenge brought to court by Allegiant Travel Co, Southwest Airlines Co and Spirit Airlines Inc, and supported by the industry's trade association. All companies complied with the rules even prior to the court decision.

Punctuality & Long Delays

In the United States, airlines were previously not required by law to compensate passengers whose flights are delayed or cancelled but the final rule now requires airlines to improve their handling of passengers kept on board aircraft on the tarmac.

The two main issues in the rule effective from August 2011 were the adoption of tarmac delay contingency plans and customer service plans addressing carriers' responsibility to passengers, which must be incorporated into the contracts of carriage to generate greater awareness amongst passengers of their rights.

Under the rule, the tarmac delay contingency plans cover operations at each large U.S. hub airport, medium hub airport, small hub airport and non-hub U.S. airport. Further, the rule requires that both U.S. and foreign air carriers update passengers every 30 minutes during a tarmac delay regarding the status of their flight and the reasons for the tarmac delay.

In September 2012 Pakistan International Airlines was the first international carrier fined (USD $150,000) in US for lengthy tarmac delay equal to 4 hours and 47 minutes[247].

The DOT closed 2012 with penalties exceeding USD $200,000 against two airlines for violating federal rules on tarmac delays[248]. Copa Airlines of Panama was fined $150,000 for leaving passengers aboard an aircraft at New York's JFK airport for five hours and 34 minutes in June. Virgin America was fined twice in 2012, total of $155,000, in violations. Qantas paid in total $144,000, for failing to notify passengers in an aircraft at Chicago's O'Hare airport that was delayed for two hours and 16 minutes that they could leave the aircraft prior to its eventual departure to San Francisco.

According to the US Bureau of Transportation Statistics, in 2012 the total volume of flights registering a tarmac delay of more than 3 hours was reduced to 41, the lowest ever recorded value since 1995. This reflects an 18% reduction vs. the previous year and a 67% reduction against 2010.

However, critics of the rule claim that airlines are now pre-cancelling certain flights to avoid risking the hefty fines of up to USD $27,500 per delayed passenger[249] that as found in previous studies will heighten during periods of extreme weather when flights are at greater risk of being delayed on the ground[250].

[246] REUTERS: UPDATE 2-Ads for plane tickets must show real cost-U.S. court [http://in.reuters.com/article/2012/07/24/airline-ticket-ruling-idINL2E8IO66920120724]

[247] DOT issues first tarmac delay fine for international flight, ATW Online, 24 September 2012 [http://atwonline.com/aeropolitics/dot-issues-first-tarmac-delay-fine-international-flight]

[248] DOT Issues Two Fines Against Passenger Carriers for Tarmac Delay Violations [http://www.dot.gov/briefing-room/dot-issues-two-fines-against-passenger-carriers-tarmac-delay-violations]

[249] Airlines: Halt fines for furlough-fueled tarmac delays, USA Today, 23 April 2012 [http://www.usatoday.com/story/travel/flights/2013/04/23/tarmac-delays/2106387/]

[250] New study: Tarmac rule fuels flight cancellations, Orlando Sentinel, 29 March 2011 [http://articles.orlandosentinel.com/2011-03-29/business/os-airline-cancelations-tarmac-rule-20110329_1_tarmac-rule-airlines-that-strand-passengers-marks-aviation]

In the EU, although Regulation 261/2004 provides consumer protection in the event of long delays including on-board delays, it does not specifically address the on board duty of care of an airline to its passengers in the situation where passengers are held on board an aircraft for a lengthy period, thus making no distinction between a long delay in an airport terminal vs. on board an aircraft. The Commission's proposal of 13 March 2013 spells out explicitly how the Regulation is to be applied during tarmac delays.

Glossary

AACO	Arab Air Carriers Organisation
AAGR	Average Annual Growth Rate
AAPA	Association of Asia Pacific Airlines
ACARE	Advisory Council for Aeronautics Research in Europe
ACAS	AirCraft Analytical System
ACCC	Australian Competition and Consumer Commission
ACI	Airports Council International
ACL	Airport Coordination Limited
AdP	Aéroports de Paris
ADS-B	Automatic Dependent Surveillance-Broadcast
AEA	Association of European Airlines
AED	UAE Dirham
AEG-SEC	APEC Aviation Security Sub Group
AFRAA	African Airlines Association
AFTK	Available Freight Tonne Kilometres
AIA	Aerospace Industries Association of America
AIAC	Aerospace Industries Association of Canada
AIRE	Atlantic Interoperability Initiative to Reduce Emissions
AIS	Aeronautical Information Service
ALTA	Latin American and Caribbean Air Transport Association
AMC	Acceptable Means of Compliance
AME	Aircraft Maintenance Engineer
ANS	Air Navigation Service
ANSP	Air Navigation Service Provider
APAM-AVSEC	Asia Pacific Ministerial Conference on Aviation Security
AP-ASAP	Asia-Pacific Aviation Security Action Plan
APD	Air Passenger Duty
APEC	Asia Pacific Economic Cooperation
APR	Air Passenger Rights
ASD	AeroSpace and Defence Industries Association of Europe
ASEAN	Association of Southeast Asian Nations
ASK	Available Seat Kilometre
ASPIRE	Asia Pacific Initiative to Reduce Emissions
ASR	Air Services Regulation
ASSA-I	Aviation Security Services Association – International
ATA	Air Transport Association of America
ATAG	Air Transport Action Group

ATC	Air Traffic Control
ATCO	Air Traffic Control Officer
ATFCM	Air Traffic Flow & Capacity Management
ATFM	Air Traffic Flow Management
ATI	Air Transport Intelligence
ATM (1)	Air Traffic Management
ATM (2)	Air Transport Movement
ATOL	Air Travel Organiser's Licence (UK)
ATR	Aerei da Trasporto Regionale or Avions de Transport Régional
ATS	Air Traffic Services
AVIC	China Aviation Industry Corporation
BA	British Airways
BAA	BAA Airports Ltd
BALPA	British Air Lines Pilot Association
BHX	Birmingham Airport
BMI	BMI British Midland
BRIC	Brazil, Russia, India & China
CAA	Civil Aviation Authority
CAAS	Civil Aviation Authority of Singapore
CAD	Canadian dollar
CAGR	Compounded Annual Growth Rate
CAN	Guangzhou Baiyun International Airport
CANSO	Civil Air Navigation Services Organisation
CAPA	Centre for Asia Pacific Aviation
CAT	Commercial Air Transport
CCD	Continuous Climb Departure
CDA	Continuous Descent Approach
CDG	Paris Charles de Gaulle Airport
CDM	Collaborative Decision Making
CEO	Chief Executive Officer
CFMU	EUROCONTROL Central Flow Management Unit
CFRP	Carbon Fibre Reinforced Plastic
CGK	Jakarta Soekarno-Hatta International Airport
CHF	Swiss franc
CLT	Charlotte Douglas International Airport
CNS	Communications, Navigation & Surveillance
CNY	Chinese yuan

CODA	EUROCONTROL Central Office for Delay Analysis
COMAC	Commercial Aircraft Corporation of China Ltd
CPA	Capacity Purchase Agreement
CRCO	EUROCONTROL Central Route Charges Office
CSU	Chargeable Service Units
CTTF	APEC Counter Terrorism Task Force
DBC	Denied Boarding Compensation’
DEN	Denver International Airport
DfT	UK Department for Transport
DGAC	Direction Générale de l’Aviation Civile
DHS	U.S. Department of Homeland Security
DKK	Danish krone
DME	Moscow Domodedovo International Airport
DOT	U.S. Department of Transportation
DSNA	Direction des Services de la Navigation Aérienne (France)
DXB	Dubai International Airport
EACCC	European Aviation Crisis Coordination Cell
EACP	European Aerospace Cluster Partnership
EADS	European Aeronautic Defence and Space Company N.V.
EAS	Essential Air Service
EASA	European Aviation Safety Agency
EBIT	Earnings Before Interest & Taxes
EBITDA	Earnings before interest, tax, depreciation & amortisation
EC	European Commission
ECAA	European Common Aviation Area
ECAC	European Civil Aviation Conference
ECR	European Central Repository for Aviation Occurrences
EDI	Edinburgh Airport
EEA	European Economic Area
EEC	European Economic Community (now the EU)
EGP	Egypt Pound
ELFAA	European Low Fares Airline Association
ENP	European Neighbourhood Policy
EOL	End of Service Life
EPZ	Enhanced Procedure Zone
EQF	European Qualification Framework
ERA	European Regions Airlines Association

ERAA	European Regions Airline Association
ETS	Emission Trading Scheme
EU	European Union
FAA	Federal Aviation Administration
FAB	Functional Airspace Block
FCO	Leonardo da Vinci-Fiumicino Airport
FHS	Flight Hour Services
FIR	Flight Information Region
FMS	Flight Management System
FTK	Freight Tonne Kilometres
FYROM	Former Yugoslav Republic of Macedonia
GAO	U.S. Government Accountability Office
GBP	British Pound Sterling
GDP	Gross Domestic Product
GDS	Global Distribution Systems
GHG	Greenhouse Gas
GIG	Rio de Janeiro-Galeão International Airport
GLA	Glasgow Airport
GM	Guidance Material
GPS	Global Positioning System
GSIC	IATA Global Safety Information Centre
GSIE	Global Safety Information Exchange programme
HKD	Hong Kong dollar
HKG	Hong Kong International Airport
HMV	Heavy Maintenance Visit
IACA	International Association of Charter Airlines
IAG	International Airlines Group
IATA	International Air Transport Association
IAVW	International Airways Volcano Watch
ICAO	International Civil Aviation Organisation
IFE	In-flight Entertainment System
IFR	Instrument Flight Rules
IMF	International Monetary Fund
INECO	Ingeniería y Economía del Transporte
INR	Indian rupee
IOSA	IATA Operational Safety Audit
IPO	Initial Public Offering

IPSOA	IATA Implementation Programme for Safety Operations in Africa
IVATF	International Volcanic Ash Task Force
JAL	Japan Airlines
JAXA	Japan Aerospace Exploration Agency
JCAB	Japan Civil Aviation Bureau
JFK	John F. Kennedy International Airport
JTI	Joint Technology Initiative
KPI	Key Performance Indicator
LAGs	Liquids, aerosols & gels
LAN	Línea Aérea Nacional de Chile (LAN Chile)
LCC	Low Cost Carrier
LCY	London City Airport
LGW	London Gatwick Airport
LHR	London Heathrow Airport
LP	Low pressure
LTN	London Luton Airport
MAD	Madrid Barajas Airport
MAG	Manchester Airports Group
MAN	Manchester Airport
MBM	Market Based Measures
MINT	Minimum CO_2 in the TMA
MLITT	Japanese Ministry of Land, Infrastructure, Transport & Tourism
MLW	Maximum Landing Weight
MM	Mott MacDonald
MRO	Maintenance, Repair & Overhaul
MTOW	Maximum Take-off Weight
MUC	Munich Franz Josef Strauss International Airport
MWO	Meteorological Watch Office
NAS	National Airspace System
NASA	U.S. National Aeronautics and Space Administration
NAT	North Atlantic Track
NATS	NATS Ltd (UK)
NB	Narrowbody Aircraft
NCL	Newcastle International Airport
NEB	National Enforcement Body
NFZ	No Fly Zone
NGSP	Next Generation Screening Process

NPRM	Notice of Proposed Rulemaking
NRT	Tokyo Narita International Airport
NSA	National Supervisory Authority
NTSB	National Transportation Safety Board
NWA	Northwest Airlines
OAG	Official Airline Guide
OECD	Organisation for Economic Co-operation and Development
OEM	Original Equipment Manufacturer
OFT	UK Office of Fair Trading
ORD	Chicago O'Hare International Airport
ORY	Paris Orly Airport
PBN	Performance Based Navigation
PEK	Beijing Capital International Airport
PETN	Pentaerythritol tetranitrate
PRB	SES Performance Review Body
PRC	EUROCONTROL Performance Review Commission
PRM	Person of Reduced Mobility
PRR	EUROCONTROL Performance Review Report
PSO	Public Service Obligation
PVG	Shanghai Pudong International Airport
R&D	Research & Development
RETACDA	Reduction of Emissions in Terminal Areas (TMA) using Continuous Descent Approaches (CDA)
RLA	Repayable Launch Aid
RPK	Revenue Passenger Kilometre
SAFA	EC Safety Assessment of Foreign Aircraft
SAFUG	Sustainable Aviation Fuel Users Group
SARS	Severe Acute Respiratory Syndrome
SDG	Steer Davies Gleave
SES	Single European Sky
SESAR	Single European Sky ATM Research
SFO	San Francisco International Airport
SIB	Safety Information Bulletin
SIN	Singapore Changi International Airport
SITC	Standard Industry Trade Classification
SJAC	The Society of Japanese Aerospace Companies
SME	Small and Medium-Sized Enterprises

STN	Stansted Airport
SWAFEA	Sustainable Way for Alternative Fuel and Energy in Aviation
SWIM	System Wide Information Management
SYD	Sydney Airport
TAM	TAM Linhas Aéreas (TAM Airlines)
TAWS	Terrain Awareness and Warning System
THB	Thai baht
TJFTZ	Tianjin Free Trade Zone
TLZ	Time-Limited Zone
TMA	Terminal Manoeuvring Area
TRY	Turkish Lira
TSA	Transportation Security Administration
TSU	Total Service Unit
U.S.	United States of America
UAC	United Aircraft Corporation
UAE	United Arab Emirates
UK	The United Kingdom
UNFCCC	United Nations Framework Convention on Climate Change
USAP	Universal Security Audit Programme
USD	U.S. Dollars
USOAP	Universal Safety Oversight Audit Programme
UTC	Coordinated Universal Time
VAAC	Volcanic Ash Advisory Centre
VAT	Value Added Tax
WB	Widebody Aircraft
WTO	World Trade Organization
YoY	Year-on-Year
ZAR	South African Rand