

THE AIRBUS WAY:

# Towards Eco-Efficiency and Sustainable Development





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## CEO Statement

Thomas Enders
President and
Chief Executive Officer, Airbus



Since our last report, in 2006, air transportation in general, and Airbus in particular, have passed major milestones on our journey towards eco-efficiency and sustainable development.

The sector realised that its tremendous achievements on noise (-75%) and emissions (-70%) accomplished over the past decades were not properly known and accounted for, nor our measures perceived as being sufficient to offset our robust traffic growth.

Airbus played a leading role in ensuring the sector elaborates and communicates a common position on its environmental impact, on the basis of scientific evidence, and on the economic and social benefits it generates. Through the Air Transport Action Group (ATAG), and with most of the industry stakeholders, key data were gathered and made available to the general public, and the whole industry is now working towards carbon-neutral growth as committed to by the International Air Transport Association (IATA).

I believe that such a cooperative approach is essential to best match one of our most important environmental challenges, the one of climate change. Airbus launched a call for action to the whole industry in June 2007, when we officially received our corporate ISO 14001 certificate, and I was personally pleased and proud to sign the Aviation Industry Commitment to Action on Climate Change in Geneva earlier this year.

But let's be pragmatic: to fly in the right direction, we need to elaborate the best path and have the most efficient vehicles. The A380, which was designed with the environment in mind, made a smooth entry into service in 2007 and proves to be a real game changer by meeting the growth in demand for mobility with fewer flights, better environmental performance and lower operating costs.

In order to formalise this approach of delivering added value with less environmental impact, Airbus decided to follow an eco-efficiency strategy: it is made of concrete performance measures for our operations, a focus on faster development of existing or emerging technologies and "outside-of-the-box" thinking. Our roadmap for alternative fuels, publicly presented when our A380 flew with Gas-to-Liquid fuel in February 2008, and our increased research efforts, for instance on fuel cells and on better management of air traffic, are part of our strategy.

Being eco-efficient is all the more important when our industry faces new difficulties, such as the huge rise in oil prices in early 2008 and the current economic turmoil. Our customers and our other stakeholders alike are demanding that "efficiency" becomes our prime deliverable everywhere. We are ready to face this challenge, and are setting up the appropriate organisation and governance structure to enhance our overall efficiency.

I hope that by reading our report, you will see that our industry is addressing so many issues and has overcome so many difficult challenges in the past, that we can remain confident in the skills and motivation of our teams to find technologies that will provide the solutions for future sustainable growth.

**Thomas Enders** 

# 121 ABOUT Airbus

Airbus is a leading aircraft manufacturer whose customer focus, commercial know-how, technological leadership and manufacturing efficiency have led to its success in the industry.

#### **BUSINESS ACTIVITY**

With a pioneering and innovative spirit, Airbus designs, sells, manufactures, assembles and supports a modern and comprehensive family of aircraft products for customers and operators all over the world. By the end of 2007, Airbus had sold over 8,500 aircraft to more than 280 customers and delivered more than 5,000 aircraft since it first entered the market. Dedicated to helping airlines get the most out of their aircraft and enhancing the profitability of their fleets, Airbus also delivers a wide range of customer services in all areas of support, tailored to the needs of individual operators all over the world.

#### **OUR HISTORY**

Airbus was established in 1970 as a European consortium of French, German, and later, Spanish and UK companies. They joined forces to build the A300 the world's first twin-engine wide body jet, designed to be a "game-changer" with an innovative economic solution for the increasingly dynamic marketplace. By overcoming national borders, sharing development costs, collaborating in the interest of greater market share, and even agreeing on a common set of measurements and language, Airbus changed the face of the business, bringing airlines, passengers and crews the benefits of real competition.

KEY FIGURES		
	2006	2007
ORDERS (A/C)	824	1,458
DELIVERIES (A/C)	434	453
ORDER BACKLOG (A/C)	2,533	3,421
MARKET SHARE (%)	44 %	51 %
TURNOVER (€M)	25,190	25,216
R&D (€M)	2,035	2,175
NUMBER OF EMPLOYEES	57,043	56,127



#### WHERE WE ARE TODAY

Airbus is a single, fully integrated company incorporated under French law as a simplified joint stock company or S.A.S. (Société par Actions Simplifiée). Its sole shareholder is the European Aeronautic Defence and Space Company (EADS).

Airbus' Executive Committee is headed by President and Chief Executive Officer Thomas Enders, appointed by the EADS Board of Directors. With revenues of more than €25 billion in 2007, Airbus consistently captures about half of all commercial airliner orders.

Airbus is keenly tuned to listening to and learning from its customers, suppliers and industry partners around the world. Today, it not only remains committed to continuing this tradition, but also is equally committed to giving something back to the industry and those who have helped it achieve success.

Airbus' commitment to ensuring that air travel continues to be one of the safest and most efficient means of transportation is reflected in the company's approach to becoming an eco-efficient enterprise.

For more information see: www.airbus.com

# 141 ABOUT Airbus



## PRODUCT LINE

#### **EVOLUTION OF THE AIRBUS FAMILY**

Airbus' modern and comprehensive product line includes four families of aircraft, ranging from 100 to 525 seats: the single-aisle A320 Family (A318/A319/A320/A321), the wide-body, long-range A330/A340 and the all-new A350 XWB Family, as well as the ultra long-range, double-decker A380 Family. Airbus' proven expertise in commercial aviation has also expanded into the military transport aircraft sector.

Airbus has continually strived to introduce new technology and broaden its scope and product range. The A380 is capturing the imagination of the world and setting new standards for the aviation industry. As the flagship of the Airbus family, the A380 reinforces the company's reputation for technological leadership. With the demand for air transport expected to triple in the next 20 years, the A380 offers a comfortable, eco-efficient solution for airlines seeking to grow and expand. Available from 2013, the new A350 XWB (Xtra Wide Body) will confront the challenges of high fuel prices, rising passenger expectations and increasing environmental concerns.

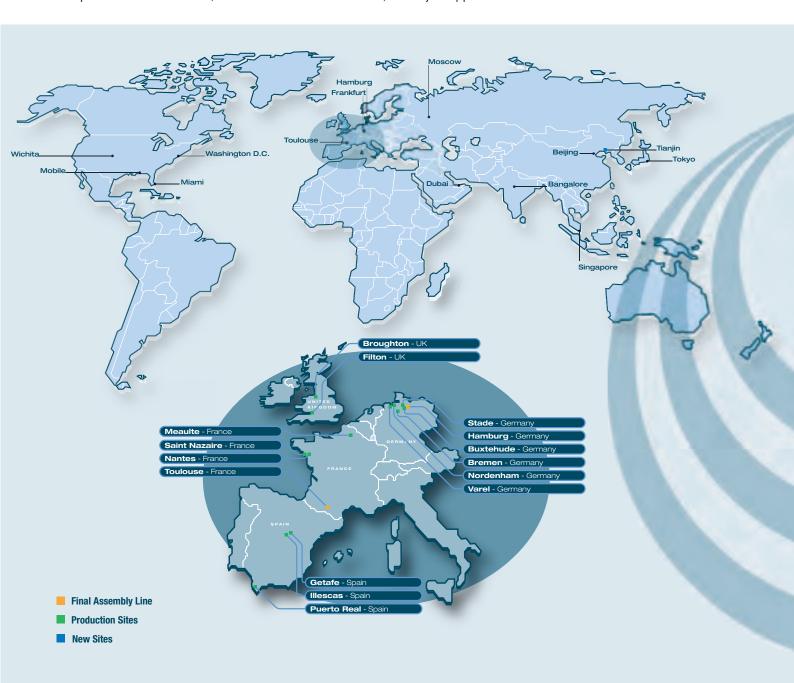


## LOCATION / SITES

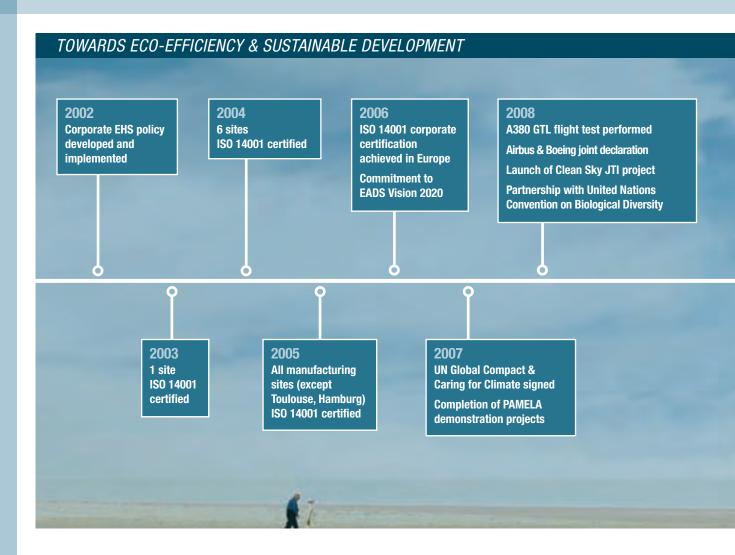
#### PRESENCE AROUND THE GLOBE

Headquartered in Toulouse, France, Airbus is a truly global enterprise. Its more than 56,000 employees draw together the skills and expertise of motivated and experienced teams over the 15 sites in France, Germany, Spain and the UK. Each site produces a complete section of the aircraft, which is then transported to the Airbus final assembly lines in Toulouse, Hamburg and Tianjin. Airbus' industrial network has been expanded to include two engineering centres in North America, a joint venture engineering centre in Russia, an A320 Final Assembly Line in the People's Republic of China, a specialist engineering centre in India and further engineering cooperation in China.

Airbus has offices in the United States, China, Japan, Russia and the Middle East, spare parts centres in Hamburg, Frankfurt, Washington, Beijing and Singapore, training centres in Toulouse, Miami, Hamburg and Beijing and more than 160 field service offices around the world. Airbus also relies on industrial co-operation and partnerships with major companies all over the world, as well as a network of some 1,500 major suppliers in 30 countries.



# VISION & Strategy



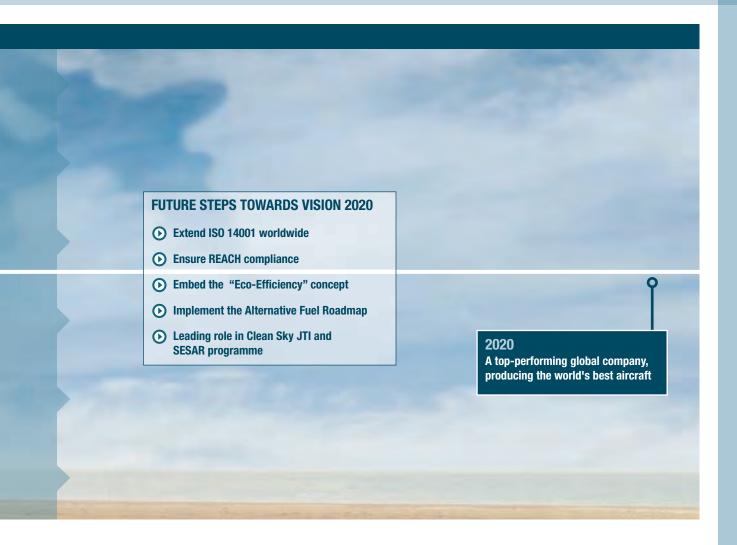
## **OUR VISION**

Air transport plays a key role in economic development and social progress by addressing the growing demand for global mobility. The benefits of air travel are becoming more accessible, more affordable and more important to people from all economic backgrounds and from all parts of the world.

Today's expectations from global society go beyond financial performance of industrial companies. In such a context, the full integration of environmental and social considerations into the sector's business is vital to the sustainable development of the air transport industry. The future of the sector thus depends on the overall industry's effort to grow with less impact on the environment, developing breakthrough technologies and new concepts for air transport.

Since its creation, Airbus has set the standards by regularly introducing innovations and new technology that have contributed to improve the economic efficiency of commercial aircraft and to reduce the environmental impact of their operations. And Airbus is committed to further develop and continuously improve its set of values and principles, throughout its expanding operational perimeter.

Based on the EADS Vision 2020, a changing market landscape and the anticipated growth of the air transport market, Airbus' strategy is to be a top-performing global company, producing the world's best aircraft and ensuring a long-term profitable and sustainable future. Airbus views a responsible management of its activities - reflected in past achievements and future objectives - as an integral part of the company's vision, its management principles and governance.



With the commitment to the recommendations made by the Advisory Council for Aeronautics Research in Europe (ACARE), Airbus has already defined and communicated ambitious goals for its aircraft entering the market from 2020 onwards, with 50% less CO<sub>2</sub>, 80% less NOx and 50% less noise than aircraft designed in 2000.

Moving towards an eco-efficient company and acting consistently to sustain future developments and addressing environmental challenges will thus become a major axis and a clear technological, industrial and managerial choice for the company.

#### **CASE STUDY**



#### AIRBUS & THE WORLD ECONOMIC FORUM (WEF)

Under the auspices of the World Business Council for Sustainable Development (WBCSD) and the WEF, Airbus President and Chief Executive Officer, Tom Enders, took a leading role in the development of climate policy recommendations for the G8 summit that was held in Japan in July 2008.

The recommendations, prepared at the invitation of the G8's Gleneagles Dialogue on Climate Change, Clean Energy and Sustainable Development, outline a new, more "environmentally effective and economically efficient" long-term policy framework to succeed the Kyoto

Agreement. Through this policy, more than 100 CEOs of major companies worldwide urge adoption of a rapid and fundamental strategy by governments to bring about a low-carbon world economy. They call on the G8 and other developed country governments to provide leadership through deep absolute cuts in their greenhouse gas emissions, as well as direct work with the international business community to develop a transparent and pragmatic strategy of cost-effective, medium-term carbon abatement opportunities.

# VISION & Strategy



**Thomas Enders**President and Chief
Executive Officer, Airbus



**Antonio Tajani** Vice President Transport, European Commission

The high fuel prices experienced in early 2008, the need to reduce the sector's greenhouse gas emissions and the recent economic turmoil are serious challenges for air traffic growth. Nevertheless, the forecasts remain robust. Can you explain that?

Tom Enders: Aviation is a must for our modern society. People want and need to fly, and goods makers need air transport to develop and grow the world's economies. That is why the sector is quite resilient to unexpected events that may impact its growth in the short-term. One, however, needs to look at the longer-term horizon and our 20-year forecast thus remains realistically robust. Air transport has always strived to reduce its fuel burn and its associated CO2 emissions and cost, and we can be proud of our performance: over the last 40 years, fuel efficiency has improved by more than 70%, a record unmatched by any other sector.



Air transport has always strived to reduce its fuel burn and associated  $CO_2$  emissions.

Antonio Tajani: I think that we should all stop viewing economic growth and environmental protection as being in opposition to one another, particularly in the current economic context. This is a wrong, old-fashioned way of seeing things. There are obvious synergies to foster that can reduce the environmental impact of increasing human activities. Transport should be a leading sector in setting up these synergies, particularly in Europe, and the European institutions have to lead this process. I am convinced that without a strong transport policy there cannot be a united Europe. And we experience every day how a united Europe is essential to match our challenges. I believe that a more efficient and sustainable transport system will, in the long run, be a more user-friendly and cheaper transport system.

On a more pragmatic front, can you give us some examples of the commitments you have taken to drive the sector towards becoming a more sustainable one?

Antonio Tajani: I want to promote transport which is competitive and of high quality, safe and sustainable, within a comprehensive framework, because transport is a crucial medium for economic and social development, for growth and employment. Toward that purpose, on July 8th this year, I proposed a package of new "Greening Transport" initiatives to steer transport towards sustainability, including a strategy and a methodology for internalising external costs, which will be valid for all modes of transport. In other words, each transport user should pay for the social costs they generate. And the package will ensure that additional revenues are spent on making transport more sustainable, through appropriate investment in research and development and infrastructure.

**Tom Enders:** In fact, Mr. Commissioner, our approach at Airbus is fully contributing to what you just said. Obviously, a fully sustainable transport system means, first and foremost, safety – and you know that air transport, in particular, is a sector for which safety is of utmost importance. Furthermore, we decided to integrate our "eco-efficiency" strategy - creating value with less environmental impact - into the company's top objectives. It has thus been selected as a key element of our 2020 vision and strategy.

To be more pragmatic, I would say that what gets measured, gets done. As a consequence, our strategy is built on a robust environmental management system, based on ISO 14001 international standards, and that covers not only our manufacturing sites, but also our products, throughout their entire life cycle.





#### More precisely?

Tom Enders: Very simple! Environmental considerations are taken into account at each and every phase of the aircraft life cycle, from aircraft design, including our supply chain in the materials and processes selection, through manufacturing, transportation, aircraft operations and maintenance, up to the aircraft's end of life for which we are developing best-inclass techniques. An initial diagnostic has been established, and now, we have set ourselves some ambitious objectives that we monitor and report on regularly. For instance, we have committed to reduce CO2 emissions from our own activities by 50% in 2020, compared to 2006 levels.

You both indicate that research programmes are key to make transport (and air transport in particular) sustainable. Could you tell us more about your common involvement in specific programmes?

Antonio Tajani: There are several projects in which the Commission is a main partner, together with other industries, universities and research centres. For instance, the "Clean Sky" Joint Technology Initiative (JTI) will develop breakthrough technologies to significantly improve the impact of air transport on the environment. It is one of the largest European research projects ever, with a budget of €1.6 billion, equally shared between the European Commission and industry, over the period 2008 - 2013. An integral part of the European Commission's Seventh Research Framework Programme, this public-private partnership will speed up developments and shorten the time to market for new solutions tested on Full Scale Demonstrators. "Clean Sky" will also encourage a deep involvement of SMEs in the programme, therefore offering opportunities to the whole aeronautic supply chain from all EU Member States and associated countries.



# The Clean Sky initiative will develop breakthrough technologies to significantly improve the impact of air transport on the environment.

Tom Enders: Actually, Clean Sky, but also SESAR for the development of a single European sky, will be key elements to achieve the 2020 environmental targets set by the Advisory Council for Aeronautics Research in Europe (ACARE), which are quite ambitious. Airbus will play a leading role in many areas of Clean Sky, particularly on active wing technology, one of the six integrated technology demonstrators, which aims at reducing CO2 emissions and noise.

And we are not alone! More than 54 members of the air transport industry are involved in the Clean Sky JTI. Our current challenges are global, and therefore require multinational collaboration for designing the best innovative solutions, including "outside-of-the-box" thinking. Alternative fuels are the perfect example: some people simply pretend that when there is no more oil, there is no more aviation. Let's be serious. On February 1st 2008, in cooperation with our industry partners, Shell and Rolls Royce, one of our A380s flew with one engine partially running on Gas-To-Liquid (GTL) fuel. This was a major stepping stone in our roadmap for alternative fuels, and results proved the fuel as efficient as traditional kerosene, but with better environmental performance. If the various established partnerships deliver their expected promises, and the certification process is met, up to 25% of sustainable alternative fuels could be in use by aviation by 2025.

#### Will technological improvements be enough to meet the challenge?

Tom Enders: I am absolutely convinced that technology is key – today and in the future. The international air transport association (IATA) has placed it as the first of its four-pillar strategy to achieve carbon-neutral growth, together with more efficient operations, improved infrastructure and the implementation of a fair and equitable set of market-based measures. Once again, international cooperation will make it happen and the air transport industry is committed to work together. In April 2008, I participated at the 3rd Aviation and Environment summit in Geneva and signed the Aviation Industry Commitment to Action on Climate Change, together with other industry stakeholders, partners and competitors.

# VISION & Strategy







I am absolutely convinced that technology is key - today and in the future.

**Antonio Tajani:** Your point is essential and I would like to emphasize how international cooperation can be helpful, giving you two examples:

On June 30th 2008, the European Community and the United States signed an agreement to further strengthen their cooperation on safety. The EU and the US have among the best aviation safety records: less than 0.6 accidents per million of departures between 1996 and 2005. However, both partners want to improve this further by working together. It is important to mention that we expect that the economic returns for manufacturers from the European Community and the US could represent millions of Euros in annual savings thanks to shorter product approval procedures and the mutual acceptance of product tests.

Tom Enders: Another win-win example!!!

Antonio Tajani: Absolutely! And the EC will pursue this approach with other countries.

The second example is the Atlantic Interoperability Initiative to Reduce Emissions (AIRE) that was launched last year in June, at Le Bourget air show, proposed by the European Commission and the US Federal Aviation Administration (FAA). AIRE will explore opportunities focusing on research, development, and accelerated implementations of environmentally-friendly air traffic standards and procedures. It will be based on "gate to gate" test campaigns and experiments, which will make it possible to assess the new measures' environmental benefits and their operational and technical feasibility. The initiative fits with the cooperation protocol signed by the Commission and the FAA to coordinate two major programmes on air traffic control infrastructure modernisation, SESAR in Europe and NEXTGEN in the US. Airbus is one of the partners of this initiative.

**Tom Enders:** Yes, we are. And we are also deeply involved in the SESAR Joint Undertaking, through the SESAR Industry Advisory Group. SESAR aims at developing the new generation air traffic management (ATM) system capable of ensuring the safety and fluidity of air transport worldwide over the next 30 years. An efficient ATM in Europe could reduce CO2 emissions of our industry by some 10 per cent.

Antonio Tajani: Essential! SESAR is the technological pillar of the European legislation for a Single European Sky (SES). The SESAR Joint Undertaking manages the 2.1 Billion Euros programme, funded by the European Commission for 700 Million Euros, by Eurocontrol for another 700 Million Euros and the industry for the remaining 700 Million Euros.

With the second package of legislation for a Single European Sky (SES II), adopted by the Commission on June 25th, 2008, environmental issues are now at the core of the SES with prospective emissions reductions of 10 percent per flight. This is calculated to save an overall 16 million tonnes of CO2 per year and a reduction of annual costs by 2.4 billion euros (\$3.8bn).



The package of legislation for a Single European Sky will help us deliver safer and greener flying.

This is a win-win for passengers, for Europe's economy and for the environment. The skies in Europe are currently still fragmented, so flights are on average 49km longer than necessary. Our proposal aims at helping reduce queues to take off and land, and passengers will have more chance of arriving on time. At the same time, the package will help us deliver safer and greener flying, while creating more capacity.





The IATA four-pillar strategy also includes market-based measures. What are your views on this and particularly on the introduction of aviation into the European Emissions Trading Regime?

Tom Enders: First of all: we are an aircraft manufacturer and our responsibility is to sell, build, manufacture and deliver safe, efficient and affordable aircraft. This obviously includes environmental performance and as I mentioned before, technology is key. The A380 is the perfect example of what technology can achieve. With fewer movements, thanks to its increased capacity, the A380 enables the industry to absorb part of the traffic growth while limiting the overall environmental impact at the same time. Indeed, the aircraft has remarkable noise margins of 17 decibels, with regards to current Chapter 4 international standards, and it burns less than three litres of fuel to carry one passenger over 100 km. This represents less than 75g of CO2 per passenger per km. I just recall that the objective for the car industry in 2012 is 120g, but you know this, Mr. Commissioner, better than I do.

Market-based measures may be looked at to deal with the environmental impact that could not be totally offset by the four pillars, including technology. Aviation must be incorporated, just like any industry, in the Kyoto and post-Kyoto process, but policy makers should also take into consideration air transport's specificities, and particularly its global scope, which crosses boundaries. Unilateral, regional ETS are not the right way forward as they result in a competitive disadvantage for airlines serving or operating in these regions. A global challenge requires a global, not a regional, solution and we fully support in that respect the position of ICAO, based on extensive evaluation, that a worldwide open emissions-trading system would be the most cost-effective solution.

Antonio Tajani: The problem lies in the complexity of setting up this system worldwide: it should fully take into account the interests of countries that have not ratified the Kyoto protocol or countries, mainly in developing and emerging countries, for which the Kyoto protocol does not assign any quantitative objective. That is why, based on the experience Europe has gained through the existing ETS put in place since 2005 for fixed installation, the EU institutions are on the verge of finalizing agreements on the sector's inclusion in the EU's emissions trading scheme. I think it is important, for Europe, to demonstrate a leadership position in this fight against climate change. But we shall ensure that our aviation industry has the means to remain highly competitive on the world stage: For instance, limiting the scheme to intra-EU flights only or to EU-based airlines only would certainly introduce a competition distortion that would be detrimental to our airlines. That is why we intend to apply this scheme to any departing or arriving flight in Europe, whatever the nationality of the operator.



Air transport remains key to social, economic and technological development worldwide.

#### In conclusion, what do you see as the future of air transport, in Europe and worldwide?

Antonio Tajani: As I said previously, transport is a crucial medium for economic and social development, for growth and employment. So if we want to foster sustainable development of our society, we must build the most efficient transportation system with the lowest environmental impact. For instance, we must remove the remaining obstacles to the smooth functioning of the internal market in some sectors, and the fragmentation of air traffic control systems is one of them. We must ensure that for each demand for mobility, the best sustainable transport answer can be delivered. We will certainly have to find innovative solutions, to foster inter-modal transportation systems and I am sure that innovation is an area in which Europe can demonstrate its true added value and its leadership in the worldwide sector's evolution.

**Tom Enders:** Well, the current economic situation certainly creates some turbulence for the industry. But our sector has gone through severe turbulences and downturns before. Hence, I am fundamentally optimistic. Air transport remains key to social, economic and technological development worldwide.

# VISION & Strategy

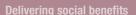
### **INDUSTRY CONTEXT**

### Addressing environmental

Aviation is widely considered to be responsible for 2% of worldwide man made  $\text{CO}_2$  emissions, with the United Nations Intergovernmental Panel on Climate Change (UN IPCC) estimating that this could rise to 3% by 2050. Today, 80% of aviation's greenhouse gas emissions are related to passenger flights exceeding 1,500km/900 miles, for which there is no practical alternative.

challenge is to limit the industry's contribution to man-made  $\text{CO}_2$  emissions to 2-3%, or even reduce it while pursuing continuous efforts to lower air transport local environmental impacts, especially in terms of noise and local air quality.

The increase in fuel prices, in early 2008, and the environmental impact of using fossil fuel has moved the air transport sector to engage in alternative fuels business cases.



With 32 million jobs globally, including 5.5 million direct jobs, air transport is a major global employer. Current and future working conditions of the overall workforce need to be maintained at a high standard. The growth and successful future of the industry requires and relies on the ability to attract and retain talented

Aviation transports over 2.2 billion passengers annually. At the societal level, air transport thus contributes to global mobility, facilitates tourism and improves living standards, fighting poverty and promoting social inclusion by providing access to people in remote areas. It also facilitates the delivery of emergency and humanitarian aid relief.

#### **Driving economic development**

It is estimated that aviation contributes, directly and indirectly, to 7.5% of world **Gross Domestic Product (GDP), generates** 32 million jobs and is responsible for the transport of 35%, by value, of all international trade. Aviation transports 44 million tonnes of freight annually.

Air transport is helping in the transition, both economically and socially, of key emerging markets and economies like China and India.

Air transport is the only transport mode that fully pays for its own infrastructure, through the payment of user charges that represented US\$ 42 billion in 2006.







Page No.

**AIRBUS PRIORITIES** 

Continuously improve its environmental performance through a lifecycle approach with ISO 14001

Design the most fuel-efficient aircraft through the continuous and progressive introduction of advanced materials and new processes to reduce aircraft weigh

Support aircraft operators, airports and authorities in implementing eco-efficien air traffic management procedures

Promote scientific research on alternative fuels for air transport

Reduce noise at source through low-noise nacelle designs, acoustic treatment, optimised propulsion systems and overall aerodynamic efficiency

■ Provide eco-efficient solutions to manage aircraft end-of-life

**■** Reinforce performance management and support managers in leading a high performance culture

■ Recruit more women, more non-Airbus nationals, and more non-European

■ Establish constructive, open, objective, responsive and transparent social dialogue and partnerships

■ Further develop the key competencies of the company through innovative skills management tools

Ensure safe working conditions for the workforce

■ Launch a corporate foundation and enhance Airbus' philanthropic activities

■ Help airlines improve their profitability by providing eco-efficient, comfortable

■ Support emerging countries' access to

their aircraft by providing appropriate customer support services

to ensure top quality and on-time delivery of orders







## **OUR COMMITMENTS**

#### A LONG-STANDING COMMITMENT TO ENVIRONMENT, HEALTH & SAFETY

Environment, health and safety (EHS) considerations have long been an integral part of Airbus' activities at all levels of the company, and are a key priority in the development of all new techniques, products and processes. Our Corporate EHS policy, encompassing existing documents in the historic countries of Airbus, was consolidated and elaborated from 2001 and published in 2002. All Airbus Functions, National Entities and Subsidiaries are responsible for the consistent implementation of this policy. They guarantee the establishment of appropriate implementation directives and the availability of the necessary resources, especially with regards to employees. Periodic assessments are performed on a worldwide basis to monitor the implementation of the EHS policy.

## ISO 14001 & AIRBUS' ENVIRONMENTAL MANAGEMENT SYSTEM: A CONTINUOUS IMPROVEMENT OF ENVIRONMENTAL PERFORMANCE THROUGHOUT THE LIFECYCLE

In December 2006, Airbus received the International Organisation for Standardisation (ISO) 14001 environmental certification that covers the company's 15 European sites, as well as all of its products throughout their whole lifecycle. ISO 14001 is the key tool that enables Airbus to further drive the company towards environmental improvements, reduction of costs and sustainability. Thus, Airbus now uses a systematic approach in the form of a robust Environmental Management System (EMS) to continually monitor the environmental impact of its processes and products at each stage of their activity in the lifecycle. It ensures that the company complies with all applicable environmental legislation and regulations and that it commits to continually improve its environmental performance. ISO 14001 is a dynamic process, as it implies a constant improvement of environmental performance. The company is committed to maintain and improve its EMS and to extend its scope of application. The non-European Airbus sites (Airbus Americas and Airbus in China) will all be certified along the same lines as the European ones, but the key challenge is also to spread the environmental consciousness throughout the whole supply chain.

# VISION & Strategy



#### GLOBAL COMPACT: A NEW STEP TAKEN TOWARDS CORPORATE CITIZENSHIP

In May 2007, Airbus joined the United Nations Global Compact, an international initiative that brings businesses together with UN agencies, civil society, and government to advance ten universal principles in the areas of the environment, human rights, labour and anti-corruption. With more than 4,700 corporate participants and hundreds of other stakeholders from more than 130 countries, the Global Compact is the world's largest voluntary corporate citizenship and sustainability initiative. Joining the Global Compact will help Airbus foster innovative synergies by entering into a collaborative international network of leading manufacturers, including major customer airlines, to help contribute to a sustainable future. Airbus is working toward the implementation of the Global Compact Principles, and our next report will further detail the progress made.

As climate change is a key issue for society, the need for leadership and voluntary action is becoming ever more urgent. To demonstrate its leadership in tackling climate change as a Global Compact member, Airbus signed the voluntary statement "Caring For Climate; the business leaders' platform", a platform of commitments developed by the Global Compact, the United Nations Environmental Program (UNEP) and the World Business Council for Sustainable Development (WBCSD).

#### THE 10 PRINCIPLES OF THE **UNITED NATIONS GLOBAL COMPACT**

#### **Human Rights**

Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights; and

Principle 2: make sure that they are not complicit in human rights abuses.



#### Principle 3: Businesses should uphold the freedom of association

and the effective recognition of the right to collective bargaining; Principle 4: the elimination of all forms of forced and compulsory

Principle 5: the effective abolition of child labour; and

Principle 6: the elimination of discrimination in respect of employment and occupation.

#### **Environment**

Principle 7: Businesses are asked to support a precautionary approach to environmental challenges;

Principle 8: undertake initiatives to promote greater environmental responsibility; and

Principle 9: encourage the development and diffusion of environmentally friendly technologies.

#### **Anti-Corruption**

Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.

#### **ENVIRO-AERO WEBSITE**

In August 2007, Airbus joined a global industry-wide initiative set up by the Air Transport Action Group (ATAG) to communicate what the aviation sector is doing to mitigate or limit its impact on the environment. A dedicated website, www.enviro.aero, is available to give information about aviation and the environment, and to provide consolidated data and examples of good practices. It should also provide actual facts on the sector's environmental performance, thereby helping to build an image that best reflects reality. The objective is to ensure that aviation can grow while preserving the environment, and that people will continue to fly with confidence. For more information see: www.enviro.aero

#### What is "eco-efficiency?"

As defined by the World Business Council for Sustainable Development (WBCSD), "ecoefficiency is achieved by the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life-cycle to a level at least in line with the Earth's estimated carrying capacity." In short, it is concerned with creating more value with less impact. Eco-efficiency is a management philosophy that encourages business to search for environmental improvements that vield parallel economic benefits. It focuses on business opportunities and allows companies to become more environmentally responsible and more profitable.

#### THE AIRBUS BUSINESS CASE FOR ECO-EFFICIENCY

On the journey toward a sustainable industry, Airbus commits to becoming an eco-efficient enterprise, i.e. a more profitable company that minimises its overall impact on the environment. The methodology is based on assessing environmental behaviour, environmental impact, possible impacts on human health and ecosystems, and on the cost of products and processes from the cradle to the grave. The specific customer benefit always lies at the centre of eco-efficiency analysis. The approach will encourage all functions, programmes and contributors across the company to become more competitive and innovative, while at the same time exercising greater responsibility for the environment. A roadmap is currently being developed, and eco-efficiency criteria have been defined. They will be tested on a selected number of cases by the end of 2008 before application throughout the company. Progress on the companywide initiative will be communicated in our next report. Some key examples will be provided every year to the Global Compact in the frame of our "Communication on Progress".

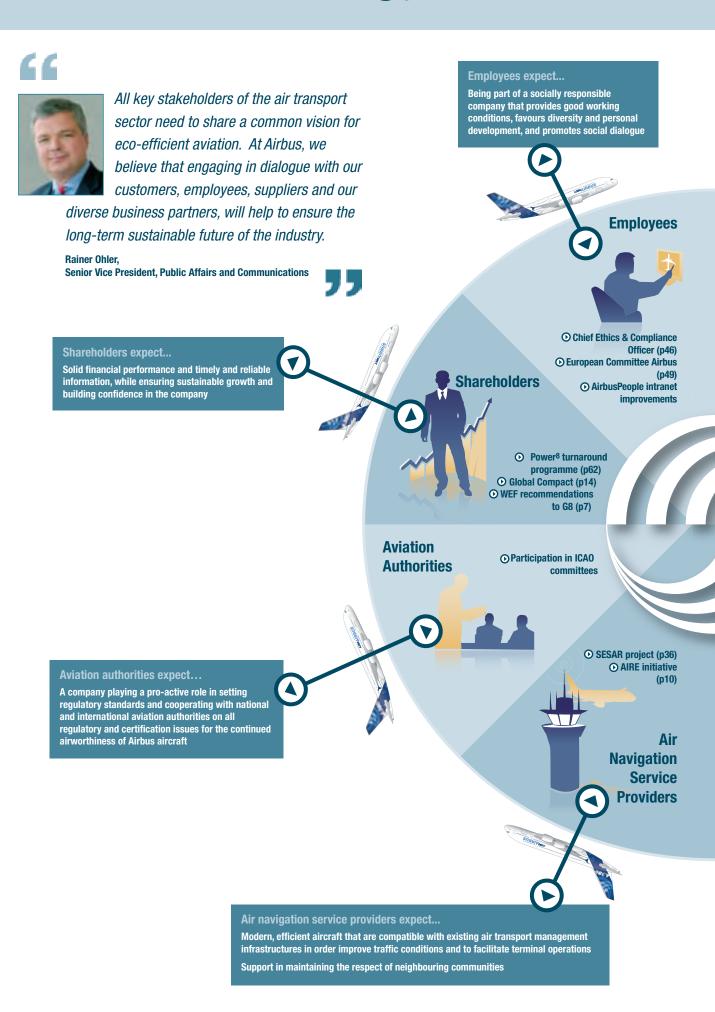
#### AIRBUS AND BOEING JOIN FORCES TO IMPROVE AVIATION'S ENVIRONMENTAL PERFORMANCE

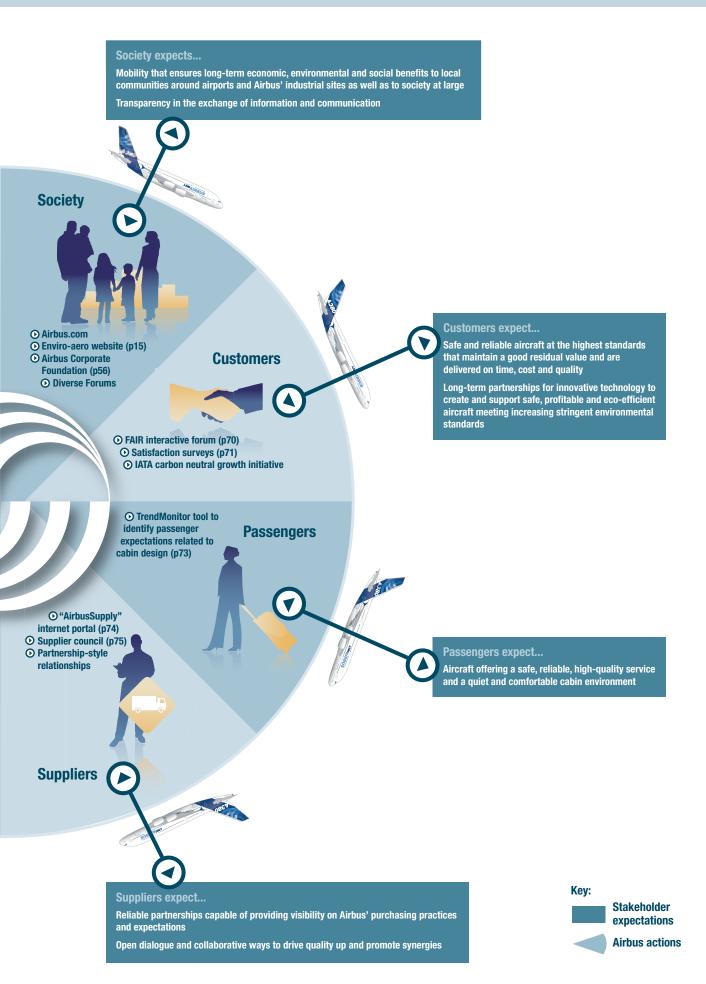
Airbus and Boeing have signed an agreement to work together to ensure global interoperability in Air Traffic Management as part of an effort to help reduce the impact of aviation on the environment. The companies will seek the acceleration of improvements to the world's air transportation management system in order to increase efficiency and eliminate traffic congestion. Tom Enders, Airbus President and CEO, and Scott Carson, Boeing Commercial Airplanes President and CEO, signed the agreement between the two industry leaders at the sidelines of the 3rd Aviation and Environmental Summit in Geneva, Switzerland in April 2008. Improvements to the global air transportation system that provide more efficient routing, better arrival management and speed control will reduce inefficient delays and time in the air, which will save fuel and reduce emissions. The partners believe such Air Traffic Management improvements represent the greatest short-term opportunities to reduce CO<sub>2</sub> emissions.

#### AIRBUS & UNITED NATIONS CONVENTION ON BIOLOGICAL DIVERSITY (CBD)

In 2008, Airbus established a new partnership with the United Nations Convention on Biological Diversity and will be involved in the "Green Wave" initiative, an ambitious education and youth outreach programme designed to raise awareness on bio-diversity and to create international relationships, particularly among young people. The initiative will encourage students to plant trees and to celebrate the International Day for Biodiversity at 10am on 22<sup>nd</sup> May each year. Airbus' initial involvement is to help raise public awareness for the initiative through a joint global communications campaign. Airbus will then work with airlines and other industry members to further develop support for "Green Wave" and the CBD.

# VISION & Strategy





# ACTIVITY Report

# Measuring Our Progress

## **ACHIEVEMENTS AND OBJECTIVES**













Airbus' commitment to environmental responsibility has long been central to its activities and a key driver of the company's products, techniques and processes. Airbus has sharpened and embedded its eco-efficient approach into an Environmental Management System (EMS) designed to align, channel and leverage environmental initiatives across the company.

#### AT A GLANCE

Eco-efficiency at Airbus is demonstrated through the involvement and contribution of all stakeholders, the continuous optimization of its product portfolio and the establishment of advanced formal management systems. We go beyond the mere fulfilment of our legal obligations, we identify and aspire to meet environmental requirements to which our organization voluntarily subscribes and are committed to continuously improving our performance.

#### **KEY 2006-2007 ACHIEVEMENTS**

- ISO 14001 corporate environmental certification covering all European manufacturing sites and products throughout their lifecycle (p22)
- Set up of REACH programme (p23)
- Launch of "Clean Sky" initiative (p26)
- Development of new milling solutions with lower environmental impacts (p28)
- Caring for Climate initiative (p37)
- Signature of agreement to study benefits of synthetic jet fuel (p38)
- 2006 European Decibel d'Or award for noise reduction technology (p40)
- Dismantling of an A300 with >85% of its value retained and >70% reuse + recycling in the framework of the PAMELA project (p42)
- Creation of TARMAC Aerosave company dedicated to managing aircraft end-of-life (p43)

#### **AIRBUS' PRIORITIES:**

- Maintain the ISO 14001 certification and extend to China and the Americas by end of 2008
- Between 2006 2020, reduce energy consumption at manufacturing sites by 30%, CO₂ emissions by 50%, water consumption by 50%, water discharge by 80%, and waste production by 50%
- Invest in research so that new Airbus aircraft types from 2020 onwards will enable the air transport system to meet the ACARE vision





We are committed to act as a responsible industrial player and to improve the environmental performance of our company and our products throughout their lifecycle.

Christian DUMAS, Vice President Sustainable Development & Eco-Efficiency



# AIRBUS' Approach

#### CASE STUDY



#### ACADEMY PROJECT

Best practices in environmental management are demonstrated through Airbus' ACADEMY, a European LIFE Environment project (LIFE04 ENV/FR/000353). ACADEMY, Airbus Corporate Answer to Disseminate Environmental Management System, ran as a three-year project from 2005 to 2007 to develop an innovative Environmental Management System. Airbus and its ACADEMY project partners (GIFAS, CRCI, ATECMA, SBAC, EADS) used a product and site-oriented environmental management system to test a full life cycle approach. This allowed us to define coherent corporate objectives and to organise their monitoring by a series of appropriate and suitably chosen indicators.

#### **About LIFE Environment**



LIFE Environment is the EU's financial instrument supporting environmental and nature conservation projects. LIFE contributes to the implementation, development and enhancement of the Community's environmental policy and legislation and works to integrate environmental concerns into other EU policies. It supports the development of new solutions to environmental problems facing the EU and aims for the full implementation of the Community policy defined by the 6th Environment Action Programme (EAP) that provides a strategic framework for the EU Commission's environmental policy through to 2012.

While many other EU funding programmes have environmental components, LIFE has been the only programme devoted entirely to supporting the development and implementation of environmental policy in the Member States of the European Union, in candidate countries associated with LIFE, and in certain third countries bordering on the Mediterranean and the Baltic Seas.

From 1992 – 2006 LIFE co-financed 2,751 projects, contributing approximately €1.35 billion to the protection of the environment and is now followed up by LIFE+ with further opportunities for funding.

## **POLICY & MANAGEMENT**

## MANAGING ENVIRONMENTAL IMPACTS THROUGHOUT THE AIRCRAFT LIFECYCLE

Since the decision to implement an environmental management system (EMS) in 2004 in order to continually monitor and improve the environmental impact of Airbus' processes and products at each stage of the company's activity, several milestones have been achieved.

After a stepwise certification of its European sites, in late 2006, Airbus received a corporate certification to ISO 14001 environmental standards from independent auditor Bureau Veritas, following a company-wide audit. The ISO 14001 certification recognises that Airbus uses a robust environmental management system to continually monitor and minimise environmental impacts, similar in many ways to the quality management system in place today. But Airbus had set a much more ambitious aim: creating a "Site and Product Orientated Environmental Management System" (SPOEMS). The company has thus been the first in the aerospace industry to include the life cycle of its products in the scope of its ISO 14001 certification.

Airbus uses this innovative approach, supported through the ACADEMY project, to map, assess, prioritise and track all the environmental effects an aircraft and its related production processes have, or may have, at each stage of the aircraft's life cycle in a continuous improvement process. The approach covers aspects of design, procurement, manufacturing, aircraft operations and aircraft end-of-life. This means that from as early as the initial concept phase, Airbus not only deals with short-to medium-term issues concerning design, production, supply and support, but also issues that lie many decades ahead, such as dismantling and recycling. It is thus a comprehensive review of the complete value chain that provides a tool for decision-making.

All Airbus functions, national entities and subsidiaries are responsible for the consistent implementation of the company's EHS policy, the integration of eco-efficiency principles in every business decision and the improvement of the global environmental performance of Airbus and its products throughout the life cycle. Targets have been set to maintain and improve the certified EMS against ISO 14001 standards; furthermore, a network has been implemented throughout the organisation with a responsible manager appointed within each affected function, such as procurement, engineering or customer support.



#### **AIRBUS SPOEMS (Site & Product Oriented Environmental Management System)**

Investing in research to design cleaner aircraft page 24



Inventing new best practices to disassemble and recycle end-of-life aircraft page 42





Managing the **supply chain** for a shared vision of environmental responsibility page 27

optimising
aircraft
operations
and maintenance for enhanced
environmental performance page 36



Mitigating the impact of **manufacturing**on the environment thanks to cleaner technologies and processes page 28



The significant environmental issues identified throughout the aircraft life cycle include the impacts of chemicals and manufacturing processes. Therefore, specific focus is given in the life cycle approach to research programmes that will lead to a reduction of the environmental impact of manufacturing, and similarly, to comply with chemical regulations such as REACH in Europe.

#### CASE STUDY



#### ENGAGING EMPLOYEES, AIRBUS IN THE UK

On "World Environment Day" in 2007, Airbus employees at Filton and Broughton were encouraged to make a personal pledge to reduce their environmental impacts and help tackle climate change. Over 500 pledges were made on that day, and the figure later climbed to more than 600. All of the pledges were forwarded to the UK Environment Agency for compilation to show the difference employees can make.

#### **REACH and Airbus**

The European Union recently introduced a strict and harmonised risk management policy with regards to chemical substances. This newly created system is based on the Regulation (EC) No 1907/2006 which was adopted by the European Parliament and the Council of the European Union on 18 December 2006 and came into force on 1 June 2007. Policy obligations will be gradually introduced up until 2018, with the main obligations taking effect 1 June 2008.

This Regulation oversees the *Registration, Evaluation, Authorisation* and restriction of *CHemicals*, REACH. The main objectives of the REACH regulation are to improve the protection of both human health and the environment from potential hazards of chemicals, while enhancing industrial competitiveness and innovation by promoting Research and Development. REACH requires all chemical substances manufactured, imported and used within the European Union in amounts exceeding one tonne per year to be registered. Substances not registered cannot be manufactured, imported or used on the European Union market.

Airbus has adopted a policy of replacing hazardous materials and processes used for engineering and manufacturing, wherever feasible, and joining in efforts by other industry partners. A REACH Programme, with dedicated resources and budget, was set up and formally validated by the Executive Committee on 21 November 2007.



# DESIGN at Airbus



#### **CASE STUDY**



Airbus is continuously working with its customers and suppliers to reduce the impact of aviation on the environment by means of using advanced materials and new processes. The continuous and progressive introduction of new technology - leading to a reduction in the basic weight of the aircraft, better aerodynamics, improved systems - and the development of advanced engines minimise noise, fuel consumption, and, subsequently, the level of engine emissions.

The **A320** aircraft was a step-change in technology when it was first introduced in 1988. Today, its relative fuel burn per trip is the lowest of any single-aisle aircraft with more than 100 seats. The latest state of the art single-aisle aircraft are 40% more efficient than older ones and save 28 million tonnes of fuel and 88 million tonnes of  $\text{CO}_2$  annually.

The **A380** is the first commercial aircraft to incorporate as much as 25% composites. With a carbon-fibre-reinforced plastic composite centre wing box, weight savings of up to 1.5 tonnes versus the most advanced aluminium alloys have been achieved. The aircraft has a fuel efficiency of 2.9 litres per passenger seat per 100 kilometres; the average world fleet won't get to this level for another 15-20 years.

The **A350 XWB** features new high-lift flaps (patented by Airbus) that are simpler than a conventional flap and require fewer moving parts. In-flight drag can be reduced, resulting in fuel economies and reduced levels of CO<sub>2</sub> emissions.

## **INVESTING IN RESEARCH**

#### ECO-EFFICIENCY AND INNOVATION

Since its creation, Airbus has constantly introduced innovations that have contributed to improvements in the economic efficiency of commercial aircraft and reduced the environmental impact of aircraft operations. Airbus successfully balances innovation with reliability, flexibility and economics without compromising safety requirements. The company builds aircraft that are recognised worldwide for their efficiency, safety and environmentally-friendly operation.

Eco-efficiency – delivering value with less environmental impact - will be key in allowing air transportation to grow in an acceptable way. Innovation, research and technology have always been instrumental in improving the eco-efficiency of aircraft and will be essential enablers to meeting this challenge; wherever it brings benefits to the customer, operator, or on the manufacturing and maintenance side. Opportunities exist across a wide range of technologies, and an integrated approach will yield the greatest results.

Design Technology can enable eco-efficiency benefits in manufacturing, supply chain, aircraft operations and aircraft end of life. Many of the opportunities, however, have a long lead time and are only likely to be applied on products toward the end of the next decade. Airbus continues to increase its investment in Research & Technology (R&T), because it is important to keep setting the standards for the benefit of the industry and society in the decades ahead.

#### DESIGN FOR THE ENVIRONMENT

The design process of most products is key in their environmental life-cycle performance, and the majority of a product's environmental impacts will be determined during this phase. In fact, about 80% of the impacts on the environment that a product will produce over its lifecycle are already defined during its development.

Minimising environmental impacts at source is paramount for Airbus, as design exerts a major influence on each aspect of aircraft environmental performance. Therefore, this is one of the top-level requirements for the design of any new Airbus product. When these decisions concern strategic improvements, such as the reduction of noise levels to comply with specific airport standards, trade-offs are possible with key performance parameters such as fuel burn and operating costs and have to be investigated. Alternative environmentally friendly design solutions are developed and qualified to the same standard to ensure no compromise is made in terms of safety and technical performance.



One major strand of the company's R&T efforts is to investigate, test, validate and optimise the most advanced technologies, design features, configurations and architectures that will lead to aircraft generating less noise and fewer emissions, while carrying the maximum payload over the optimum range. Airbus is committed to reinvesting all the savings generated through the manufacturing phases of its Environmental Management System into eco-efficient R&T programmes.

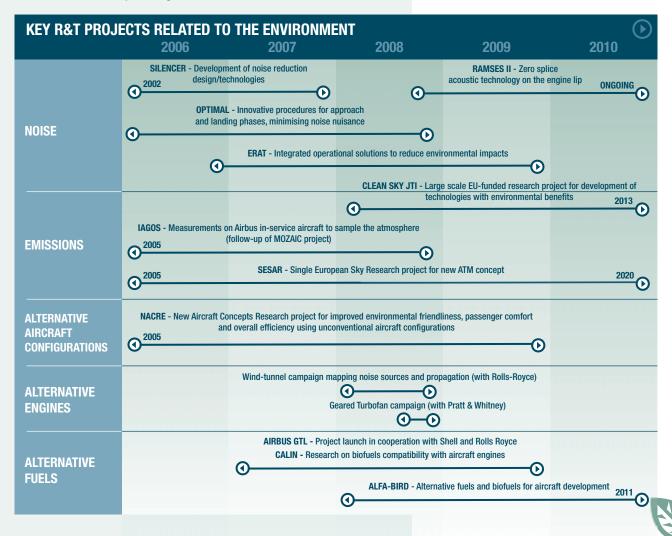
#### COMMITMENT TO ACARE GOALS

Modern aircraft are typically 70% more fuel-efficient than 40 years ago, correlating directly with an equivalent CO₂ reduction. They are about 20 decibels quieter than 30 years ago, thus leading to 75% less noise annoyance. In its Vision 2020, the Advisory Council for Aeronautics Research in Europe (ACARE) describes a significantly improved air transport system. Challenging goals have been set and translated into strategic research. Airbus invests up to €500 million per year so that all new Airbus aircraft types entering the market from 2020 onwards will be designed to produce 50% less CO₂, 80% less NOx and 50% less noise in their 2020 operating conditions than comparable aircraft designed in 2000 in their 2000 operating conditions.



#### **KEY FIGURES INNOVATION & DESIGN**

- More than 1,200 research workers
- Over 400 initiatives in progress
- **○** Virtually all R&T delivers environmental benefits
- **637** patents applications filed by Airbus (2007)







#### **CLEAN SKY PROJECT FOR AVIATION**

The necessary steps towards the 2020 environmental goals set by ACARE will have to be demonstrated and validated through major technology breakthroughs and accelerated research processes.

For the past two years, Airbus has been leading the preparation of a new European research programme, in conjunction with other major European aerospace companies: The "Clean Sky" Joint Technology Initiative (JTI).

#### **FOCUS**

#### **Clean Sky Joint Technology Initiative**

Clean Sky is a co-financed public/private partnership between the European Commission and the aerospace industry. It was launched in February 2008, following the positive vote at the European Parliament and the formal adoption by the Council of Ministers in December 2007. The support of the European governments is crucial in speeding up the overall optimisation of the European aeronautical sector via the European Single Sky initiative and in driving joint technology initiatives. Airbus is one of the leading Clean Sky Partners, together with EADS-CASA, Eurocopter, Rolls-Royce, Safran and the European Commission. The project will bring together more than 100 organisations (Industry, Universities, Small and Medium Enterprises and Research Institutes).

The JTI offers the opportunity to make progress on the introduction of green technology into aviation. The technologies to be developed will not only have to drastically reduce pollution, but will also reinforce the competitiveness of the aeronautics sector in Europe. What makes Clean Sky different from previous European research projects is its size and scale, as well as its special focus on the demonstration of technologies. The initiative will have a €1.6 billion budget over the period 2008-2013. The scope of the JTI is designed to meet the complexity of today's research challenges by drawing on all sources of R&D investment (public and private) at the European level and using a new co-ordinated multi-disciplinary approach.

Clean Sky is composed of 6 Integrated Technology Demonstrators (ITD):

**SMART Fixed Wing Aircraft** will deliver active wing technologies and new aircraft configuration for breakthrough, news products. As the first ITD, the SMART Fixed Wing Aircraft has officially started work with a kick-off meeting in Toulouse in August 2008.

**Green Regional Aircraft** will deliver low-weight aircraft using smart structures, as well as low external noise configurations and the integration of technology developed in other ITDs, such as engines, energy management and new system architectures.

Green Rotorcraft will deliver innovative rotor blades and engine installation for noise reduction, lower airframe drag, integration of diesel engine technology and advanced electrical systems for elimination of noxious hydraulic fluids and fuel consumption reduction.

Sustainable and Green Engines will design and build five engine demonstrators to integrate technologies for low noise and lightweight low pressure systems, high efficiency, low NOx and low weight cores as well as novel configurations such as open rotors and intercoolers.

Systems for Green Operations will focus on all-electrical aircraft equipment and systems architectures, thermal management, capabilities for "green" trajectories and mission and improved ground operations to give any aircraft the capability to fully exploit the benefits of Single European Sky. Eco-Design will focus on green design and production, withdrawal, and recycling of aircraft, through the optimal use of raw materials and energies, thus improving the environmental impact of the whole products life cycle and accelerating compliance with the REACH directive.

Airbus will play a leading role in many areas of Clean Sky, including major participation on active wing technology, which aims to reduce CO<sub>2</sub> emissions and noise.

# ACARE goals Technology Domains Engines ■ New Aircraft Configurations Low Weight Configurations ■ Aircraft Energy Management Mission Management External noise reduction Engines ■ Trajectory Management New Aircraft Configurations ■ Low Noise Configurations Rotorcraft Noise Reduction ■ Rotorcraft Optimised Configuration "Economic" Life Cycle Source: Clean Sky, for more information see: www.cleansky.eu





## **TOWARDS GREENER SUPPLY**

The entire Supply Chain plays a major role in the sector's global eco-efficiency. This is reflected in the importance Airbus places on the need to involve suppliers as contributors to the continuous improvement of such environmental performance. Suppliers are expected to accept the principles of the Airbus environmental policy and to implement procurement specific requirements. Suppliers are also reminded of their responsibility to comply with all laws and regulations applicable to their activities.

#### KEY ENVIRONMENTAL OBJECTIVES

The Procurement department at Airbus is actively involved in the maintenance of the Environment Management System and in promoting supplier environmental management:

- Ensuring compliance with environmental laws and regulations
- Managing and limiting the environmental risks linked to the use of highly hazardous materials
- Putting in place joint actions and industry cooperation with suppliers and other stakeholders
- Promoting the procurement of environmentally friendly products

In order to achieve these objectives, environmental requirements are gradually being implemented into Airbus' contractual arrangements with suppliers through the document "Environmental Requirements for Airbus Suppliers" (AP 1003). This policy stipulates the minimum environmental requirements applicable to all Airbus suppliers. Environmental criteria are also developed and taken into account for the selection and performance assessment of the suppliers.

Airbus works closely with its supply chain and has initiated the establishment of synergies within the aeronautical industry, mainly through the leadership of different working groups at the international level such as the ASD (Aerospace and defense industries association of Europe), or the EAQG and IAQG, the European and International Aerospace Quality Groups.

International cooperation and R&T projects have been set up with main suppliers, for instance on trials of alternative fuel, fuel cell research or trials of more eco-friendly aircraft paints. Airbus has also been cooperating with Rolls-Royce (RR) and other partners, since 2007, to research the potential benefits of synthetic jet fuel processed from gas and has successfully performed an RR engine test on an A380 test flight with a gas-to-liquid fuel blend. In October 2008, Airbus and engine supplier Pratt & Whitney (P&W), launched a flight test campaign on a technology demonstrator version of P&W's new geared turbofan engine. The tests are being performed on an A340 flight test aircraft until the end of 2008.



#### **CASE STUDY**



## SUPPLY CHAIN AWARENESS ACTIVITIES

The organisation of awareness sessions, active participation in conferences and the provision of guidance material have been put in place. These platforms for communication enable Airbus to maintain regular dialogue with its suppliers. The efforts reinforce the company's expectations and help suppliers to implement environmental requirements.

For instance, awareness sessions were organized at Airbus in France in 2006, which some 200 suppliers participated in. Further documentation is available on the Airbus supplier portal AirbusSupply. Airbus also participated in main supplier events in 2008 such as the Airbus Supplier Conference, the Aerotrends or Surf-Air, and the Airbus Material Dialogue event presenting the environmental policy of Airbus.

Because REACH, the European Regulation on chemical substances, has been a major compliance subject since 2006, working groups with supplier associations at the national and international level have been set up and have led, for example, to the publication of the REACH Interpretation Guidelines. These guidelines have been extensively distributed to the company's suppliers in 2007 and 2008.





# MANUFACTURING Impact



#### CASE STUDY



## MECHANICAL MILLING OF FUSELAGE PANELS (LIFE 05 ENV/F/000062)

Airbus, in conjunction with Dufieux Industrie, have developed a new milling machine which produces nose fuselage panels 50% faster and cheaper than traditional methods and lowers environmental impacts. Until now, milling (reducing the thickness of aluminium aircraft panels) has been a labour-intensive process that involves using a chemical bath, producing hazardous byproducts. The new non-chemical process, introduced in 2006, produces only aluminium shavings as a byproduct, all of which are collected, recycled and sold back to the supplier. The partnership received European Union development LIFE funding and now shares joint patents on the technology.

#### **ECO-EFFICIENCY BENEFITS (yearly)**

- Water savings of 225,000 m3 per year equivalent to the consumption of a city of 4,000 inhabitants
- Waste reduction of >16,000 tonnes (hazardous and domestic waste)
- **▶** 50% gain on operating costs
- 20% gain on cost of each manufactured unit
- **▶** 50% gain on production cycle time
- 57% economy on electricity consumption



## SITE PERFORMANCE

## REDUCING THE ENVIRONMENTAL IMPACTS OF MANUFACTURING

At Airbus' plants, the use of materials and chemicals for manufacturing aircraft is being tailored to meet environmental guidelines. Such operating standards lessen any potential effect on the surrounding environment and on health and safety conditions for employees and partners working in the plants. Particular attention is paid at Airbus to customising compliance of operations against local applicable laws and regulations.

Four main areas of Airbus' manufacturing processes, specific to the aeronautical industry, have a potential impact on the environment: metal and composite working, surface finishing and treatments, component and parts assembly and final assembly. Airbus devotes considerable effort to containing, reducing and, where possible, eliminating their environmental impact through the efficient abatement of the inputs to, and outputs from, these processes, as well as the implementation of clean technologies and regular monitoring.

Each manufacturing output has been evaluated in terms of quantity, health considerations and frequency, with the most significant impacts classified into three main categories: air emissions, waste and effluents. In terms of manufacturing inputs, Airbus continuously aims to reduce energy consumption, to conserve non-renewable resources, like fossil fuels, and to protect potentially renewable resources, like water, by recycling it for certain industrial processes.

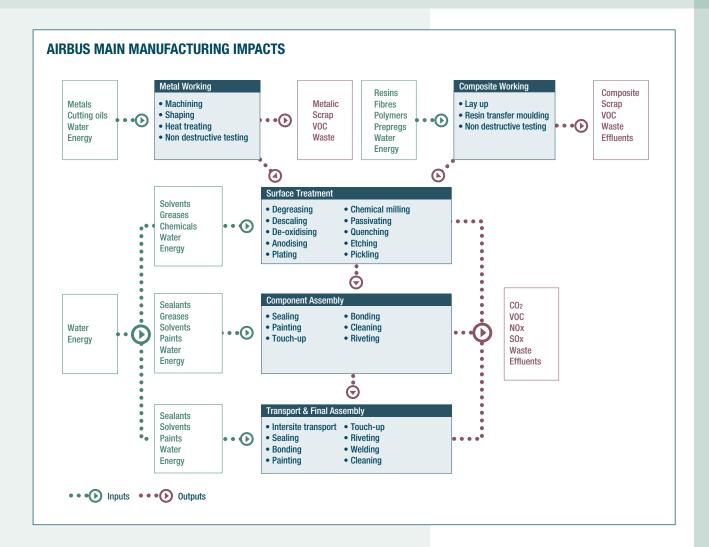
Specific ambitious targets have been set to reduce the environmental impact of Airbus manufacturing activities.

#### The objectives for 2020\* are to reduce:

- Energy consumption by 30%
- CO<sub>2</sub> emissions by 50%
- Water consumption by 50%
- Water discharge by 80%
- Waste production by 50%.

To achieve these targets, new industrial processes are being developed. Such changes are real win-win solutions on both the environmental and economic side. For example, water used in surface treatment can be limited by recycling it, by reducing evaporation thanks to lower bath temperatures and by minimising rinse levels as far as possible. Furthermore, the elimination of chromates (for which Airbus is investing €80 million), when completed in 2010/2011, will not only reduce pollution, but may also generate added value at lower costs.

\*2006 baseline



#### RESPECTING LANDSCAPE AND BIODIVERSITY

Airbus closely follows its activities' impact on the local environment and takes action to ensure its responsible integration into the local landscape and to protect biodiversity around the company sites.

For instance, in order to avoid land contamination and to limit the ground pollution during Airbus' de-icing operations at Toulouse station, a de-icing area has been set up. It is Airbus' responsibility to collect the liquid after the operations.

## MINIMIZING DISTURBANCE LEVELS OF OPERATIONS AROUND SITES

Strict monitoring and control of potential disturbances due to Airbus activities, including flight tests and operations in and around manufacturing sites, is ensured by the company. Airbus is actively involved on a regular basis in dialogue with local residents, the general public and local authorities via several joint consultation bodies.

#### CASE STUDY



#### REDUCING ENGINE RUN-UP NOISE

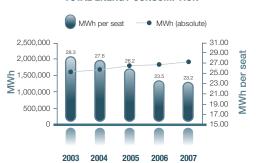
In 2006, a joint new Airbus/Air France Industries engine test site (also known as the engine run-up facility) was opened in Toulouse, France. It is used to validate the performance of aircraft engines once they have been integrated on Airbus aircraft. Acoustic analysis was conducted at the site in order to look at how noise escapes from the facility and could affect the surrounding neighbourhood. Microphones were placed in the vicinity to measure both the noise levels and the spread of noise. Engine run-ups were undertaken in all weather conditions - as cloudy conditions could affect the way sound is dispersed. Specially-designed deflector panels placed on the interior walls of the site inhibit the spread of noise from its lowest to highest frequencies.





# MANUFACTURING Impact

#### **TOTAL ENERGY CONSUMPTION**



## **ENERGY & EMISSIONS**

Airbus energy use mainly results from heating and lighting requirements (offices, administration buildings, production facilities etc.), as well as from industrial processes. Airbus recognises that it has a responsibility to reduce energy usage where possible, both from an economic and an environmental impact perspective. The company sees this as an opportunity to make continuous improvements in this area, particularly within the environmental management system that has been set up to monitor these impacts.



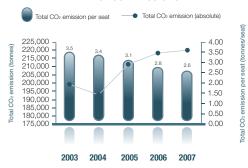
#### **AIRBUS IN CHINA**

In the 2007 Awards for Excellence, Airbus in China had three entries nominated. Of these, the 'Energy saving' initiative of the building energy team was a winner in the Efficiency category. In a project which began in 2003, the building energy team has sought to save energy and find more eco-efficient solutions to heating and cooling. This has resulted in innovative solutions such as using outside air to supply cooling systems, which have reduced electricity use by 50%. Savings of €220,000 have been made since the start of the project in electricity consumption.

#### CASE STUDY



#### DIRECT CO2 EMISSIONS\*



\*CO<sub>2</sub> Emissions from fossil fuel combustion

#### **PROGRESS FROM 2003 - 2007**

- Total absolute energy savings of 1,001,665 MWh between 2003 and 2007, equal to the yearly consumption of a French town with 20,000 inhabitants
- Direct CO<sub>2</sub> emissions (tonnes/seat) reduced, on average, by about 7% per year since 2003
- Absolute VOC reduction by more than 50% between 2006 and 2007
- NOx reduced (in absolute terms) by 34% since 2003
- S0x reduced by 26% (tonnes/seat) between 2006 and 2007

#### ENERGY CONSUMPTION AND CO2 EMISSIONS

In the past few years, the number of Airbus sites and associated workforce have expanded in response to growing market demand for new aircraft, with total absolute energy consumption, therefore, increasing by 4% between 2006 and 2007. However, when assessed against levels of production, total energy consumption actually dropped by 2%, which was mainly due to widespread energy-saving measures across the sites, including technological improvements in the production process, together with associated employee training programmes. In addition, Airbus reduced direct carbon dioxide emissions from fossil fuel consumption per seat by 4% between 2006 and 2007. Some of this was the result of paying careful attention to environmental issues in the design and construction of new buildings and the increased use of alternative energies, as well as good communication across and throughout Airbus sites.



#### **VOLATILE ORGANIC COMPOUNDS (VOC)**

VOC emissions may contribute to the formation of summer smog. They mainly come from solvents and potentially harm ground and water. In aircraft manufacturing, VOC emissions are emitted in coating operations and surface treatments They are heavily regulated at European and national levels. VOC emissions from all sources are closely monitored and a series of reduction measures have been introduced.

#### These measures include:

- Replacement of high VOC-containing chlorinated solvents by aqueous cleaners
- Automation of painting operations, reducing paint waste and fugitive emissions
- Replacement of all liquid solvent in use on the shop floor with pre-impregnated solvent wipes to better control solvent consumption

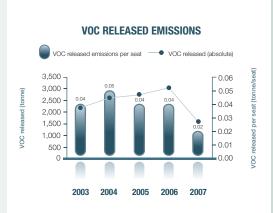
For example, Airbus in Germany has invested heavily in analysing VOC-reduced water-based paint and in supporting local paint producers to design and manufacture water-based products suitable for covering all the metal components of an Airbus aircraft. Especially strict legal requirements exist in Germany including a limit of 250g/ltr VOC. Since the beginning of 2007, a new paint type has been used that not only fulfils, but also even exceeds the legal requirements. The new paint can be processed in ways very similar to conventional paints, but contains only about ¼ of the solvents. Quality is maintained because the new product is as robust as the old paint. These new types of paint have been qualified and are now used in production. About 2/3 of an aircraft (particularly primer/top coat) can now be painted in an environmentally friendly and solvent-reduced process.

Overall, Airbus achieved a 54% reduction of VOC emissions between 2006 and 2007.

#### NOx AND SOx EMISSIONS

Energy saving techniques and combined heat and power systems in its combustion plants have enabled Airbus to reduce the level of NOx and SOx emissions:

Between 2006 and 2007, Airbus achieved a reduction of NOx emissions per seat of 13% and of 26% of SOx emissions per seat.

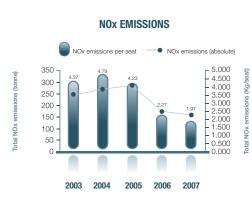


#### **CASE STUDY**



#### REDUCTION OF VOC IN FRANCE

Airbus in Nantes has put in place a reduction plan for VOC emissions through its Investments and Methods department, in cooperation with an engineering university in Nantes. They have developed a completely new masking cabin which uses a concept based on absorption and reduction of solvents by the cabin. The solvent reduction is realised by thermic oxidation, resulting in only 10mg of solvent discharge per cubic metre into the air.







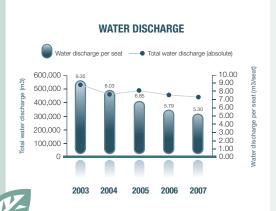
# MANUFACTURING Impact

# WATER CONSUMPTION Water consumption per seat Total water consumption (absolute) (2,500,000 (2,500,000 (33.00 (31.07 (33.00 (31.00 (27.00 (27.00 (28.00 (27.00 (28

# CASE STUDY rip rip rip rip AIRBUS

## WATER RESOURCE MANAGEMENT AT MÉAULTE SITE

The Méaulte production site of Airbus in France has reached the targeted objective of zero industrial water discharge and 30% water consumption reduction compared to 2005. To obtain these results, a first step took place in 2000 with the installation of a decontamination station for surface treatment, followed by the actions in the framework of the ISO 14001 certification that led to this performance.



## **WATER & WASTE**

Airbus is committed to preserving water resources and tackling the significant environmental issues associated with the generation of waste. The company thus carefully controls the use of all water supplies on its sites, and has introduced various measures to improve industrial waste management and to optimise waste recycling.

#### **PROGRESS FROM 2003 - 2007**

- Savings of 1,394,990m3 in water consumption between 2003-2007, corresponding to the yearly consumption of a 25,000 inhabitant town in Europe
- Savings of 844,200 m3 in water discharge between 2003-2007, the yearly production of a 15,000 inhabitant town in France
- **⑤** €3.6m saved thanks to a decrease in hazardous waste production in the period between 2003-2007

#### WATER RESOURCE MANAGEMENT

Airbus has intensified measures to reduce water consumption in the areas of production where it is used the most. For activities such as surface treatments, cleaning during assembly and non-destructive testing for both metals and composites, water-saving processes have been improved and water is now frequently recycled.

As a result of regular and effective monitoring, Airbus water consumption has been closely controlled over the years. The company has made significant investments in the surface treatment area to optimise the use and recycling of process water on both sites. Water saving processes have improved within surface treatments, non destructive testing for both metal and composites (non metal) and cleaning during assembly.

Such improvements have led to an overall 10% reduction in water consumption and a 9% reduction in water discharge, assessed against the level of production, at all Airbus sites between 2006 and 2007, following efforts to raise employee awareness of the need for water savings.

Over a five-year period (2003-2007) this has meant significant savings of 1,394,990 cubic metres in water consumed and 844,200 cubic metres in water discharged.

#### **WASTE MANAGEMENT**

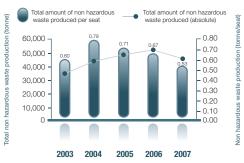
The amount of waste generated at Airbus sites assessed against the level of production decreased by 21% for non-hazardous waste and by 11% for hazardous waste between 2006 and 2007.

During the period between 2003 and 2006, €3.6 million were saved thanks to a decrease in hazardous waste production. The company is working to further reduce waste production at source by training employees, developing new technologies and streamlining processes, to improve the collection, sorting and recycling of waste.

For example, the ISO 14001 audit, passed in November 2006 at Airbus' site in St. Nazaire, documented efficient cooperation and high involvement of all actors, especially on the effective management of waste. One of the main 2006 actions was the installation of a centrifuge at one of the waste facilities to separate the oil from aluminium splits and thus improve their valorisation. In 2006, 80% of all waste at the St. Nazaire site was separated, and good results have been obtained on actions coordinated through the environmental department, local EHS supports and manufacturing units.

In Spain, the inauguration of a collection and recycling centre took place at the Illescas site in 2006. This 740 square meter installation helps keep waste at a minimum. One purpose is to operate as a transit zone between the various onsite locations that generate waste. Within the installation, an area of 208 square metres has been dedicated to the specialised treatment of hazardous materials (which require special care during handling). Another area of 208 square metres is dedicated to non-hazardous and recyclable material.

#### NON HAZARDOUS WASTE PRODUCTION



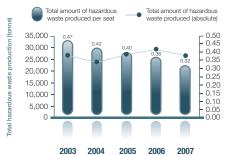
#### **CASE STUDY**



#### **ALUMININIUM SWARF**

About 95% of an aluminium billet is turned into swarf when machining an aircraft rib, resulting in approximately 2,400 tonnes of swarf being produced at the Filton site in an average year. Previously, swarf was recycled into items such as washing machines and cars, but now 90% is being recycled back into aircraft grade aluminium and reused in wing manufacture. After collection, the swarf is compressed into briquettes each weighing 2.5kg. Each skip load takes away nearly nine tonnes of aluminium alloy for recycling.

#### HAZARDOUS WASTE PRODUCTION









# MANUFACTURING Impact



#### **KEY PERFORMANCE INDICATORS** 2007 2006 Number of Beluga flights 2,548 2,471 Number of sections delivered 4.038 3.674 (all programmes) ▶ Est. CO₂ emissions related to air 1.35 1.34 transport (in kgCO<sub>2</sub>/tonne.km) **SURFACE** 2006 2007 Number of sections delivered 70 72 by A380 Surface Transport **Est. CO<sub>2</sub> emissions related to A380 surface** transport (in kgCO<sub>2</sub>/tonne.km) 1.26 River craft (UK) 2.09 River craft (France) 1.00 0.85 1.17 1.01 Sea Road 0.08 0.18

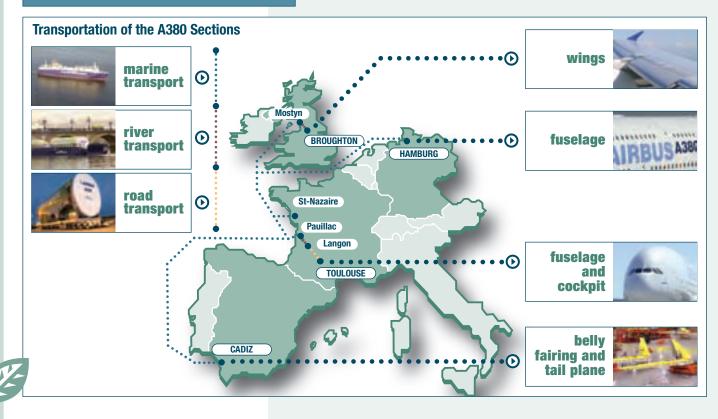
# TRANSPORT SYSTEMS

# INTERSITE TRANSPORT

Airbus has developed an innovative system for inter-site transport of aircraft sections. It was specifically designed to increase efficiency **in the air** as well as **on the ground**, maintain the highest level of service, quality, on time delivery, and safety, while limiting the impact of transport on the environment.

Airbus Transport International, headquartered in Toulouse, France, is a fully-owned subsidiary which operates the five A300-600ST Super Transporters, nicknamed Belugas, used to carry aircraft sections between the different European manufacturing sites. It is licensed for world-wide cargo charter operations and, since its creation in 1996, has successfully transported a wide variety of oversized cargo for third parties.

Large and heavy aircraft sections for all Airbus programmes are transferred from any of Airbus' manufacturing facilities in Europe (adjoining an airport runway) to the final assembly lines in Toulouse and Hamburg, thanks to these Belugas specifically built for this purpose. For the A380, aircraft components are shipped via a multimodal transport network that combines marine, river and road transport, when they are far too large for the Belugas. First the aircraft sections travel by sea to Pauillac (France), where they are transferred to barges up the River Garonne. Once inland, they continue their journey by road convoys, over three nights, to the manufacturing site in Toulouse.



Airbus has developed transport solutions for aircraft production that minimise environmental impacts. The main objectives are to limit the impact of oversize transport activities on the environment and to optimise the transportation system to control fuel consumption and continuously seek opportunities for improvement. For this, environmental key performance indicators have been set up, for example, to quantify CO<sub>2</sub> emissions for each transport method. Furthermore, noise disturbances are identified and transport operators are integrated into our environmental approach. This applies to all Airbus programmes and the whole transport network, including transport between Airbus production sites, from Airbus production sites to its final assembly lines and from suppliers sites to Airbus sites. In addition, environmental considerations are deployed in the design and selection of transport solutions for programmes in development (such as the A350 XWB), attending to emissions and noise impacts in the transportation plan.

The Belugas, for example, generate very low noise levels, with a margin of 14 EPNdB over their relevant certification limit (ICAO Chapter 4). Such low levels of noise disturbance in the immediate vicinity of the airports are a requirement of Airbus' operations. In order to limit noise during the landing phases, the feasibility of limited use of the reverse on the Beluga stations was investigated in 2006 and flight documentation was updated accordingly.

For the multi-modal A380 transportation system, each mode has been evaluated in order to limit is overall impact on the environment. The double-hulled barges are designed to preserve the riversides and fishing, thanks to minimum bow wave and reduced engine noise. Furthermore, the river craft used in the UK have significantly improved their  $\mathrm{CO}_2$  impact by stopping the engines during waiting time and using shore electric connections as an effective means to reduce emissions. The low-speed road convoys use exceptionally large trucks equipped with special noise reduction features and satellite-guided systems for constant speed and no additional nuisance.

Further actions and measures on emissions impacts and transport optimisation are currently under investigation in order to control fuel consumption, to search for improvements and to use the full capacity of each means of transport.

# ECO-EFFICIENT SOLUTIONS FOR EMPLOYEE TRANSPORTATION

Airbus is also sensitive to environmental and safety issues concerning its employees. The company adresses onsite and offsite transportation issues by organising safer and more efficient transport services and circulating rules/information.



## **CASE STUDY**



# **GREENER COMMUTING**

To facilitate the need for staff to move around between different departments on site, Airbus' Filton site in the UK has increased the frequency of its onsite bus service, leading to a considerable increase in bus users (total number in 2006: 400,000)

Car sharing programmes have been set up at various Airbus sites. In Toulouse, an e-site allows employees to search for colleagues in their area in order to share journeys to work, save time and fuel, thus reducing traffic congestion, pollution and accident risks.

The week of 4 June 2007 was the annual 'Get on your bike week' for Airbus employees in Toulouse, France, promoting the use of bicycles as a means of getting to and from work. Special events included a picnic for about 100 cyclists in a park in Saint-Martin du Touch.

Workers at Airbus in the UK also have been actively encouraged to cycle to work as part of the company's green travel plan. Its UK sites at Broughton and Filton currently see nearly 1,000 employees cycling to work each week, well above the national average and a positive step towards reducing traffic congestion and air pollution. Many employees have been biking to work for many years and strongly support the approach to get fit and help the environment at the same time. Additional shower facilities for cyclists and improvements to local cycle routes have been completed or are envisaged, to further encourage more employees to use their bikes.





# CASE STUDY



# **SESAR & AIR TRAFFIC MANAGEMENT**

The SESAR project is the European air traffic control infrastructure modernisation programme. For the first time in European Air Traffic Management (ATM) history, an ATM improvement programme is involving the aviation players (civil and military, legislators, industry, operators, users, ground and airborne) in defining, committing to and implementing a pan-European programme, and supporting the Single European Sky legislation. The objectives of SESAR are to eliminate the fragmented approach to ATM, transform the European ATM system, synchronise the plans and actions of the different partners and federate resources. SESAR aims to develop a new generation air traffic management system capable of ensuring the optimal flight path, safety and fluidity of air transport worldwide over the next 30 years. Key performance targets include reducing the environmental impact by 10% per flight.

# **IN-SERVICE IMPACTS**

Today, there is a persistent demand for the air transport industry to further improve the overall environmental performance of aircraft operations and further reduce noise, emissions and fuel burn. Aircraft entering into service now are typically 20 decibels quieter than comparable products 30 years ago. An A320 taking off or landing has a noise footprint of less than 1/10th the area of that created by a similar sized 1970s tri-jet. Fuel consumption has been more than halved since 1960 and CO<sub>2</sub> emissions from aviation remain stable at 2% of total man-made CO<sub>2</sub>, emissions despite air traffic growth.

When evaluating the overall environmental impact of a long lifecycle product, it is obvious that aircraft operations as well as maintenance of the product are of major importance. For example, improving efficiency in flight operations or maintenance for an aircraft may lead to a significant reduction in the consumption of fuel or other consumables.

Particular attention is therefore given at Airbus to educating and cooperating with customers and business partners. Airbus is committed to ensuring each aircraft is operated in the most appropriate and eco-efficient manner (focussing on fuel burn and emissions, local air quality and noise). The company especially works to ensure the aircraft is used in line with applicable standards or regulations and in accordance with the design performance of the aircraft as delivered.

## SUPPORTING OPERATIONAL PERFORMANCE

Airbus has developed flexible and modular support solutions with a comprehensive range of services covering all aspects of airline operations. Due to the number of in-service related queries received from airlines, a network has been established between Airbus' Customer Support and Engineering specialists to answer customer questions on fuel consumption and efficiency, air emissions and noise. In Airbus' Customer Service activities, several actions have been launched within the framework of Airbus ISO 14001 certification to reduce environmental impacts related to aircraft operations.

It also is essential to limit environmental impacts during the maintenance phase of the aircraft. A 2007 environmental customer questionnaire identified maintenance issues, such as worker safety and hazardous waste management (for example in cleaning, corrosion control, ground handling, stripping and repainting of the aircraft), as top concerns. Through appropriate documentation, training and education of maintenance operators and customers, Airbus can continue to effectively address these issues.



# **FUEL & EMISSIONS**

# OPTIMISING FUEL EFFICIENCY

The air transport market is significantly impacted by external factors; fuel is one of them. The sharp increase in fuel price experienced in the first half of 2008 has driven fuel towards the highest airline cost unit, ahead of labour. It has doubled since 2004. Obviously, airlines are looking daily at better controlling every cost aspect, while maximising the utilisation of their fleet.

As aircraft  $\mathrm{CO}_2$  emissions are proportional to fuel burn, reducing fuel burn is a win-win solution that reduces both the airlines' direct operating costs and the impact on the environment. Reducing fuel burn of its aircraft is and has always been a key priority for Airbus. Since the company's beginning, developments in technology have helped drive dramatic improvements in aircraft performance.

One major effort is the continuous and progressive introduction of advanced materials and new processes to reduce the basic weight of an aircraft to minimise fuel consumption in service and, subsequently, the level of engine emissions. Today's aircraft are 70% more fuel efficient than 40 years ago and emit 70% less CO<sub>2</sub>. Furthermore, aircraft operations are 20% more fuel-efficient compared to just 10 years ago. The A380, for example, consumes less than 3 litres per passenger seat per 100 kilometres – this is 20 years ahead of today's fleet.

## AIRBUS AND CLIMATE CHANGE

Climate change is one of the key issues in our modern world that may have environmental, social and economic consequences if proper actions are not undertaken rapidly. Airbus is aware and understands the impact of its products and processes on climate change. Although there are still some uncertainties with regards to the impact of certain emissions, Airbus remains very attentive to the knowledge improvement within the scientific community. Working on a long-life cycle product, Airbus needs to best assess and possibly anticipate the present and future impacts of its products.

## CASE STUDY



# **FUEL CONSUMPTION & EFFICIENCY**

Several "Getting to grips" advisory publications have been issued to customers over the past few years that provide airlines with tips on reducing their fuel consumption. Building on this, Airbus is now looking at offering a full range of after sales services to its customers, covering training, consulting services, as well as innovative software.

## **CASE STUDY**



# CARING FOR CLIMATE INITIATIVE

As a Global Compact member, and to demonstrate its leadership in tackling climate change, Airbus was one of the initial signatories of the initiative "Caring For Climate; the business leaders' platform". This is a platform of commitments developed by the Global Compact, the United Nations Environmental Program (UNEP) and the World Business Council for Sustainable Development (WBCSD). For more information go to: www.unglobalcompact.org

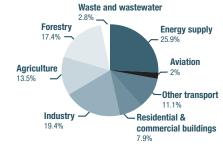
# **FOCUS**

# **Aviation and Climate Change**

Aviation is a relatively small contributor to the global greenhouse effect. It accounts for only 2% of all man-made  $CO_2$  emissions and is expected to contribute only 1% more by 2050, despite current growth trends.

Nevertheless, the industry recognises its environmental responsibilities and has committed to a pathway to carbon-neutral growth in line with IATA's four-pillar-strategy on climate change: invest in technology; fly planes effectively; build and operate efficient infrastructure; and use positive economic incentives.

### SHARE OF DIFFERENT SECTORS IN TOTAL ANTHROPOGENIC GHG EMISSIONS\*



\*(in 2004 in terms of CO $_2$ -eq.; forestry includes deforestation)

**Source: IPCC, Synthesis Report Climate Change 2007** 





# ALTERNATIVE ENERGY

Airbus supports and is actively cooperating in the industry's vision for aviation to achieve carbon neutral growth and aspire to a carbon-free future.

To progress towards that goal, several research programmes have to be carried out, including the development of alternative energy sources for aviation such as alternative fuels or fuel cells.

## **FOCUS**

# **Developing alternative energy sources for aviation**

#### Airbus alternative fuels research

Airbus has defined a global roadmap on alternative fuels, integrating research, partnerships, test flights and cooperation with fuel standard certification authorities.

For a possible introduction of alternative fuels in a short time frame, only synthetic fuels are considered as drop-in fuels. Among them, as the technology readiness level is quite low for hydro-treated vegetable oils, fuels produced through a Fischer-Tropsch (FT) process are primarily considered. Biomass-To-Liquid (BTL) fuel appears to be the most sustainable alternative fuel. Airbus has decided to focus its research and activities on second-generation biofuels only, i.e. biofuels that do not compete with food for water supply and land need, and that would not induce additional deforestation. Although these fuels will not be produced in significant quantities within the next 10 years or so, Airbus believes that they could provide up to 30% of all commercial aviation jet fuel by 2030. That is why Airbus has teamed up with Honeywell Aerospace, UOP (a Honeywell Company), International Aero engines (IAE) and JetBlue Airways to pursue development of a sustainable second-generation biofuel for use in commercial aircraft. In parallel, Airbus is also engaged in partnerships and research activities on Gas-To-Liquid (GTL) fuel, a synthetic fuel made from natural gas via a Fischer-Tropsch process. The "life cycle" CO<sub>2</sub> emissions from a GTL process are expected to be comparable to conventional fuels, and as some environmental benefits can be measured for local air quality (very low particulates, no sulfur-related emissions), GTL can be reasonably used as a precursor for BTL. Indeed, any fuel produced through a FT process will have the same properties in the end, whether BTL or GTL.

In November 2007, Airbus announced a partnership with Rolls Royce, Qatar Airways, Qatar Petroleum and Shell to investigate the potential of GTL fuel. In February 2008, an A380 test aircraft was successfully flown between Filton and Toulouse with one engine powered by GTL. The whole flight envelope was flown and the engine behaviour was observed in various challenging flight modes. The aircraft performance indicated no major difference compared to a similar flight with conventional fuel. Further engine ground tests will be made and emissions will be compared with those of kerosene. The team will be using the results to predict the environmental benefits and define the next steps. In order for an alternative fuel to qualify for commercial aviation, review and approval by the international fuel standards is a pre-requisite. Airbus is committed to this goal, and it is hoped that this will be obtained for full GTL by 2013.

## **Fuel cells**

A fuel cell is a device that transforms the energy contained in hydrogen into electricity, by combining the hydrogen with oxygen in a "cold" combustion. Fuel cells could eventually replace aircraft functions that currently require the Auxiliary Power Unit (APU), such as main engine start and air conditioning, thus paving the way towards emissions-free ground operations. The exhaust product is water, which could be used for the aircraft's water and waste system, saving weight and, therefore, reducing fuel consumption.

In February 2008, Airbus, with its partners, the German aerospace centre (DLR) and Michelin, successfully performed the first test flight on a civil aircraft (A320) where a fuel cell system provided the power for the aircraft's electrical and hydraulic back-up systems. The test flight was carried out on an A320 test aircraft owned by the DLR. During the test, the fuel cell system produced up to 20 kilowatts of electrical power. It powered the electric motor pump for the aircraft's back-up hydraulic circuit and controlled the spoilers, ailerons and elevator actuator.

Currently, fuel cell systems for commercial aviation are still at an early stage of research & technology and today, it is not readily foreseeable that they would be used for commercial aircraft propulsion. This requires a thousand times the electric energy that was produced during the A320 test flight. To use fuel cells more extensively on-board commercial aircraft, further improvements need to be made in terms of the amount of energy they produce versus their weight (ratio kilo watt per kilogramme).



# LOCAL AIR QUALITY

The local air quality (LAQ) around an airport is determined by the amount of pollution released in the air by the activities of and around the airport: they include industrial activities around the airport, land transportation networks (motorways, roads etc) to carry passengers and freight to and from the airport, and the activities that are carried out within the airport boundaries. The latter must take into account all land vehicle activities (buses, refuelling and catering trucks etc) together with aircraft operations (on ground and below 3,000 feet as per ICAO definition). It is thus quite difficult, when measuring the local air quality around an airport, to establish a clear distinction between the impact of emissions resulting from the overall activity and emissions resulting from aircraft engines operations.

Nevertheless, aircraft engine emissions are regulated and submitted for certification. The certification standards are established, published in the Annex 16 of the Chicago Convention and regularly reviewed by the competent experts. The 7th meeting of CAEP, ICAO's committee on aviation environmental protection, in 2007 proposed a package of recommendations to address aircraft engine emissions directly attributable to aviation in relation to local air quality and global climate effects. Furthermore, the environment committee of ASD, the Aerospace and Defense Industry Association of Europe, chaired by Airbus in 2007, launched a series of briefing papers with topics such as local air quality to be covered in the coming years.

As an aircraft manufacturer, Airbus' responsibility is to minimize the impact of aircraft operations on local air quality. To that purpose, several actions have been undertaken:

- Cooperation with airlines and airport authorities: in order to minimise the use of engines and the auxiliary power unit (APU), some procedures may be established and implemented such as single engine taxi (at least for taxi-in), late engine start, avoiding long taxiing distances, and use of electrical ground power units (GPUs) to replace APUs
- Cooperation with airlines and air traffic management: to develop and implement flight procedures that reduce the time and distance of flights below 3,000 feet
- Integration of LAQ concerns in the design of our aircraft: the aircraft systems must be capable of flying the new type of procedures with the highest levels of safety, and with no additional work for the crew
- Evaluation of alternative energy use: to account for the absence of GPUs at some airports and/or the need for airlines to perform short turn-around times making it difficult to use GPUs, Airbus also aims to provide alternative energy solutions. Gas-to-Liquid kerosene also has some LAQ benefits (very low particulates, no sulfur-related emissions) that will soon be quantified through additional ground tests



# **CASE STUDY**



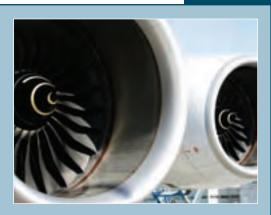
# CONTINUOUS DESCENT APPROACH – 1st trans-Atlantic green approach trial

The use of Continuous Descent Approaches (CDA) contributes to reducing noise, fuel burn and emissions (both from a local and a global point of view). The Scandinavian airline SAS concluded the first commercial trans-Atlantic green approach trial, on December 8th 2007, with an A330 aircraft on a flight from Newark (US) to Stockholm (Sweden). "The engines were running at idle power from our cruise altitude until the final stage of the approach. The aircraft's Flight Management System was automatically flying the whole approach routing and the passengers perceived the approach as nothing but smooth and quiet," says Sigmund Lockert, Airbus A340/330 Fleet Chief Pilot, Scandinavian Airlines, who was also First Officer on that day's flight. SAS estimated that a trans-Atlantic green approach with an Airbus A330 will initially save approximately 150 kilos of aircraft fuel and 470 kilos of CO<sub>2</sub>.





# CASE STUDY



# A QUIET INNOVATION

A team of Airbus engineers received the 'Decibel d'Or' Award from France's Minister for Ecology and Sustainable Development for a new innovation in soundproofing for aircraft engines. The new Airbus patented invention has already been installed on the A380, contributing to the low noise levels registered during the aircraft's acoustic certification process at the end of 2006. The new form of sound-proofing, called 'zerosplice' inlet, is the result of six years of close cooperation between Airbus air intake design and manufacturing methods departments. It contributed to making the Airbus A380 the quietest long-range passenger aircraft ever manufactured. The single-splice inlet uses a single section tube rather than the conventional intake liner which had two or three pieces joined together. Eliminating these joints, or splices, significantly reduces the induced aerodynamic noise that partly offset the acoustic absorption of the fan noise from the inlet. The technology will now be fitted as standard on all future Airbus aircraft, including the A350 XWB.

Building on the concept of the zero-splice inlet, Airbus' nacelle acoustics engineering team is now working on the next generation of Airbus inlet, called the RAMSES (Reduced Acoustic Mode Scattering Engine Duct System) inlet. RAMSES will bring noise levels down further by reducing the noise made by the fan case liner, which is located between the fan and the intake liner.

# **NOISE**

Among the various environmental concerns, aircraft noise has been constantly growing in importance over the past years. Its various effects on man, especially on the people living in the vicinity of civilian and military airfields, must be studied to allow the determination and continuous refinement of indices reflecting noise impact, in order to develop an appropriate noise policy.

With air transport activity being a global industry - both in terms of manufacturing and operations of the aircraft - it is very difficult to cope with various different local rules aimed at reducing the local noise burden. The air transport industry requires worldwide-agreed business practices and to that purpose, it is necessary that any regulatory framework be set on an international basis. ICAO is the only recognized body that can establish such Standard and Recommended Practices through its Committee on Aviation Environmental Protection (CAEP). Airbus supports the ICAO leadership in the establishment of environmental recommendations that are then the basis for national laws in the different ICAO Member States. Thus the ICAO leadership for operational recommendations is highlighted, as well as the means provided by Airbus, to fully optimize airlines' operations in a noise level constrained context, and with the highest level of safety.

Airbus' philosophy remains, as always, to provide airlines with all necessary support and associated tools for the optimization of flight operations. The company has thus developed policies and research, notably on reduction at source and operational measures, and procedures on noise. Airbus continues to achieve significant reductions in noise levels in close working relationships with airlines, engine manufacturers and airports.

# TRADE-OFFS

When a new aircraft is designed, its performance must have significantly improved upon former comparable models to enable it to enter the market and replace them. As far as environmental performance is concerned, new aircraft provide sensitive improvements in terms of noise, engine emissions and fuel burn, leading to an "optimum" design point. If for any reason one parameter needs to deliver even better performance (driven by political or societal expectations) this additional performance does not come without compromise and some trade-offs need to be considered with other parameters. The typical trade-off is between noise and fuel burn (and thus CO<sub>2</sub>).



# NOISE CERTIFICATION PROCEDURES

All new aircraft are required to meet strict noise-certification standards adopted by the International Civil Aviation Organisation (ICAO) Annex 16. A strengthening of that standard known as Chapter 4, effective since January 1st 2006, is the required level for any new aircraft entering its certification process. All Airbus in-production aircraft have noise levels eligible for Chapter 4 standards certification.

# NOISE REDUCTION-AT-SOURCE

Aircraft currently entering into service are typically 20 decibels quieter than comparable products 30 years ago. An A330 taking off has its noise footprint (at 85 dB(A)) contained within the airport's perimeter. The A380 is the quietest long-range aircraft on the market, with even lower noise levels than the A340 (one of the quietest aircraft of its kind) for twice as many passengers. It also meets the stringent requirements for night operations at London airports - QC/2 for departures and QC/0.5 for arrivals.

Airbus has furthermore commited - in the framework of the ACARE targets - to designing aircraft that are 50% quieter in perceived noise than aircraft designed in 2000. This will be achieved by working on solutions such as low-noise nacelle design, acoustic treatments, overall aerodynamic efficiency and optimised propulsion system installations in close cooperation with engine manufacturers.

# OPERATIONAL NOISE-ABATEMENT PROCEDURES

In order to optimise flight paths close to airports and to reduce the impact of aircraft noise on the ground, Airbus cooperates continously with airlines and airports. There are several methods, including preferential runways and routes, as well as noise abatement procedures for take-off, approach and landing. The appropriateness of any of these measures depends on the physical lay-out of the airport and its surroundings, but in all cases the procedure must give priority to safety considerations. Airbus is committed to providing airports and airlines with the best technological and planning information, such as traffic forecasting, optimum flight profiles, specific noise-reduction studies and training for Airbus aircraft operations, particularly on noise-sensitive airports.



# CASE STUDY



# **OPTIMAL PROJECT**

OPTIMAL is an air-ground co-operative project, partly EU-funded, bringing together 24 companies and institutions. The project, running between 2004 and 2008, is coordinated by Airbus and aims to define and validate innovative procedures for the approach and landing phases of aircraft and helicopters in a preoperational environment. The goal is to minimise external aircraft/helicopters noise nuisance and increase the ATM capacity, while maintaining and even improving safety.

Main Airbus achievements include three new aircraft functions:

Continous Decent Approach (CDA)

Required Navigation Performance (RNP)

Autonomous Flight Landing System (AFLS)





# AIRCRAFT End-of-life



## PAMELA KEY ACHIEVEMENTS

- First successful full-scale demonstration project related to End of Life of Aircraft (ELA)
- Design of a generic methodology applicable to any kind of aircraft
- Identification of best practices recommended to ELA industrial platforms
- Feed-back of lessons learned to Design Offices and Supply Chain
- Demonstration of need to establish and further develop a reverse supply chain
- Increased valorisation ratio 80-85% (instead of 40-50%)
- Demonstration of re-use + recycling ratio> 70% in weight
- Promising results for metallic material recycling, especially aluminium
- Significant reduction by factor 3 of landfilled waste (<15% vs. 40-45%)</li>

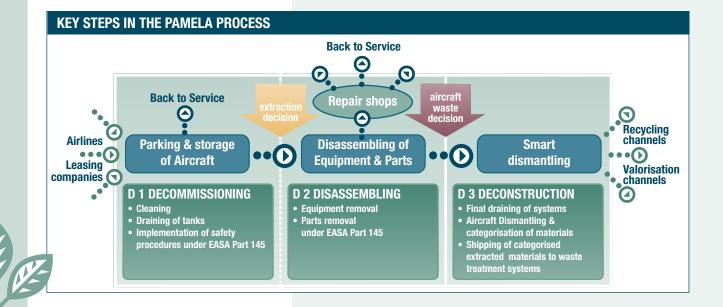
# RESPONSIBLE PRACTICE

Airbus' long-term forecasts anticipate an increase of aircraft withdrawal from service in the coming decade, leading to some 6,400 aircraft reaching their end-of-life by 2026. Considering this expected increase, the management of end-of-life must be addressed in a responsible manner. The first Airbus aircraft retirements from operations are now occurring (closure of the A300/A310 production in July 2007).

Traditionally, old airliners end their life stored in deserts or in remote areas of airports. Some of them are wildly destroyed to recover non-ferrous metals. At best, current practices do not allow recovering more than 60% (in weight) of aircraft materials. This situation is no longer acceptable. Not only it is potentially environmentally damaging through the release of hazardous materials and soil pollution, but it also presents safety risks through the uncontrolled re-use of second hand spare parts. Last but not least, it is uneconomical as only a small part of the materials is recycled.

Airbus has thus joined forces with key partners to draw up and disseminate a process capable of decommissioning and dismantling aircraft in safe and eco-efficient conditions. This will avoid uncontrolled practices, achieve an appropriate material recycling rate and control the second-hand spares market to ensure aviation safety.

A dedicated project, led by Airbus and named "Process for Advanced Management of End-of-Life of Aircraft" (PAMELA), was set up between 2005-2007 and is now being followed up by an industrial phase under TARMAC-AEROSAVE (Tarbes Advanced Recycling and Maintenance Aircraft Company), the first industrial company to manage end-of-life aircraft.



# PAMELA DEMONSTRATION PROJECTS

In March 2005, with its partners Suez-SITA, EADS CCR, EADS-Sogerma Services and the Préfecture des Hautes-Pyrénées, Airbus set up a special experimental centre at Tarbes Airport (South West of France). Here, procedures for decommissioning and recycling aircraft in safe and eco-efficient conditions were developed and tested. The experimental project on an Airbus A300 aircraft was selected as part of European Union's LIFE programme. The PAMELA LIFE project, which supplied it's final reports in January 2008, demonstrated that up to 85% of an aircraft's components can be easily recycled, reused or recovered, with 70% reuse and recovery. The experience gained in dismantling and recycling can then be fed back into the Airbus life cycle (reverse engineering, manufacturing, supply chain, raw material etc.), helping to make future aircraft even easier to recycle.

In April 2007, under the framework of the PAMELA A380 project, the team started work on dismantling the A380 static test airframe (350 tonnes). This was the first time that the preservice testing of a new aircraft type had been taken right through to the very end of its life cycle.

# TARMAC-AEROSAVE: THE INDUSTRIAL PHASE

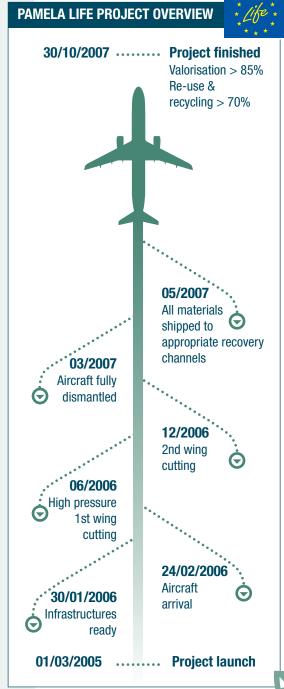
The PAMELA demonstration projects are now being followed up by a second, more industrial phase called TARMAC-Aerosave, a joint venture between Airbus, waste management company SITA France, maintenance and parts specialists TASC Aviation (an Airbus company), Snecma Services, Equip' Aéro and Aéroconseil. A teaming agreement has been set up with these partners in order to create the Airbus end-of-life centre of reference in Tarbes, France.

TARMAC-Aerosave will benefit from the dismantling and recycling practice lessons learned. It will be the first industrial company to manage end-of-life aircraft. The facility will be capable of storing up to 22 aircraft, offering customers short-term storage, maintenance and dismantling services.

Services will enable customers to dispose of end-of-life aircraft in an optimal and environmentally friendly way. The company will be able to recover equipment and parts that still have potential use, respecting aviation safety and environmental rules, while ensuring the traceability of all spare parts.

Once the business model is in place, Airbus plans to set up a worldwide network of labelled dismantling centres to provide and encourage the best environmental practices and safe operation of its aircraft across their lifespan. TARMAC Aerosave is also set to take part in research into ageing aircraft with Airbus' engineering teams and local university research centres.









A series of management changes, industrial concerns with the A380 programme and the weakening of the dollar in 2006 and 2007 have brought significant challenges for employee motivation and a need to improve integration within the company. Airbus believes that only when employees are fully engaged in a change culture, and in an integrated company, can shareholder and customer satisfaction be met.

# AT A GLANCE

Airbus is committed to developing employees' skills and competencies, promoting social dialogue and ensuring safe working conditions. The company is currently taking significant steps towards building the "new Airbus".

# **KEY 2006-2007 ACHIEVEMENTS**

- New organisation set-up, in particular going from mainly nationally driven Centres of Excellence (CoE) to a fully trans-national organisation (p46)
- Appointment of a Chief Ethics & Compliance officer (p46)
- Launch of "Power8" as company turn around programme, including an overhead cost reduction project (p46)
- 125,769 hours of EHS training (p53)

# **AIRBUS' PRIORITIES:**

- Reinforce performance management and support managers in leading a high performance culture
- Restore employee engagement through yearly surveys and resulting action plans, starting in 2009
- Ensure succession planning is in place for all experts and key managers
- Recruit more women, more non-Airbus nationals, and more non-European employees
- Establish constructive, open, objective, responsive and transparent social dialogue and partnerships
- Further develop the key competencies of the company
- Launch a corporate foundation





The foundations
of this company
are very solid;
I believe that the
changes underway
are the right ones
to ensure a
brighter future.

Thierry Baril, Executive Vice President Human Resources





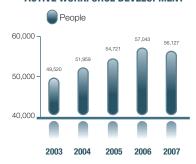
# AIRBUS Approach



# **KEY FACTS**

- Airbus is an EADS company
- President and CEO: Thomas Enders
- **●** Employees: 56,127 (2007)
- More than 80 different nationalities

## **ACTIVE WORKFORCE DEVELOPMENT**





# **POLICY & MANAGEMENT**

## BUILDING THE 'NEW AIRBUS'

Although the number of aircraft orders reflects a continuous high demand for Airbus' products, the company has, over the past two years, faced industrial setbacks related to the A380 and a weakening dollar that challenges Airbus' ability to remain competitive. In light of these impacts, Airbus took the opportunity, in early 2007, to launch a major four-year competitiveness programme called "Power8" that should lead to a complete turn around of the company and is already delivering initial results.

The programme's objective is to build a "New Airbus", a fully integrated company, focused on its core business with improved processes that will allow it to develop new products faster, maximise cash and put in place an overhead cost reduction project. Significant steps were made in 2007, for example by reducing the former eight, mostly national, Centres of Excellence to four fully transnational organisations.

Tom Enders, previously Co-CEO of EADS, was appointed President and CEO of Airbus in September 2007, following several Airbus management changes and a simplification of EADS' organisational structure. A new, simplified, leaner Airbus top management team was appointed at the same time, comprising nine members, three less than previously. The new structure allows for clear leadership and accountabilities, enables faster decision-making and better integration of processes and functions all across the company.

# **ETHICS & COMPLIANCE**

In 2008, at the direction of Tom Enders, Airbus took the positive step of consolidating and optimising its corporate ethics and compliance efforts. A central Ethics & Compliance Programme and organisation was created to integrate and provide oversight and coordination of on-going ethics and compliance efforts throughout the company.

Airbus' first Chief Compliance Officer has been tasked with putting together a programme that integrates current efforts, while bringing greater efficiencies and harmonisation to the system. The centralised programme will be designed to better detect, monitor, prevent, and report any significant lack of compliance with applicable laws and regulations. It will seek to further strengthen the Airbus culture of ethical behaviour. This endeavour naturally flows from EADS Vision 2020, which highlights, as one of our corporate responsibilities, the need for "promoting ethics, compliance and transparency throughout EADS."

In line with the EADS Code of Ethics, Airbus updated its internal Airbus Code. The new code has been made available to all Airbus employees and an awareness programme is being developed so that every Airbus employee progressively acquires the internal culture of ethics and compliance. A deployment plan is under the responsibility of the Compliance Programme officer (who is also the owner of the Airbus Code).

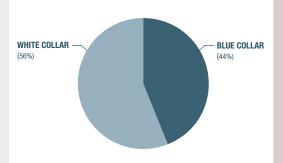
# **HUMAN RESOURCE POLICIES**

At Airbus, the values and requirements related to Ethics and Diversity, which have been cascaded from the EADS Code of Ethics to the Airbus Code, are deployed through Human Resource strategies, policies and procedures. The HR Strategies define, at an overall company level, the general direction and principles for Human Resources and are supported by the company's HR policies.

Airbus' HR Policies and Procedures (e.g. promotion of cultural diversity, fair employment, mutual trust, fair and equal recognition without discrimination, recognition of outstanding excellence, etc.) have clear ownership and are subject to regular audits, which include internal audits, but also audits by external bodies within the framework of EN9100 certification, ISO 14001, etc. The results of audits and actions taken to address non-conformities, weaknesses or possible improvements are regularly followed-up.







# **AIRBUS HR STRATEGIES 2006/2007**

### **Organisation Development**

We structure our operations to ensure that we work as efficiently as possible, continuously adapting and improving. We favour a matrix approach that is both transnational and cross-functional, supported by streamlined business processes and local leadership.

### **Employment**

We are a socially responsible employer; we strive to assure long-term employment of our workforce through the anticipation of cyclical industry changes. In return, employees are expected to set standards of excellence in their areas of expertise and to support the company's actions in managing the evolution of its core business.

### **Employee Relations**

We are committed to maintaining a constructive, open, objective, responsive and transparent social dialogue and partnership with our employees and their representatives at both the local and trans-national level. We recognise the strong national specificities in our entities, but we expect our employee representatives to help shape our future by having a shared understanding of our vision and goals.

# **People & Leadership Development**

We see the continual development and expansion of the skills and competencies of our people as key to our sustainable success and central to the interests of all our stakeholders.

## **Health and Safety**

An integral part of our role as a socially responsible business is our commitment to provide all who work in, or visit, our locations with an environment that is always healthy and safe.

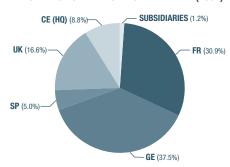
## **Reward and Recognition**

Airbus offers its employees a wide range of pay, benefits and other related programmes to reward and recognise both individuals and teams for their responsibilities, behaviours and contribution to the achievement of the company's goals.



# AIRBUS People

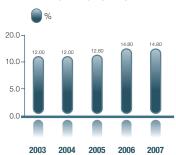
#### PERCENTAGE OF EMPLOYEES PER ENTITY (2007)



#### **AVERAGE AGE OF EMPLOYEES PER ENTITY**



## PERCENTAGE OF WOMEN



FR France GE Germany SP Spain UK United Kingdom CE Central Entity

# **DIVERSITY**

Because it began life as a European consortium, Airbus understands first-hand that cultural diversity can offer a substantial advantage. And so, the company continues to seek opportunities to expand and benefit from its culturally diverse workforce, reinforcing its commitment to combine global knowledge with local understanding.

The multi-cultural team of people at Airbus ensures that the company is well-placed to fully understand the needs of its customers, suppliers and industry stakeholders all over the world and to reap the rewards of the opportunities that these needs create, in what is perhaps the most culturally diverse industry in the world. Airbus understands that it is people who design, build, sell and support aircraft – not machines or processes – and some 56,000 people of more than 80 different nationalities provide the talent, vision and hard work that keeps Airbus at the forefront of the industry. At Airbus, national roots are valued and different cultures mix, sharing experience and knowledge, and developing expertise together in a stimulating environment.

But diversity at Airbus is about more than nationality – the company values diversity in gender, culture, spread of generations and experience, and provides fair employment opportunities without discrimination. For example, an increasing number of women are being employed in what are seen as traditionally male roles such as engineering.

In the mid-term future, Airbus has committed to stretching the goals to recruit more women, non-Airbus nationals and non-European employees as key priorities.

## CASE STUDY



# WORKING IN A WORLD OF MEN

After joining Airbus in 2004 as a test technician at Airbus in France, Daphné Carrere became the first woman in the company's history to work as an engine run-up technician. Her skills and personal qualities have enabled her to be accepted in a traditionally masculine domain. The engine run-up technician carries out engine tests, aircraft taxiing and braking tests. They also test all the avionics systems with the engines running.



# SOCIAL DIALOGUE

At Airbus, social dialogue takes place at a local level, namely with works councils. At the corporate level, the European Committee Airbus (ECA), made up of employee representatives from all Airbus entities and management, met 18 times in 2007 to discuss issues relating to the restructuring of Airbus, focusing mainly on the Power<sup>8</sup> modules, the very detailed New Airbus Organisation and the Reduce Overhead Costs (ROC) and Site Divestment (ZEPHYR) modules.

Taking the importance of these topics into account, the meetings were often held with the ECA Select Committee, which consists of one member (including the two co-chairmen) of every national entity, plus two transnational employee representatives and full assemblies of all 20 ECA members.

Airbus promotes open dialogue between management, employees and their representatives on all matters that affect employees. Legal regulations, historical issues and culture lead to this being organised at the most appropriate level: transnational, national or site. The day-to-day business issues are discussed between management and employee representatives at the local or entity level.

The ECA provides the vital interface among corporate management, employees and their representatives for working conditions company-wide. Created in 2001, it provides a platform for the continuous exchange of views and discussion on all trans-national matters affecting Airbus. Throughout 2007 and the beginning of 2008, the ECA's activities were mainly dedicated to overcoming the organizational challenges Airbus currently faces. So, the Power8 project was the main topic of the numerous full ECA assemblies and select committees. In addition to this important project, the ECA has further expanded its role of establishing a trans-national company culture, facilitating dialogue across Airbus. It dealt with a series of key issues affecting employees across the company, including globalisation, international co-operation and partnerships (particularly with regard to China), employment strategy and adaptability measures to support the production ramp-up, new aircraft programmes, health and safety, headcount and budgets.

In addition to Airbus Employees Representatives institutions, the EADS European Works Council completes the social dialogue. It is in charge of discussing with management the most strategic issues such as questions of ethics, further expanding the involvement of Employee Representatives, and all issues at Metal Workers Federation level.



# **EUROPEAN COMMITTEE AIRBUS (ECA)**

Airbus promotes an open dialogue with employees and employee representatives. At the corporate level, the European Committee Airbus (ECA) plays an important role in social dialogue.

The ECA was created in 2001 and is made up of employee representatives from all Airbus entities and management. It provides a platform for the continuous exchange of views and discussion on all trans-national matters affecting Airbus.

The ECA consists of:

- 2 chairmen
- 2 transnational experts
- 5 members from France
- 5 members from Germany
- 4 members from the UK
- 2 members from Spain

In addition to Power<sup>8</sup> (as a main recent topic), the ECA deals with issues such as globalisation, international cooperation and partnerships, employment strategy and adaptability measures to support the production ramp up, new aircraft programmes, health & safety, headcount and budgets.



# AIRBUS People



# **CASE STUDY**



# CUSTOMER SERVICES: Enhancing people skills and motivation

Airbus is aware of the need to ensure the appropriate level of resources in Customer Services and the importance of its people's motivation. Consequently, in line with Human Resources initiatives, the company focuses on high added-value activities that address the skills, competence management and people motivation.

In the framework of "Customers FIRST", a project and working stream "Enhance people skills and motivation" has been put in place in 2007. The objectives of the project are to ensure the appropriate level of resources in terms of competencies, to stimulate staff motivation and to ensure change management in line with the Airbus initiatives "Optimize Skills", "Airbus Skills Management Organisation" (ASMO) and "Training Academies". Recent achievements include the set up of an "S Academy" and the identification of training solutions.

"We must be proud of our customers' satisfaction, as this is the ultimate reward. We are facing an extraordinary growth in activity at a time when the customer is changing a lot. We need to accompany that change — and prepare our skills for the future. As part of this, we have put a customer services academy in place, to develop the necessary competencies within Airbus."

**Nicole Lecca, Head of Customers First** 

# SKILLS & COMPETENCE

Airbus recognises how critical it is to attract, develop and retain both its internal workforce and extended enterprise resources in order to deliver on the challenging industrial, financial and social objectives it has set for the short, mid and long term.

To this end, starting with the recommendations from an internal audit in June 2002, Airbus has defined a framework, a catalogue of competencies, and the processes and tools required to manage these competencies. This has been done, from the beginning, in close cooperation with the business areas, with the intent of supporting the implementation of business strategies.

Since the end of 2007, the focus has been on the short term and individual aspects of skills management: identifying skills gaps in people's current positions and reporting on individual and collective gaps for internal employees. With this approach, the number of validated position/employee profiles, following an interview between direct manager and employee, rose to 19,182. This information is stored and is exploitable - only by authorized users - from the corporate HR IS system (SAP based).

The focus in 2008 is three-fold:

- Enhance abilities to estimate future needs (mid and long term 'demand') in line with company strategy
- Enhance abilities to simulate future workforce (mid and long term 'supply') and to take actions to close the perceived gaps between supply and demand
- Expand the involved population to cover not only internal Airbus employees, but also temporary workers where appropriate, as well as potentially subcontracted packages or risk sharing partners

All of the above aspects will be piloted - and relevant supporting processes and tools developed - in a limited perimeter as set forth in the Airbus Key Competence 2008 project. The set of key competencies will be revised each year and concrete gap closing actions launched by HR, in conjunction with the business.

The set of gap closing actions is aligned with, but not limited to, the training plan: a whole portfolio of solutions in remote learning, recruitment (external and internal mobility), knowledge management, career development, employment marketing and exploration, professional recognition schemes and tutoring / mentoring schemes are envisaged alternatives.



The choice of the best mix of gap-closing solutions is taken jointly by HR and Airbus' management and social partners, according to the circumstances and priorities defined by the company.

All in all, these actions will improve awareness among the Airbus workforce of what is expected from them in the short term, what learning actions can help fill a potential gap and what evolutions can be expected in the competencies required by Airbus in the mid- and long term. This will ensure that the adaptation of Airbus' evolution to its projected workforce and of the workforce to Airbus' needs renders the best global results.

At the group level, EADS is launching an intensive and comprehensive work plan on the subject of competence management, due to its key contribution in supporting Vision 2020 objectives. Airbus is committed to work to further align around group-wide initiatives as this is seen as delivering the best value:

- For shareholders (avoid duplication and reduce costs)
- For employees (fostering the increase of opportunities and transparency on the evolution of the internal market place)and in general for the communities in which Airbus is present (delivering job opportunities for markets in which Airbus and EADS are establishing their footprints)

# **CASE STUDY**



# ENGINEERING ACADEMY: CREATING A LEARNING ORGANISATION

Since 2006, Airbus has been working to co-ordinate and harmonise all engineering training and learning activities across the company through the new Engineering Academy. Launched as part of the RACE (resource and competence in engineering) project, the Engineering Academy team finalised the formal organisational structure in 2006 and ran a pilot phase of the concept in 2007. The academy aims to be a learning organisation within Airbus and to oversee all engineering training schemes, ensuring that they correspond with Airbus' engineering industrial strategy.







The Engineering Academy will
ensure that strategic
objectives taken at the top
level, leading to operational
changes at the engineering
level, are properly
accompanied by training. We
have to anticipate and
prepare the adaptation,
reinforcement and
development of engineering
competencies to address
future Airbus challenges

Henri-Jean Braudel, Head of Engineering Competence Development

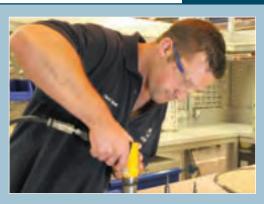




# HEALTH & Safety

# INCIDENT RATE Reportable accidents x 1000 – workforce 30.0 20.0 14.0 13.2 12.6 10.6 11.2 2003 2004 2005 2006 2007

# **CASE STUDY**



# OCCUPATIONAL H&S ASSESSMENT STANDARD 18001, AIRBUS IN THE UK

Airbus sites in Filton and Broughton have launched a certification process for the Occupational Health and Safety Assessment Standard (OHSAS 18001). The overall objective for Occupational Health and Safety was to provide a management framework, consisting of a variety of tools & techniques, enabling Airbus to control risks and to improve performance. In particular, this concerns the requirements to establish an occupational health and safety management system (OH&SMS) that will eliminate or minimise risk to all persons associated with or exposed to hazards. It also means implementing, maintaining and continually improving the system, ensuring safe places of work and safe working practices, thus ensuring conformance with the stated site/Corporate procedures and other standards (e.g. quality and compliance with all relevant legislation).

# 

# **POLICY & MANAGEMENT**

Today's health and safety policies focus primarily on prevention. Ultimately, therefore, Airbus' objective is to prevent risks from developing in the first place. Airbus is committed to ensuring that all its employees and operators are working in a safe environment, because the mental and physical health of its employees is integral to the company's performance.

Airbus promotes and upholds a high level commitment to the health and wellbeing of employees, and involves its employees and staff representatives in the design and layout of their workplaces. Work systems, products and services are designed according to health, safety, and ergonomic requirements. Thus, at Airbus, health and safety concerns affect all processes and organisation levels.

Performance on health and safety objectives is a determinate of senior management remuneration and its importance is regularly emphasised in the yearly key objectives of the company. Health and safety considerations are also an assessment criterion for the Airbus internal awards of excellence.

# HEALTH AND SAFETY MANAGEMENT SYSTEMS

Planning and analysis are becoming increasingly important to protect employees from accidents and job-related illnesses. Therefore, systematic processes and management systems are relied on to play a central role. The Airbus' Environmental, Health and Safety (EHS) Policy is consistently implemented by all Airbus functions, national entities and subsidiaries. They perform daily health and safety tasks, in the framework of management systems, following the policy. A health and safety network - co-ordinated at the national and corporate level supports the implementation of health & safety procedures. Improvements in the relevance of entities' systems, and hence the quality of their performance, is supported by regular audits. The Airbus Health and Safety Committee's members are appointed by the Staff Council and by employee representatives. The Committee is informed and consulted on all matters concerning health and safety.

In Germany, for example, a project on workplace health promotion, through the systematic and long-term development of interventions, was completed in September 2007. The main objectives included a positive effect on the number of sick leaves and on presence quota. The project also aimed to establish standardised fundamental processes such as the conception, analysis and presentation of health reports, or a unified position on subjects such as risk evaluation, work accidents or dealing with stress.



The milestones achieved in 2006 and 2007 include, among others, a company agreement on health in the work place; the compilation of health reports from SAP Human Resource data; the establishment of standardised criteria for training measures; a training catalogue and yearly planning and service level agreements with training centre. A yearly coordinator meeting between representatives of the Environment, Health & Safety (EHS) work council, representatives from Airbus' health insurance scheme in Germany and Airbus' work insurance association is planned to follow up defined actions.

## **TRAINING**

Airbus aims to provide continuous and tailor-made training for all employees, from shop floor workers to top managers, using modern interactive techniques such as the intranet, DVDs, etc. As a result, environment, health and safety training hours for employees totalled 125,769 hours in 2007, an average of more than 2 hours per employee. Since the beginning of 2007, all Airbus employees have been able to subscribe to training via the Airbus intranet. Online access has been very popular and reaches a greater number of interested employees. The increased demand in trainings becomes important when evaluating them. Airbus also encourages employee initiatives that help adapt available tools and ease the adoption of messages.

## AWARENESS AND COMMUNICATION

Specific awareness campaigns and continuous information efforts further ensure sharing of the health and safety culture. Airbus' internal newspapers and intranet support are used as the main channels for regularly published prevention articles that are designed to offer significant coverage among staff. Furthermore, national and international communication actions, in concordance with the entities' own action plans, support the sharing of key health and safety messages.

In the UK, the Broughton site has committed to improving road safety by working in partnership with local authorities to offer advanced driving courses for its apprentice population, and to improve cycle paths and road access. As the site and its facilities develop, it continues to work to ensure a harmonious and positive relationship with the local community.

In Spain, the objective of the "Get on board" initiative was to involve all staff in plant safety in order to raise awareness, motivate employees and integrate the prevention of risks in the workplace into production processes, with a main target of a 20% reduction in accidents. Resulting outputs were improvement proposals from people in production areas, follow-up and control of the established improvement actions, posters with 10 different slogans, informative leaflets with accident rates by area, and an EADS/Airbus competition to create posters using the campaign slogan.

# NUMBER OF EHS TRAINING HOURS



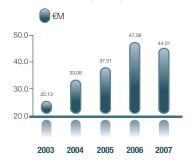
# **CASE STUDY**



# H&S TRAINING, AIRBUS IN SPAIN

At Airbus in Spain, the number of H&S training hours increased by 874% in 2007 for Shop Floor Managers (50h H&S training for Managers/Shop Floor Managers), while the number off H&S training hours for staff in general also increased (+191%). This shows a clear commitment and active involvement in health & safety by employees and responsibility toward their teams. Regular H&S meetings are conducted, as well as information awareness sessions (covering accident rates, main causes, days lost and types of accidents), an absenteeism analysis and an accident report, which has increased control over accidents. For newcomers, special training and technical support are put in place before beginning work. These total 30h, and are related to hazardous situations and dedicated to specific workstations.

## TRAINING INVESTMENT





# HEALTH & Safety



# CASE STUDY



# YEARLY ACTION 2007 IN GERMANY: "SKIN"

The "yearly actions" at Airbus in Germany address one important subject each year. The objective is to raise awareness among employees for a particular topic and to increase their interest through diverse actions. In 2007, the topic "skin" was on Airbus' agenda, in cooperation with the German health insurance company Techniker Krankenkasse and BGFTE, the German employer's liability insurance association. In the framework of the prevention campaign "the most important  $2m^2$  of your life", all sites introduced trainings on skin protection with the objective of motivating employees to prevent skin infection in the work place. The programme gave employees the opportunity to analyse their skin structure and pH value and to sign up for an individual advisory service.

# DESIGN OF WORKPLACE, FACILITIES, PROCESSES AND TOOLS

The introduction of numerous new manufacturing techniques and processes in a rapidly evolving context makes the systematic integration of health and safety concerns at all levels increasingly important to ensure a safe work environment and improve employee satisfaction. Safety in the design of workplaces and industrial processes is thus a key priority for Airbus.

Examples of safe designs include initiatives by employees, such as a bridge modification on an A340 work station at Airbus in France, winning an award for excellence in 2007. The project's objective was to modify the access to the aircraft by a new footbridge with motorized stairs and integrated platforms. This new set up – which could be applied to future programmes – resulted not only in improved safety conditions, better ergonomics and accessibility, but also in a gain in time for employees working at the station.

# EMPLOYEES WELL BEING / PROMOTION OF HEALTHY LIFESTYLES

There is a strong relationship between people's well-being, their performance at work and their home lives. Airbus seeks to provide continuous support to encourage healthy lifestyles and a constant improvement of well-being at work. This begins by integrating physical, psychological and social dimensions, especially taking into account new risks, including stress, reconciliation of family life, crisis, addictive behaviors and others. Communication, information and awareness sessions are part of a company-wide approach to promoting health and well-being. For example, all Airbus employees undergo an annual compulsory preventative medical visit. In addition, the Welfare Officer is involved in investigating and providing solutions to personal problems resulting from employees' work or private life, observing professional confidentiality at all times.



# CONTRACTOR SAFETY

With new programmes and production ramp-up, in addition to an increasing number of Airbus employees, the number of contractors and contractor companies is growing as well, in all areas of activity. Enhanced cooperation on projects leads to an integration of teams from both sides, making the difference between the two difficult to discern. These integrated and interfaced process flows need to be safe. Each employer is responsible for its workforce – Airbus for its own employees, and contractors for their own workers. But close coordination can significantly improve performance on both sides. Airbus, therefore, continues to make efforts to share standards and best practices to help contractors achieve high health and safety performance.

# **CUSTOMER SAFETY**

Airbus is committed to ensure the safety and security and protect the health of its customers (permanent residents, inspectors, crew and pilots and the local authority representatives) in all aspects linked to inspections related to an aircraft during the acceptance and delivery phase (Final Assembly Line until Acceptance Flight inspection). Internal regular meetings are organised in order to identify all risks, to suppress danger, to define objectives, methods, means and priorities, and to analyse and control all risks, using all appropriate individual or collective protections.

Airbus in France, for example, provides systematic awareness information to each new customer before entering their aircraft. Driving information, via a small 10 minute video, has been adapted as instructional support regarding the different steps of inspection. At the end of this video information, an individual certificate is completed and signed by each customer authorising them to access the aircraft. This certificate is valid for only one year in order to re-inform customers about new safety regulations. A Safety Rule card is given to each customer in order to identify them around an aircraft and a high visibility jacket (orange colour, with "CUSTOMER" on the back) has to be worn – winter or summer – prior going to the aircraft. Some individual protective gear (including earphones, gloves and goggles) are available close to the aircraft and a summary of key safety rules are posted in strategic areas.



# **CASE STUDY**



# CONTRACTOR SAFETY SYSTEM, AIRBUS IN THE UK

In the UK, Airbus' contractor employees have been inducted into Broughton's Contractor Safety System since its introduction in 2002. Several safety officers monitor the contractors' performance and assess and report non-compliance points. Prior to working on site, all contractors must attend a safety systems induction, after which they receive a passport allowing them to work on the Broughton site. This ensures that all contractors comply with company policy and legal requirements of the Health & Safety Executive and the insurer Lloyds.



# COMMUNITY Involvement

# **NATIONAL SITES' SPONSORING & PARTNERSHIP**

Airbus Central Entity (2007) – The Airbus flight test pilots met ill children at the Toulouse Hospital. They presented a video of the first A380 flight, gave explanations and answered children's questions. During a tea break with the children, they offered and signed aircraft posters and magnets. Other outreach sessions are planned at this hospital.

Airbus in China (2006) – On 20<sup>th</sup> July 2006, HUA-OU TAKE-OFF Psychological Guidance Centre, which is sponsored by Hua Ou Aviation Training and Support Centre, was officially inaugurated at the Beijing Sun Village Children's Education Consulting Centre. The new Psychological Guidance Centre will provide necessary psychological consulting services, with the aim of creating a healthy and sound environment in which to grow up for children whose parents are serving sentences in jail.

Airbus in France (2007) – A partnership with 'Aviation sans Frontières' (Aviation without boarders), provided 50 young disabled people a first flight on the A320 above the Pyrenees Mountains as their Christmas present.

Airbus in Germany — "Aktion Glückspfennig" supports social and charitable projects in the neighbourhoods near Airbus sites. Employees donate the cents portion of their monthly salary, and the company doubles the donation. "Donation managers" at each site meet regularly to select the organisations which will benefit from "Glückspfennig". Since 2000, more than €1.4 million have been given to nearly 400 projects.

Airbus in Japan has donated equipment to "Doctors of the World" Japan in 2006. This organization gives emergency assistance to countries in need, including assistance with devastation endured after an earthquake or other times of crisis or aid to poverty stricken countries.

Airbus in North America has been involved for years in supporting the Ronald McDonald House, an outreach and support programme for families with ill children, also providing children from homeless families with book bags for school each year and ensuring impoverished children receive the Christmas presents they ask for.

Airbus in Spain (2006) – A significant number of volunteers from the Puerto Real and Getafe sites were volunteers participating in the cleaning of the Galice coasts after a fuel disaster (oil spill). Airbus also provided materials and supplies useful in the clean-up efforts.

Airbus in the UK — Airbus' Community Relations programme has developed to reach over 400,000 people. Partnership and sponsorship programmes, such as the Festival of Youth Sports or Flying Start Challenge, along with school liaison and campus management activity enable young people to develop their personal skills and to learn about their environment and eco-efficiency in engineering. Other tools, such as the Horizons local community magazine, help to illustrate these cross-community activities. Massive funds are also raised by over 100 Airbus volunteers in the UK who touch the lives of many people in need.

# **MAKING A DIFFERENCE**

For many years, the aeronautical sector has worked across boundaries to bring people together. Since its creation, Airbus has been present, has contributed to, and has been involved in its local communities and with society at large through the active involvement of its employees.

Each national entity and subsidiary has dealt with charitable, sponsorship and partnership initiatives on an individual basis and had sole responsibility for the selection of these projects/partnerships. Sponsoring and partnership efforts have reflected the very culture found within each entity. However, three common partnership genres surfaced: human health and community services, youth development, and environmental best practice programmes. Listed on the left are a few of the many efforts achieved by Airbus' national sites in recent years.

## TODAY AND BEYOND

Today, despite the challenging economic context that we are facing, Airbus understands the importance of its role as a corporate citizen in supporting and contributing towards the development of its local communities, employees, and society at large, particularly in the three areas (human & health services, youth and environment) common to all parts of the organisation and to Airbus as a whole. As the company moves towards further integration, there is now an opportunity to consolidate its activities worldwide under an umbrella organization at the headquarters level.

With the creation of the Airbus Corporate Foundation in 2008, Airbus aims to integrate the efforts achieved by all Airbus employees involved and to add value to their collective contributions to society, while further uniting Airbus internationally.

# THE AIRBUS CORPORATE FOUNDATION

In its commitment to furthering many years of humanitarian aid efforts, youth development and environmental programmes, the Airbus Corporate Foundation wishes to place itself at the service of people in need and to improve the future for forthcoming generations. Looking towards the future, Airbus is convinced that with employees' involvement, together with the company management's support, more can be done.

The three common themes - environment, humanitarian aid, and youth development - are topics which are intrinsic to Airbus' responsibilities and are fully answering the commitment to strengthening its role as a corporate citizen by tackling issues related to the company's area of activity.

Airbus believes it has a responsibility to encourage youth development projects, enhance knowledge in environmental best practices and to support disadvantaged people.

As a means of playing an active role as a corporate citizen Airbus has committed, in the following ways, to our various stakeholders:

**Employees**, which are involved or interested in the three themes above, could bring projects to the attention of the Airbus Corporate Foundation. They could become champions for the communities or charities the Foundation will partner. Employees will also be able to apply for solidarity leave, to actively participate in the implementary execution of one of the supported projects.

Furthermore, joining efforts with **Customers** or supporting their efforts will not only allow Airbus to extend its reach, benefiting a larger number of causes (something that would otherwise be difficult to achieve on an individual basis), but will also aid in bringing industrial players closer together in trying to find solutions to global issues.

The involvement with **Local Communities** is instrumental to the company's wishes and values. Airbus' role as a corporate citizen, particularly with the communities where it operates, is to help them, alone or with other local partners.

In addition to the above areas, the Corporate Foundation will also support international **NGOs** in their many efforts to alleviate illness and diseases all around the world.

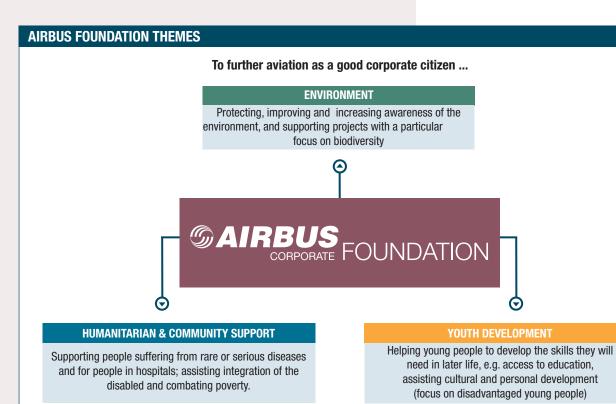


# CASE STUDY

# UNITED FOR NATURE

Airbus is joining forces with the United Nations to support the "Green Wave": a worldwide campaign to educate young people about the crucial role that protecting the diversity of life on earth play in our future.

The Campaign encourages schools around the world to plant trees and to celebrate the international day on biodiversity, at 10am on the 22<sup>nd</sup> of May each year. The main focus of Airbus' involvement is to help raise awareness of the project and the announcement kicked off a worldwide communcations campaign.





Global air transport spurs economic development, enables business and tourism and facilitates social and cultural development worldwide. But to deliver these benefits, challenges such as safety, infrastructure, the environment and an increasing demand for mobility, among others, must be met by the industry. As a global industry leader, Airbus relies on the close relationships it has built with its customers, suppliers and industry partners worldwide to best meet these evolving market challenges.

# AT A GLANCE

Airbus is committed to satisfying its customers by putting safety first and designing and delivering aircraft and services on time, at a reasonable cost and to the highest standards of quality. Although high demand for Airbus products continues, the company is also facing a challenging period of industrial recovery and a weakening dollar that would potentially threaten its competitiveness. As part of essential counter measures to allow Airbus to become stronger, more competitive and responsive to customers, the four-year turnaround programme Power<sup>8</sup> was launched in 2007.

# **KEY 2006-2007 ACHIEVEMENTS**

- 1,458 new firm gross orders in 2007 (p62)
- 453 aircraft deliveries in 2007, including the first delivery of an A380 on October 15th (p62)
- New Customer Order Desk inaugurated in 2007, enhancing the support of airline requests and spares orders (p69)
- Signing of three new industrial co-operation agreements with the Russian United Aircraft Corporation in March 2007 (p65)
- Signing of the joint-venture contract for the Airbus A320 Family Final Assembly Line in Tianjin (p65)

# **AIRBUS' PRIORITIES:**

- Ensure production plans and deliver on quality and promises, while remaining competitive
- Support emerging countries' access to new markets through industrial cooperation
- Help customer airlines improve their profitability by providing eco-efficient, comfortable and lower cost aircraft along with customized services and support
- Strengthen cooperation with supplier base





We can only achieve profitable and sustainable market growth through a truly global industrial and engineering footprint.

Fabrice Brégier, Chief Operating Officer

"



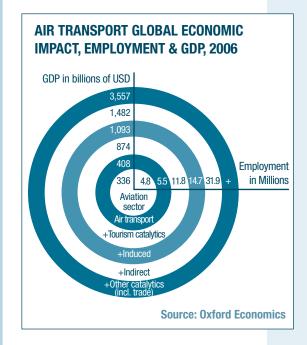
# AIR TRANSPORT Trends



# **KEY FIGURES ON AVIATION CONTRIBUTION**

- 2.2 billion passengers annually
- 7.5% contribution to world GDP
- 32 million jobs globally, including 5.5 million direct jobs
- 35% (by value) of all international trade is transported by air

**Source: Air Transport Action Group** 



# THE INDUSTRY

# **ECONOMIC & SOCIAL BENEFITS OF AIR TRANSPORT\***

According to a recent study from the Air Transport Action Group (ATAG), the air transport industry generated about 5.5 million direct jobs globally in 2006 through airline and airport operations, aircraft manufacturing and maintenance activities, air traffic control and passenger air services (such as check-in, baggage handling, on-site retail and catering facilities).

Adding indirect impacts, such as suppliers to the air transport industry, the overall contribution to global employment and gross domestic product (GDP) is much higher; 6.3 million indirect jobs globally are supported through the purchase of goods and services by the air transport industry. These indirect impacts contributed US\$465 billion to global GDP in 2006. An additional 2.9 million induced jobs are supported through air transport employees' own consumption (using their income to purchase goods and services). Air transport's induced contribution to global GDP is estimated at US\$220 billion for 2006.

Air transport's most important economic contribution comes from its "catalytic benefits", in other words its impacts on the performance and growth of other industries. It has a direct impact on world trade. More than 40% of interregional exports of goods (in value) are transported by air and 25 % of all companies' sales are dependent on air transport.

By facilitating tourism, air transport also has a great impact on economic progress; 40 % of international tourists travel by air, connecting different cultures and nationalities, providing jobs, improving living standards and alleviating poverty. Air travel is becoming more accessible, more affordable and more important to people from all economic backgrounds, particularly in emerging nations like China, India and in Africa. By providing services to remote areas where other transport modes are limited, air transport gives people access to essential services such as hospitals and education, and opens up ways to connect to other communities.

Air transport also improves productivity, encourages investment and innovation, supports business operations and efficiency, and allows companies to attract high quality employees. According to the European cities monitor 2007 (Cushman & Wakefield), 52% of companies consider international transport links to be a key factor when locating businesses in Europe.

Research from Oxford Economics shows that the catalytic impact of air services on investment and productivity has contributed an additional 4% to the European GDP over the past decade.



# TRAFFIC FORECAST\*\*

After two years of stagnation following the events of 2001, air travel made a solid comeback, growing by 14% in 2004, 7% in 2005, 6% in 2006, and 6% for 2007. From 2007-2026, world passenger traffic is expected to increase at an average of 4.9% per annum, and the number of passenger flights offered will more than double. The two areas with the largest traffic flows of the past 20 years, domestic US and intra-Western Europe, will continue to lead for at least the next 20 years. However, the growing impact of Chinese flows is equally clear. China's domestic flow is expected to be the third largest by the end of 2026.

Airbus expects the main drivers of worldwide traffic growth in the coming years to include:

- A new Asian economic paradigm stimulated by a wave of regional consumerism
- · Deregulation in India
- · The continuing high traffic growth rates for domestic China
- The increasing importance of Middle Eastern global hubs
- · Tomorrow's emerging countries and markets

# FLEET EVOLUTION\*\*

The world's fleet, which includes both passenger (from 100 seats to very large aircraft) and freighter aircraft, will grow from 14,980 at the end of 2006 to nearly 33,000 by 2026. In addition, the world's airlines will require more than 6,000 smaller aircraft (with 30 to 100 seats) to serve regional demand, especially in the US and Europe.

At the same time, some 13,772 aircraft from the existing fleet will be replaced by more eco-efficient models. Of these, 4,412 will be recycled back into passenger service, where they too will replace an older generation model for another airline. It is also forecast that 2,901 aircraft will be converted to freighters and the remaining 6,459 will be permanently retired or withdrawn from service, where increasing numbers will be decommissioned through environmentally sensitive programmes, such as the Airbus' end-of-life project (p42).

Overall, this demand will require an average of 1,213 new, eco-efficient aircraft deliveries per year, which - combined with the decommissioning of older generation aircraft - will gradually reduce the average fuel consumption of the world's fleet to less than three litres per 100 seat kilometres, the standard set by the A380 today.

\*Source: The Economic & Social Benefits of Air Transport 2008, ATAG

\*\*Source: Airbus Global Market Forecast 2007



# **CASE STUDY**



# AIR TRANSPORT IN CHINA & INDIA\*\*

China and India are currently changing the face of global economics. In just a few years, China has jumped from being the 7<sup>th</sup> largest world economy to the 3<sup>rd</sup> largest, by 2040 it is expected to regain the premier economic status it held centuries ago. India has recently joined the world's top 10 economies and will no doubt be among the top five by 2026. At the same time, this growth has been accompanied with concerns linked to social development, environment and consumption structures, such as the question of how to balance their booming economies and social progress with environmental protection.

Rapid urbanisation, better jobs in large cities and the absence of a well established country-wide road transportation network have facilitated the fast penetration of air transport into China and India. Air transport has been usurping a greater share from road or rail networks, which still require significant amounts of time and capital to develop fully. This has especially been the case in China and India, due to their relative size and topography. For example, it takes up to 24 hours to travel from Delhi to Mumbai by train, yet it currently takes only 90 minutes to fly. The availability of air transport allows both countries to access foreign investments and knowledge, and helps develop inbound, domestic and outbound tourism.



# AIRBUS' Performance



# BUSINESS ACTIVITIES 2006/2007

	2006	2007
Revenues (€m)	25,190	25,126
Order intake (€m)	53,367	117,323
Order book (€m)	210,115	283,829
New orders (aircraft)	824	1,458
Order backlog (aircraft)	2,533	3,421
Deliveries (aircraft)	434	453
Aircraft in operation	4,365	4,794
Customers (number)	271	287
Suppliers (number)	250	286

Airbus has been fully consolidated with EADS since 2001, giving EADS control over the assets, liabilities and operations of Airbus since that date. BAE Systems held a 20% share in Airbus until October 2006, at which time EADS purchased the share.

For financial information / investor relations see:

www.eads.net/1024/en/investor/ir.htm

# 2006-07 ACTIVITY

Airbus has experienced a record year in terms of sales in 2007, leading to the highest backlog ever. It has improved performance in terms of deliveries in line with a managed production ramp up.

But despite high order intake figures, Airbus faces uncertainties in the aviation market, a fluctuating dollar and industrial challenges such as delays in its A380 programme and the costs of the A350 XWB development, as well as a healthy competitive market environment.

To counter these challenges, Airbus launched a four-year turnaround programme, "Power8", in early 2007 with a goal of building a "new Airbus", a fully integrated company, focused on its core business, with improved processes to produce the most eco-efficient airliners. This is critical to ensure the satisfaction of both customers and shareholders and be ready for the future.

# SALES AND DELIVERIES

Sales have largely been driven by fast growing, emerging markets such as Asia-Pacific, China, India and the Middle East. Overall, 2007 was a record year in terms of sales for the aviation industry, and also for Airbus which won 1,458 firm new gross orders from more than 80 customers, valued at US\$181.1 billion at catalogue prices. During the year, Airbus passed the 8,000<sup>th</sup> order milestone, and the year's unprecedented sales led to a new record backlog for the company, reaching 3,421 aircraft at the end of the year and giving Airbus a 50 per cent share of all aircraft yet to be delivered.

In 2007, Airbus delivered a total of 453 aircraft, compared to 434 in 2006. In December 2007, the number of Airbus aircraft handed over to customers passed a major milestone with the 5000<sup>th</sup> delivery. Airbus also celebrated the delivery and entry into service of the first A380 in October 2007.



## INDUSTRIAL TURN-AROUND

At the beginning of 2007, Airbus launched its comprehensive improvement programme, "Power8", with the objective of turning the company around by completing its integration and making it leaner, more efficient and productive. It will enable Airbus to develop aircraft faster and with the support of strong tier-one suppliers, both in the aerostructure and equipment fields, allowing the company to concentrate on its core business - as aircraft architect and integrator.

Important steps were made in 2007 toward building the "New Airbus", including reducing the former eight, mostly national, Centres of Excellence (CoE) to four fully transnational organisations to reinforce the focus on aircraft architecture and integration.

Procurement also was organised around transnational multifunctional teams. In addition, support functions, such as Human Resources and Finance, were fully centralized for the first time since Airbus' creation.

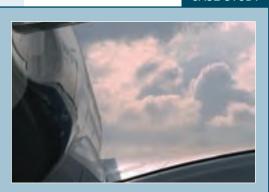
Process and Methods organisations in Engineering and Operations also were created, marking a first step toward enforcing the adoption of common policies, methods and processes to be used across Airbus. This level of harmonisation has also been applied to other areas, such as supply chain, logistics and transport.

After a difficult year in 2006 with the delays of the A380 programme, 2007 marked the beginning of Airbus' industrial recovery. Planned measures have been implemented and are starting to deliver expected results.

Globally, the industrial recovery plan for the A380 is in place. A total of 25 airframes, including the two for the fatigue and static tests and the five flight test aircraft, had been assembled by the end of 2007. A further development milestone achieved in 2007 was the freezing of the new Digital Mock-Up (DMU) design that will be used for aircraft not yet assembled. These are also clear indicators that the recovery measures that have been implemented are delivering the expected results, even if the challenges are not yet fully overcome.



# **CASE STUDY**



# A380 - GETTING INTO SERVICE

To ensure the A380's high level of maturity at entry-intoservice, Airbus carried out extensive worldwide, airport compatibility checks and route proving exercises during 2006 - 2007.

Four A380 test aircraft logged a total of more than 5,000 hours, half dedicated, beyond certification requirements, to maturity development and service readiness verification. Some flights gave A380 customers the opportunity to get hands-on cabin, flight and maintenance experience.

In addition, the early long flights (ELF), conducted in 2006, were an important step towards the A380's entry-into-service. They took place ahead of route proving and allowed Airbus to assess the cabin environment and systems in flight ahead of the final stages of certification. The ELF were operated like standard airline services, with a full cabin crew on board to look after and ensure the safety of passengers. Facilities such as the galley, air-conditioning and crew rest areas were assessed and passengers also had the chance to test features such as the toilets, lighting, acoustics and in-flight entertainment systems.



# INTERNATIONALISATION





# **KEY FIGURES - AIRBUS IN EUROPE \***

- 15 sites
- More than 1,400 Airbus aircraft delivered
- More than 2,200 Airbus aircraft orders
- 61% of total procurement spend



**AIRBUS IN FRANCE (INCLUDING HQ)** 

22,308 employees



**AIRBUS IN GERMANY** 

**2**1,050 employees



**AIRBUS IN SPAIN** 

2,792 employees



AIRBUS IN THE UK

• 9,291 employees

\*All figures at end 2007

# **GLOBAL OUTREACH**

Airbus may have started life with European roots, but it has now transformed itself into a global player. Over time, Airbus has evolved from being concentrated in the four main industrialised nations of Europe, France, Germany, Spain and the UK, to the point where nearly 40% of today's procurement spend is spread among nearly 80 countries, the largest being the US where Airbus spends over €6 billion per year.

Airbus aims to build a global company that creates value for its customers, its shareholders and the many countries around the world where its aircraft are operated. Airbus' internationalisation reaches out from the final assembly lines in Toulouse, Hamburg and Tianjin (opened in 2008) as centres of gravity for all regional activities. The present strong drive towards internationalisation enters into the frame of Airbus' vision for 2020; it is a long-term move that aims at ensuring sustainable success and delivering mutual benefits.

## AIRBUS IN EUROPE

France is home to four Airbus manufacturing sites, final assembly lines and the company's headquarters in Toulouse. The manufacturing sites form the Centres of Excellence for aircraft nose sections, centre fuselages and engine pylons and nacelles. Toulouse undertakes the final assembly of nearly all aircraft types, including the new final assembly line specifically dedicated to the A380.

There are six Airbus sites in **Germany** including the Airbus Deutschland headquarters in Hamburg, which plays a decisive role in the development and engineering of all Airbus aircraft. Final assembly also takes place here for the A318, A319 and A321.

Three Airbus sites in **Spain**, where the horizontal tail planes are built, help make the company an industry leader in the development and use of weight-saving composite materials. In addition, the final assembly line for the A400M is located in Sevilla.

Two Airbus sites in the **United Kingdom** have contributed expertise in the design and manufacturing of aircraft wings since the company's beginnings.



# AIRBUS IN NORTH AMERICA

Airbus facilities in North America, Airbus Americas, provide a full range of activities, from sales and service to design and development. In addition to its headquarters near Washington D.C., the company has six locations in the U.S. where nearly 600 employees serve the needs of every Airbus customer.

The newest Airbus facility in the U.S. – Airbus North America Engineering in Mobile, Alabama, completed in early 2007 – is responsible for the design and engineering of interior elements of Airbus' newest aircraft, the A350 XWB. Airbus spends about 46% of its aircraft-related procurement with suppliers across the United States and Canada. An Airbus procurement team based in North America provides day-to-day working contacts with the region's suppliers, supporting the procurement process that is handled through the central management organisation at Airbus' Toulouse headquarters.

## **AIRBUS IN RUSSIA**

Airbus, one of the first western aerospace companies to develop co-operation agreements with Russia, has a regional office for marketing and communications activities and a customer services office, providing on-the-spot airline support in Moscow. In March 2007, Airbus signed three new agreements with the Russian United Aircraft Corporation (UAC). These agreements offer Russian industry a 5% risk sharing participation in the A350 XWB airframe, establish a joint venture for civil freighter aircraft conversion for the Airbus A320, and make UAC a shareholder in the Engineering Centre Airbus Russia (ECAR), which will further develop its ties with the Russian aerospace industry.

# **AIRBUS IN CHINA**

Airbus in China, which opened its Beijing office in 1990, also has a string of local customer support offices to provide ready assistance to airlines. The Airbus Beijing training centre, a joint effort with China Aviation Supplies Import & Export Corporation, has trained thousands of maintenance engineers, cabin crew and pilots. The nearby Airbus customer support centre stocks some 25,000 spare parts available for dispatch to airlines in the Asia-Pacific region.

The first Airbus final assembly line to operate outside of Europe is located in Tianjin, and officially opened in September 2008. This production site for A320 Family aircraft is a joint venture between Airbus and a Chinese consortium of Tianjin Free Trade Zone (TJFTZ) and China Aviation Industry Corporation (AVIC).



# **KEY FIGURES - AIRBUS IN THE USA \***

- 590 employees
- More than 190,000 US jobs supported
- 6 operational locations
- More than 1,700 Airbus aircraft delivered
- More than 2,400 Airbus aircraft orders
- Several hundred suppliers
  - \*All figures at end 2007



# **KEY FIGURES - AIRBUS IN RUSSIA \***

- Creation of a joint engineering centre, ECAR, in 2003 as the first Airbus engineering facility outside of Europe, today employing more than 170 Russian engineers
- 20 Airbus aircraft delivered
- More than 70 Airbus aircraft orders
- Important materials & titanium supply
  - \*All figures at end 2007



# **KEY FIGURES - AIRBUS IN CHINA \***

- **O** 366 employees
- 2 operational locations
- More than 250 Airbus aircraft delivered
- More than 570 Airbus aircraft orders
- Several suppliers with a purchasing amount of ca. US\$70 million
  - www.airbuschina.com.cn
  - \*All figures at end 2007



# INTERNATIONALISATION



**KEY FIGURES - AIRBUS IN INDIA \*** 

- AECI is aiming at a headcount of about 80 to 90 engineers by end of 2008
- About 100 Airbus aircraft delivered
- More than 300 Airbus aircraft orders
  - \*All figures at end 2007

## AIRBUS IN INDIA

The Airbus Engineering Centre India (AECI) in Bangalore, opened in 2007, is a fully owned subsidiary of Airbus and part of the EADS Technology Centre India, which will become a major employer in the aerospace and defence sector in India, with the potential to create up to 2,000 jobs over the next 15 years. Focusing on high-end engineering analysis and design, AECI is fully integrated into Airbus' global engineering network.

Airbus is also working with Canadian aircraft simulator manufacturer CAE to establish a training centre in India by 2009, able to provide training for up to 1,000 pilots per year.



**KEY FIGURES - AIRBUS IN JAPAN \*** 

- 22 employees
- More than 100 Airbus aircraft delivered
- More than 100 Airbus aircraft orders
- More than 50 supplierswww.airbusjapan.com
  - \*All figures at end 2007

# AIRBUS IN JAPAN

Airbus entered the Japanese market in 1979 when Japan Air Systems (JAS, now merged with Japan Airlines) ordered a fleet of six A300s. Airbus in Japan, based in the heart of Tokyo, is responsible for all local industrial and customer service activities covering industrial partners and operators alike. A number of leading Japanese companies are contributing to the Airbus aircraft families, and it is estimated that A380 programme business could bring more than US\$4 billion to the Japanese industry in the coming years.



KEY FIGURES - AIRBUS IN THE MIDDLE-EAST \*

- More than 260 Airbus aircraft delivered
- More than 690 Airbus aircraft orders
- Material & Logistics Centre Middle East of more than 3,700 m<sup>2</sup> of storage space and office facilities
  - \*All figures at end 2007

# AIRBUS IN THE MIDDLE EAST

The Airbus Middle East subsidiary, headquartered in the Dubai Airport Free Zone, supports the Airbus presence in Gulf Cooperation Council countries (Bahrain, Kuwait, Qatar, Oman, Saudi Arabia, and the United Arab Emirates), as well as Yemen, Egypt, Palestine, Jordan, Syria, Lebanon, Iraq, Iran, Afghanistan, Pakistan, Bangladesh, Sri Lanka and the Maldives. This facility is in charge of all commercial activities for the region, as well as all customer service activities from spare parts to technical support and training.

A training centre, operated jointly with CAE, offers a multifunction training device (MTFD) and full-flight simulators for the A330/A340 and A320. In addition, to support the growing Airbus presence in this area of the world, a material and logistics centre became operational in 2008.



# **CUSTOMER** Satisfaction

# SAFETY

More than half a billion passengers fly in Airbus aircraft each year. They trust the airlines to get them safely to their destinations. In turn airlines and other operators expect Airbus to deliver reliable, high-quality, performing aircraft. At every point in the design, manufacturing and assembly process, Airbus ensures its work complies with the most stringent safety and quality standards.

# SAFETY POLICY

Safety is the number one priority for Airbus in the design, building and performance of its aircraft. There is no compromise on safety.

Through its corporate policy, Airbus is committed to upholding this vision by:

- proactively and continuously addressing all potential issues in all fields that contribute to the safety of air travel: design, manufacturing, operations and maintenance
- proactively contributing to the industry-wide effort in all the above-mentioned fields with the aim of enhancing the safety of air travel at all stages in the air transport system
- further reinforcing its safety culture, which is one of Airbus' fundamental assets

Airbus believes that safety is not a matter of competition; cooperation with air safety organisations around the world and participation to collaborative safety-related activities to find new ways of improving standards for everyone is essential.

When applying new technologies or even certifying a new product, Airbus applies the most stringent standards, always meeting, and often exceeding, the certification requirements of the two majors certification authorities, the European Aviation Safety Agency (EASA) and the American Federal Aviation Authority (FAA).

Airbus expects the same stringent quality and safety standards from its suppliers, and these are important criteria in the supplier selection process. Airbus also has very restricted lists of approved part suppliers and repair stations, made available to customers in order to ensure they always get the right and approved parts, and can work with fully compliant repair stations. A product safety process has been implemented across the entire organisation that proactively manages all safety-related activities. To achieve this, Airbus has appointed an Chief Product Safety Officer who oversees this process and reports direcly to the Airbus president and CEO.



# CASE STUDY



# **AirFASE**

Airbus not only designs and builds aircraft: it assists customers in their daily operations with tools such as AirFASE (Aircraft Flight Analysis and Safety Explorer), a software that Airbus co-developed in association with Teledyne. Designed to translate aircraft data into meaningful information, it enables operators to evaluate flight operations trends, identify risk precursors, and take early preventive and corrective actions. AirFASE is part of a comprehensive safety programme developed in conjunction with operators, pilots and world safety institutions.



# **CUSTOMER** Satisfaction



## THE AIRBUS QUALITY VISION

"Demonstrate to our customers, and throughout the industry, our leadership in the quality of our products, services and processes, and the commitment of our people."

## CASE STUDY



# Quality is key for Airbus

The latest Quality Management Forum (October 2008 in Toulouse) brought together over 150 quality managers from all Airbus sites and functions. Most of the Executive Committee members also attended, emphasising in their speeches how crucial quality is to the company.

Over 5,000 people currently work in quality. Their fields of competence range from concept to in-service support, and they are present all the way along the aircraft lifecycle. The forum was designed to stress that quality can and has to strongly impact the sustainable changes needed to achieve Airbus' transition into a much leaner, cost effective and customer-orientated company. Didier Lux, Head of Quality, strongly supported this. Quality functions have an essential role to play in delivering safe and efficient aircraft in record time, and should initiate innovative ways of working as well as supporting ongoing improvements. But the overall quality of its aircraft is also one of Airbus' major assets and should be promoted at all levels.

# **QUALITY**

Airbus' customers expect the highest standard of quality in the aircraft they buy. Safety, reliability, comfort and maintenance costs are thus key areas where quality is crucial in an airline's judgment of an aircraft. Quality is addressed by Airbus at every stage, from design to final assembly and beyond. Delivering aircraft on time, on cost and on quality – getting it right first time – is the goal Airbus continually strives for. The recognition of the quality of our products is one of Airbus' greatest assets.

# THE AIRBUS QUALITY POLICY (TOM ENDERS, JANUARY 2008)

The Airbus commitment to "quality in everything we do", across the entire range of work activities, underpins the company's successes and continues to strengthen its reputation for excellence in commercial aircraft and services. Whilst retaining and building on this reputation, the constant challenge is to continuously improve and to set and achieve new standards for the future. Individual and collective commitment to quality means that Airbus:

- Provides its customers with excellent products and services and continuously takes action to improve their satisfaction
- Works untiringly to improve safety in the aircraft industry collaborating with its customers, partners, suppliers and the Aviation Authorities
- Continuously monitors and improves the motivation, skills and competencies of its multi-national team, building upon their strengths and diversity, encouraging innovation and personal initiative
- Continuously improves trans-national integration and work within its teams
- Continuously improves its processes throughout the business units, integrating environment and quality
- Ensures at all levels that the approvals held within the scope of its activities are maintained at the highest level
- Works in compliance with its certified quality management system
- Continuously improves the cost efficiency and value consciousness of everyone in the company, enabling Airbus to improve the products and services it provides



# **CUSTOMER SERVICES**

Airbus strives to best contribute to its customers' business objectives with support and services that increase aircraft availability, reduce operating costs and enhance quality of operations at the highest possible level of safety. By reinforcing interfaces with customers, and optimizing processes and service offers, Airbus anticipates and adapts to evolving expectations in order to continuously improve customer satisfaction.

## **DEDICATED TEAMS**

Airbus anticipates market needs through teams with specialist knowledge of customers and a consultancy service aimed at helping airlines on issues of safety, cost efficiency and fleet management.

Airbus provides support tailored to each customer, assigning a personal contact, from the initial sales campaign until the aircraft is no longer operated by the airline. A team of more than 3,000 people cover all areas of support from technical and spare parts, to crew and personnel training and aircraft upgrades. And when an aircraft enters into service, Airbus locates a team of resident engineers at the customer's main base, or at more remote locations if necessary, along with a spares engineer who provides support during this initial period. Additional support comes from dedicated teams in Toulouse, Washington and Beijing, including 24-hour, 365-day-a-year access to technical help in Toulouse.

## INNOVATIVE SERVICES & TAILORED SUPPORT

In 2007, new services were added to the Air+ by Airbus portfolio, like FHS-TSP (Flight Hour Services – Tailored Support Package). Airbus FHS suite provides full component support, fleet management, and line and base maintenance. This enables airlines to benefit from the experience and expertise offered by Airbus and its partners in the areas of maintenance, engineering, reliability and supply chain management. In addition, the FHS-TSP offers a predictable cost structure to customers. It helps them meet their business objectives by increasing fleet availability and reducing operating costs.

# **CASE STUDY**

# Monitoring aircraft with AIRMAN

AIRMAN is Airbus' real-time health monitoring software tool that enables operators to optimise line maintenance and troubleshooting of their aircraft. The operational benefits are significant savings in maintenance and operations as delays and cancellations can be avoided, leading to improved aircraft dispatch reliability. Selected by more than 80 airlines, AIRMAN currently monitors over 2,300 aircraft worldwide.



# **KEY FIGURES - CUSTOMER SERVICE**

- 4,794 Airbus aircraft in operation (2007)
- **286** operators (2007)
- 3 customer support centres, 4 training centres, 4 material & logistics centres, 3 warehouses
- More than 250 resident customer support representatives

# **CASE STUDY**



# AIRTAC – **Ai**rbus **T**echnical **A**ircraft-on-ground **C**entre

Located in Toulouse, AIRTAC, Airbus' 365-day a year, 24-hour centre for aircraft-on-ground (AOG) technical queries, started its operations in 2003. The aim of the AIRTAC team is to minimise on-the-ground-time for aircraft for trouble shooting and repairs. On-site technical help comes from resident customer support managers based in many locations around the world, backed up by further dedicated support from teams based in Europe. The AIRTAC centre, which works closely with the Spares Support Customer Order Desk based in Hamburg, has been designed to incorporate a growing number of engineers required to cope with the increasing workload linked to the Airbus fleet growth.



## **CUSTOMER** Satisfaction

#### Air+ by Airbus



Airbus helps customers ensure that the maintenance of their aircraft is as effective and cost-efficient as possible, leading to the greatest operational reliability achievable. Among the engineering services provided by Airbus is AIRTAC, a 365-day a year, 24-hour centre in Toulouse, where specialist engineers are always available to help get aircraft operational again. On-site technical help comes from resident customer support managers based in many locations around the world, backed up by further dedicated support from teams based in Toulouse, Washington and Beijing. A Maintenance Repair & Overhaul (MRO) network has been created by Airbus to propose competitive, quality maintenance services to its customers worldwide. It focuses on adding new and enhanced services to the Airbus offer. Thanks to this network, Airbus is in a position to propose maintenance support packages to customers based on the MRO members' proposals.



The main spares store is located in Hamburg, with a network of centres in Frankfurt, Singapore, Beijing and near Washington D.C. Airbus provides full spare parts data, on-site spares help and provisioning support to operators, as well as offering 24-hour a day order desk services for all their maintenance and repair needs. Airbus provides lease/exchange/repair services, including a guaranteed repair time, and offers same-day spares delivery, or just-in-time delivery through its Customised Lead Time system, which allows customers to specify availability of a wide range of parts and benefit from reduced inventory costs. Through its Customised Spares Logistics service, Airbus offers to reduce the time it takes airlines to get spares, by taking full responsibility for the supply chain.



Airbus Customer Services Training Centres provides operators with a wide range of training courses for pilots, flight attendants, maintenance staff and performance engineers, using innovative courseware, top level instructors and the most advanced training technologies available. These courses are provided through Airbus' training centres in Toulouse, Miami, Hamburg and Beijing.

Furthermore, the Airbus Maintenance Training Network has been launched to give Airbus' operators access to aircraft maintenance training courses close to their base. The training courses are based on a new generation of training tools and methods and are to the same standards as delivered by any Airbus training centre.

#### **CASE STUDY**

#### A FAIR way to work with customers

Available to all airlines on AirbuslWorld, the 'Forum with Airlines for Interactive Resolution' (FAIR) is a web-based tool to improve customer satisfaction and Airbus' processes and organisation. Launched in 2005, the goal was to establish web-based forums to allow the airline and Airbus community to openly exchange their experience and expectations in the various domains of customer support and services. FAIR allows the establishment of joint decision-making processes that use the forum inputs to define the required go-forward plans. By identifying the top fleet issues needing urgent attention and providing customers with the most appropriate solution as quickly as possible, FAIR benefits customers by making issues visible to a wide audience. The first module developed and tested in a pilot phase in 2006 is FAIR-ISP (in-Service problems), a worldwide deployment was launched in December 2006. FAIR will also be used for the first time on the design phase of an Airbus aircraft, the A350 XWB, for customer input.

To provide operators around the world with easy access to the latest information and to help them reduce their operating and maintenance costs, Airbus offers a fully personalised internet-based support environment. AirbusWorld, a secure portal (for more information see: www.airbusworld.com) gives access to a comprehensive selection of tools that includes technical documentation, mechanical drawings, warranty claims on-line, and e-training, as well as an on-line forum for collaboration between airlines and Airbus on in-service aircraft problem identification.

#### **CUSTOMERS FIRST**

In a very competitive environment, airlines expect solutions that contribute to their business objectives and are adapted to their specific needs. One of the more recently defined modules of the Power<sup>8</sup> initiative is "Customers First," an organisation evolution introduced in October 2006 that charges everyone at Airbus with being involved in customer satisfaction.



Customers First is a platform of ten projects matched to customer expectations and to help airlines find the right solutions to fit their outsourcing policies and consider their financial constraints in new aircraft acquisitions; airline economics to help airlines restore their financial margins to compensate for higher fuel prices and other tax increases; and improving cabins by introducing innovation and more efficient upgrades. Other areas covered by Customers First include better integration of the information systems of the aircraft, airline and Airbus, as well as solutions for ageing aircraft.

#### CONTINUOUS TWO-WAY CUSTOMER DIALOGUE

On top of regular contacts with its customers, Airbus periodically organises large forums (symposia, seminars, users clubs, etc.) that gather all operators of a same Airbus family of aircraft or airline staff of a same field of activity, e.g.: training, spares & logistics, warranty, flight operations, etc.

The main purpose of these events is to share in-service experience, propose solutions and favour sharing best practices in total transparency. The feedback gathered enables Airbus to align its priorities to its customers' needs.

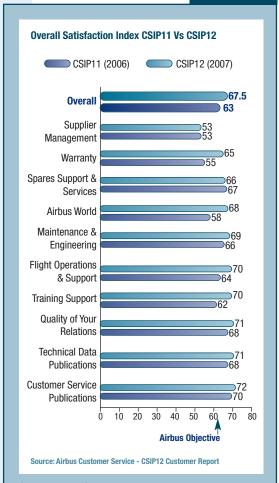
#### SUPPLIER SUPPORT RATING

Airbus has established a system of ranking their first level suppliers and recognises its top performing suppliers in an annual supplier support rating. The rating identifies suppliers' performance and gauges their commitment to customer satisfaction. Each year, through direct customer feedback and suppliers own metrics, areas for improvement are identified where suppliers can then improve their support performance, ultimately helping customers to achieve the best performance for their Airbus aircraft. Each customer also now receives a customised feedback on their inputs. The process allows Airbus to gauge customer expectations and then identify trends, positive or negative, and drive improvement plans to facilitate the enhancement of the support from the suppliers to our customers.

#### **CUSTOMER SURVEYS**

Airbus values its customers' experience, and not only uses their feedback to continually improve the design, production and support of its aircraft, but also to improve its level of customer service. Our customers are acknowledging that Airbus customer services are heading in the right direction.

#### CASE STUDY



### Customer Satisfaction Improvement Programme (CSIP)

The Customer Satisfaction survey, the so-called CSIP, in place since 1997, has been enhanced over the years. Thanks to its customers' feedback, the CSIP enables Airbus to launch actions and identify key areas of improvement in line with inputs by each customer. Following the survey, an in-depth analysis is done through internal workshops to understand the results. Full details of the analysis is then communicated to all customers, including detailed reviews to ensure that actions are taken to address particular customer concerns.

In 2007, a total of 114 airlines were included in the CSIP12 survey, with 107 customers participating (participation rate of 94%). A further 739 questionnaires were completed from 1868 contacts (individual response rate of 40%). The results, published in December 2007, are encouraging and show that we improved compared to CSIP11 in 2006. The global satisfaction index climbed to 67.5 points, 4 points higher than the previous survey.

Moving away from paper, the 2008 CSIP13 exercise has now been carried out as a fully web-based, interactive survey, covering all areas of customer services. Results will be available beginning of 2009.



# PASSENGERS in Mind



### **CABIN VISION**

The comfort and well-being of air travellers depend not only on the spaciousness of the cabin, ergonomics of the seats or the variety of in-flight entertainment, but also on cabin air and reduced cabin noise. Airbus' vision for cabin comfort, efficiency and services builds on experience from existing Airbus programmes, such as the A380, which has set new strong, standards in comfort, and represents the quietest cabin in the market.

#### CABIN AIR QUALITY

One major factor in cabin comfort is invisible: the cabin air. Airbus has developed aircraft ventilation and air purification systems that optimise the air for a jetliner's cabin to provide passengers with clean, fresh air.

#### **FOCUS**

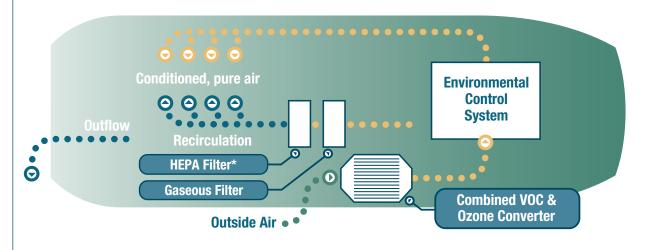
#### **Cabin Air Quality**

Optimal conditioning of the air to the best temperature, pressure, humidity and cleanliness is essential for a healthy and pleasant stay on board, especially on long-haul flights.

Airbus aircraft feature Air Management, which adjusts the amount of outside air supplied based on the number of passengers aboard. Each passenger is supplied with more than 80 times the basic requirement of air per minute for a seated person. The permanent airflow into the cabin creates a rapid air exchange. Computer-designed ventilation patterns ensure that this happens without creating the perception of draught.

On the ground, Airbus' unique Volatile Organic Compounds (VOC) converter keeps cabin air free of kerosene odours from other aircraft. On an A380, the air in the entire cabin is refreshed every three minutes and combined with high-efficiency filters, which remove 99.9 per cent of unwanted substances, delivering the highest air quality on board any aircraft.

Even at the extremely cold temperatures outside the aircraft in flight, which can fall well below -50 °C, the temperature in the cabin is maintained at comfortable levels of around 23 °C. The cabin temperature can be fine-tuned individually in each of up to 15 temperature zones of the cabin. Airbus also offers humidification systems for cabin zones to increase the humidity when needed.







### COMFORT FOR PASSENGERS, FLEXIBILITY FOR AIRLINES

Airbus recently introduced a brand-new cabin for its A320 Family that creates an overall feeling of increased space and light in a noticeably quieter environment. Taking full advantage of the A320's wide fuselage on the single aisle market, the enhanced cabin offers passengers 15% more useable overhead storage. New sculptured sidewall panels provide more space for passengers, while improved sound insulation and other refinements have reduced interior noise levels. A320 operators can choose the cabin product that fits their market from a wider 18-inch seat for improved comfort to a 25-inch aisle for faster boarding and deplaning.

Across the A330/A340 Family, all First and Business Class passengers are guaranteed to have their preferred window or aisle seats, while in Economy Class the seating layout ensures that no passenger is more than one seat from the aisle.

The A380 offers unprecedented levels of floor space, benefiting all classes, especially Economy passengers who gain a one-inch wider seat on both upper and main decks. In Business, the full-flat seat is becoming the new standard thanks to the freedom in cabin layout design offered by the A380.

The A350 XWB cabin will offer the best long-haul comfort for all passengers. It has the widest cross-section of any aircraft in its category, offering airlines the possibility to introduce innovative cabin concepts in all classes. The A350 XWB will feature wider seats and aisles and with straight sidewalls, offering more head and shoulder clearance.

Additional passenger comfort can be achieved with ambient lighting, now available on all Airbus aircraft. Cabin crew can utilise pre-defined lighting patterns to help fight jet lag, including a simulated sunrise to gently wake-up passengers before breakfast, or a sunset transition to ease passengers to rest.

#### CABIN NOISE

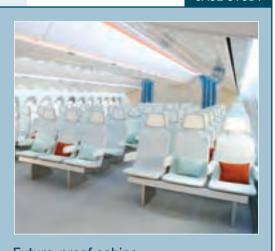
Airbus cabins are the quietest cabins in the sky. The A380 cabin is outstandingly quiet, with a sound level that is five decibels lower than its main competitor (three decibels equates to halving the sound energy).

#### IN-FLIGHT CONNECTIVITY

Airbus has developed an aircraft connectivity platform that is a generation ahead. Passengers may use common communications' devices such as mobile telephones, laptop computers, Personal Digital Assistants (PDA) or blackberry-type phones to send and receive audio calls, SMS messages, emails and access the Internet. Operators can elect to restrict cell-phone usage to data services only (SMS, email).



#### CASE STUDY



#### Future-proof cabins

To anticipate the evolution of the minds of future customers, Airbus doesn't use a crystal ball, it counts on the detailed research of its TrendMonitor teams, which focus on changing trends for cabin design. A cabin's lifecycle is six to ten years making it critical that it will meet customers' future requirements.

Therefore, Airbus studies macro trends in four areas:

- Society and demographics
- . Mobility and transportation on the ground
- Technology and electronics
- Consumption and lifestyle

The TrendMonitor teams filter the most important information and then study it on a second level, in view of customers – both airlines and passengers. During that process, they consider three cabin value drivers – comfort, service and efficiency – to communicate the trends in transfer workshops with their peers. Once identified, the future trends are then matched with potential products and innovation.



## SUPPLIER Relations



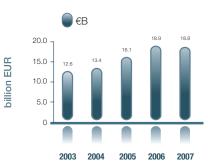
#### **KEY PROCUREMENT INDICATORS**

Procurement Spend (2007): €18.8b

**Procurement spend by regions (2007):** 

		<b>%</b> *
0	European Union (EU)	60.8%
O	North America	34.4%
0	Asia & Pacific	0.9%
O	Central & Eastern Europe	0.5%
0	Rest of World	3.4%

#### PROCUREMENT SPEND PROGRESSION\*



### STRENGTHENING LINKS

Aircraft are highly complex products comprised of thousands of components. Airbus relies on industrial cooperation and partnerships with major companies around the world - a network of 1,500 major suppliers in some 30 countries - to supply its components. Due to this extensive network, it is essential to coordinate activities across the entire supply chain in order to ensure delivery of all purchased goods on time, at cost and to the highest quality standards.

#### SUPPLY CHAIN MANAGEMENT

To meet the required cost, time and quality standards, the Procurement department implements policies and processes across the supply chain. This enables the Procurement team to better manage supplier relations, monitor performance and drive corrective or improvement actions.

#### SUPPLIER DIALOGUE

Airbus is aware that transparency is paramount to better managing the entire supply chain, as well as key to maintaining a strong relationship with suppliers. Airbus provides conventional methods of communication such as conferences, as well as the necessary tools to conduct vital business in the quickest, most effective and streamlined way possible.

- Airbus hosts regular meetings with its worldwide supplier community, providing the opportunity to discuss common issues and future planning.
- In addition, occasional 'virtual meetings' are organized using web-based technology in order to brief suppliers on specific issues and enable real time feedback.
- Airbus also ensures that the support services provided to its customers by original equipment suppliers meet the required standards. For instance, a supplier performance rating is published each year and necessary actions defined to improve the overall results.
- AirbusSupply, the supplier portal on the Internet, provides suppliers with the latest Airbus news, projects, tools and applications. As the privileged point of entry for suppliers, it enables them to manage their performance, exchange product information and spot opportunities quickly- to keep improving quality, which is key to continuing customer satisfaction.



### INDUSTRIAL COOPERATION: A NEW WAY OF WORKING TOGETHER

In a fast changing environment filled with many challenges, the strategic importance of the supply base is increasing. Airbus wants to develop its approach together with its strategic partners, moving towards larger work packages, risk sharing based development and a joint rationalization of the supply chain. Airbus wants to transform its ways of working by listening to its suppliers and effectively implementing joint actions into its daily processes, thereby changing its relationship from a directive mode to a collaborative one, with the clear purpose of achieving tangible benefits.

A concrete example of working more closely with suppliers is the Supplier Council initiative launched in 2006. Focussing on specific topics, Airbus and representatives from major suppliers form project teams to understand current issues and to define improvement actions.

In the frame of the New Systems Policy (NSP), Airbus and suppliers will now also combine forces much earlier in the aircraft development process in order to reduce lead times, increase maturity and keep costs on target. In the past, Airbus used to develop both the functional and technical specifications (what we want the system to do and how it will do it) and then invited suppliers to bid. Now, using NSP, Airbus develops the functional specifications and then works with potential suppliers, using their expertise, to develop the technical specification. The selection process then identifies a supplier to finalise the design and supply the product. Suppliers are expected to propose several viable alternatives during the supplier selection phase, which will then be assessed against a number of criteria - performance, operability, maintainability, lead time and cost. This approach will help ensure selection of optimal design solutions for the aircraft.





Supplier councils are an excellent initiative and a good opportunity to improve our performance and address key issues. A truly collaborative approach will continue to further develop our working relationship.

Klaus Richter Executive Vice President, Procurement



#### **CASE STUDY**

#### **Documentation Reduction Initiative**

A team of major equipment suppliers was established in 2007 as a supplier council project with the objective of reducing the global effort by suppliers and Airbus on contractual development documentation. Among several agreed improvement ideas, it was planned to tailor documentation detail in line with the experience of the supplier and the complexity of the product. In addition, many documents were identified as only being required by suppliers "upon request". After a pilot initiative on A400M development, it has been deployed on A350 XWB and is expected to reduce the volume of documentation by up to 40%.



# DATA Tables

ENVIRONMENT	EFFICIENC	Y								2007 BREAKDOWN PER ENTITY +			
INDICATOR													
			MWh	1,616,589	1,686,101	1,801,034	1,852,675	1,929,752	795,829	579,289	101,143	453,490	
	EN3	lotal energy consumption	MWh/seat	28.34	27.59	26.21	05         2006         2007         FR*         GE           01,034         1,852,675         1,929,752         795,829         579,289           21         23.46         23.17         9.55         6.95           5,261         815,828         849,967         359,838         271,223           14         10.33         10.20         4.32         3.26           5,001         983,839         1,022,146         420,325         307,153           49         12.46         12.27         5.05         3.69           661         53,009         57,410         15,653         914           8         0.67         0.69         0.19         0.01           ,841         218,152         219,805         86,290         62,237           8         2.76         2.64         1.04         0.75           90         3,124         1,345         461         526           4         0.04         0.02         0.008         0.006           179         164         58         43           3         2.27         1.97         0.70         0.51           3         1.75         0.39         0.03	1.21	5.44				
	ENIA	Floatsisite assessmentias	MWh	640,940	715,639	765,261	815,828	849,967	359,838	271,223	64,074	154,832	
ENEDOV	EN4	Electricity consumption	MWh/seat	11.24	12.55	11.14	10.33	10.20	4.32	3.26	0.77	1.86	
ENERGY	ENIO	Con consumption	MWh	940,043	933,955	996,001	983,839	1,022,146	420,325	307,153	22,351	272,317	
	ENS	Gas consumption	MWh/seat	16.48	16.38	14.49	12.46	12.27	5.05	3.69	0.27	3.27	
	ENIO	Fuel oil consumption	MWh	35,598	37,484	39,661	53,009	57,410	15,653	914	14,500	26,342	
	ENS	ruei oli consumption	MWh/seat	0.62	0.66	0.58	0.67	0.69	0.19	0.01	0.17	0.32	
	EN16	Total direct CO <sub>2</sub> emissions	tonne	199,606	192,245	211,841	218,152	219,805	86,290	62,237	8,545	62,733	
EN10 from fossil fuel combust  EN20 Total VOC emissions  EN20 NOx emissions  EN20 SOx emissions  EN20 Sox emissions  EN20 Total annual water consumption  EN21 Total annual water disch  EN22 Total amount of waste  Total amount of non-	from fossil fuel combustion**	tonne/seat	3.50	3.37	3.08	2.76	2.64	1.04	0.75	0.10	0.75		
	EN3         Gas consumption         MWh         940,043         933,955         996,001         983,839         1,022,146         420,325         307, 307           EN3         Fuel oil consumption         MWh         35,598         37,484         39,661         53,009         57,410         15,653         914           EN16         Total direct CO2 emissions from fossil fuel combustion**         tonne         199,606         192,245         211,841         218,152         219,805         86,290         62,2           EN20         Total VOC emissions         tonne         2,170         2,626         2,690         3,124         1,345         461         526           EN20         NOx emissions         tonne         249         273         291         179         164         58         43           EN20         SOx emissions         tonne         126         131         140         186         145         32         2           EN20         Sox emissions         m3         1,772,284         1,840,194         1,810,090         2,062,058         1,961,038         725,204         669,           EN8         Total annual water consumption         m3         533,314         458,190         470,434         457	526	100	258									
EMISSIONS	LINZU	iotai voo eiiiissioiis	tonne/seat	0.04	0.05	0.04	0.04	0.02	0.008	0.006	307,153         22,351           3.69         0.27           914         14,500           0.01         0.17           62,237         8,545           0.75         0.10           526         100           0.006         0.001           43         9           0.51         0.11           2         26           0.03         0.31           669,299         167,701           8.03         2.01           133,860         167,701           1.61         2.01	0.003	
LIVIIOGIUNG	ENOO	NOv omissions	tonne	249	273	291	179	164	58	43	9	53	
	LINZU	NOX CITISSIONS	kg/seat	4.37	4.79	4.23	2.27	1.97	0.70	0.51	0.11	0.64	
	ENOO	COv amissions	tonne	126	131	140	186	145	32	2	26	85	
	LINZU	SOX CITIESTOTIS	kg/seat	2.20	2.30	2.04	2.35	1.75	0.39	0.03	0.31	1.02	
	ENIQ		m3	1,772,284	1,840,194	1,810,090	2,062,058	1,961,038	725,204	669,299	167,701	398,834	
WATER	LIVO	consumption	m3/seat	31.07	32.26	26.34	26.11	23.54	8.71	8.03	2.01	4.79	
WAILII	FN21	Total annual water discharge	m3	533,314	458,190	470,434	457,290	441,633	62,299	133,860	167,701	77,773	
	LIVZI	iotal allitual water discharge	m3/seat	9.35	8.03	6.85	5.79	5.30	0.75	1.61	2.01	0.93	
WASTE	EN22	2 Total amount of waste	tonne	61,219	68,812	76,571	81,125	70,368	38,898	21,374	1,700	8,396	
			tonne/seat	1.07	1.21	1.11			0.47		0.02	0.10	
	FN22	Total amount of non- hazardous waste produced	tonne	34,355	44,867	49,090	52,533	44,284		16,798	1,226	6,149	
	LIVEL		tonne/seat	0.60	0.79	0.71	0.67	0.53	0.24	0.20	0.01	0.07	
	EN4         Electricity consumption         MWh/seat         11.24         12.55         11           EN3         Gas consumption         MWh         940,043         933,955         98           MWh         940,043         933,955         98           MWh/seat         16.48         16.38         14           EN3         Fuel oil consumption         MWh/seat         0.62         0.66         0.           EN16         Total direct CO2 emissions from fossil fuel combustion**         tonne         199,606         192,245         21           EN20         Total VOC emissions         tonne         2,170         2,626         2,           EN20         NOx emissions         tonne         249         273         25           kg/seat         4.37         4.79         4.           EN20         SOx emissions         tonne         126         131         14           kg/seat         2.20         2.30         2.           EN2         Total annual water consumption         m3         1,772,284         1,840,194         1,           EN21         Total annual water discharge         m3         533,314         458,190         47           EN21         Total amoun	27,482	28,592		-,		474	2,877					
	LIVEZ	waste produced	tonne/seat	0.47	0.42	0.40	0.36	0.32	0.23	0.05	0.01	0.03	

<sup>\*</sup> Airbus Headquarters in France: ENV indicators are consolidated in FR 

\* Entity Key: FR = France 

GE = Germany 

SP = Spain 

UK = United Kingdom 

\*\*Concerning direct GHG emissions, only combustion of natural gas and heating fuel is reported. GHG emissions due to intersite transportation of aircraft elements or from cooling systems are not included.

SOCIAL PRACTIC	E								2007 BREAKDOWN PER ENTITY					
INDICATOR													CE (HQ) *	
WORKFORCE	LA1	Total employees	heads	49,520	51,959	54,721	57,043	56,127	17,346	21,050	2,792	9,291	5,648	
	LA1	Breakdown per status: Bluecollar workers	heads	16,411	19,212	19,898	24,937	24,832						
	LA1	Breakdown per status: Administrative & management	heads	32,784	32,115	34,232	32,106	31,295						
	LA13	Percentage of women	%	12.0%	12.0%	12.6%	14.8%	14.8%	14.5%	14.2%	14.8%	7.6%	36.5%	
	LA13	Average age of employees	years	40.6	40.6	41.0	40.6	41.0	38.9	41.4	42.0	42.6	43.1	
		External hiring	heads	4,569	3,641	4,428	4,693	1,389	443	577	72	191	106	
		Temporary workforce	heads		7,850	11,193	10,930	10,605	512	7,323	9	2,618	143	
		EHS training hours	hours	110,313	133,957	130,957	128,000	125,769	44,598	55,421	2,664	18,484	4,602	
		Training investment	€M	25.13	33.08	37.51	47.08	44.01	5.90	16.37	0.90	8.26	12.58	
	LA7	Reportable accidents**	no.	752	718	722	653	682	258	219	49	149	7	
HEALTH & SAFETY	LN	incl. fatal accidents	no.	0	0	1	0	0	0	0	0	0	0	
	LA7	Incidence rate	no.***	14.0	13.2	12.6	10.6	11.2	14.5	9.8	16.4	11.9	1.4	
	LA7	Days lost for accidents > 3 days	no.	12,739	12,163	10,518	8,188	9,684	4,710	2,425	972	1,466	111	
	LA7	Severity rate	no.****	24.9	23.6	18.3	13.3	15.9	26.4	10.8	32.5	11.7	2.2	

<sup>\*\*</sup> Work-related accidents with > 3 days absence \*\*\* = Reportable accidents x 1000 / workforce \*\*\*\* = Days lost x 100 / workforce \*\* Entity Key: FR = France GE = Germany SP = Spain UK = United Kingdom \* CE = Central Entity, Airbus Headquarters in France (Total employees figure includes overseas subsidiaries)

ECONOMIC PERFORMANCE											2007 SPLIT BY REGIONS (in %)+					
INDICATOR												CEE				
COMMERCIAL	EC1	Turnover	€B	19.3	20.2	22.2	25.2	25.2								
		Orders	aircraft	283	370	1111	824	1458								
		Deliveries	aircraft	305	320	378	434	453								
PROCUREMENT		Procurement spend*	€B	12.6	13.4	16.1	18.9	18.8	60.8	34.4	0.9	0.5	3.4			

# SCOPE & Methodology

#### REPORTING SCOPE

The data published in this report covers the activities of Airbus' 15 sites in France, Germany, Spain and the United Kingdom. Head offices, spares centres, training centres and overseas facilities (including customer services representatives) are not included in the environmental reporting scope.

#### REPORTING PERIOD

Airbus publishes its environmental, social and economic report every two years. Our previous report, covering the period 2004 and 2005, was published in 2006. This report mainly presents key achievements which occurred between 2006 and 2007, and also outlines key activities in 2008. Reporting on indicators with quantitative data for 2008 will be carried out in the next report.

#### CHOICE OF ENVIRONMENTAL, SOCIAL AND ECONOMIC INDICATORS

Airbus chose environmental indicators that enable it to track the flows associated with its activities and performance against the commitments made in the Site and Product Oriented Environmental Management System (SPOEMS). They also track performance on major issues such as the impact of greenhouse gases (GHG) and other atmospheric pollutants, water discharges and waste management.

Similarly, social and economic indicators were chosen to illustrate Airbus' key issues and priorities in terms of the company's performance linked to commercial and workforce-related topics.

#### ENVIRONMENTAL REPORTING PRINCIPLES AND METHODOLOGY

To ensure the reliability of its environmental reporting process, Airbus has prepared specific reporting procedures outlined in two main documents, established in accordance with applicable international standards such as the GRI:

- AP2194, describing the reporting principles
- AM2353, defining Airbus' key environmental indicators and specifying guidelines for the calculation of these indicators

In the framework of the implementation of the Site and Product Oriented Environmental Management System (SPOEMS) and a continuous improvement process, Airbus is currently working on an update of its procedures in order to implement an eco-efficiency methodology. A roadmap has been developed and eco-efficiency criteria have been defined and will be tested on a selected number of cases before application throughout the company.

#### LIMITATION

In relation to direct GHG emissions, only combustion of natural gas and heating fuel are reported. GHG emissions due to inter-site transportation of aircraft elements (mainly kerosene for the A300-600 super transporter and gas oil for vehicles), or from cooling systems (cryogenic gases) are measured and followed up, but not included in the data table.

#### ORGANISATION FOR DATA COLLECTION AND CONSOLIDATION

Environmental co-ordinators are in charge of the reporting process at plant level (sites). Indicators are controlled and collected by the sites and consolidated across the company by Airbus' Sustainable Development & Eco-Efficiency department. Since 2005, Airbus uses a computer-based reporting environmental reporting tool (ERT) to collect and analyse environmental data at manufacturing sites on a bi-annual basis. It allows consistent reporting and measurement across Airbus.

#### VERIFICATION

As part of our commitment to providing reliable information on our performance, we have asked DNV to review the reporting procedures and data for a selection of key environmental performance indicators published in this report. The nature of the work performed and the results of the verification are presented on the following page.

## **ASSURANCE** Statement



#### Introduction

Det Norske Veritas Certification France S.A.R.L. ('DNV') has been commissioned by the management of Airbus S.A.S. ('the Company') to carry out an assurance engagement on the environmental indicators in the Company's 2007 Environment, Social and Economic Report ('the Report') against the Global Reporting Initiative (GRI) G3 Sustainability Reporting Guidelines.

Airbus S.A.S. is responsible for the collection, analysis, aggregation and presentation of information within the Report. Our responsibility in performing this work is to the management of Airbus only and in accordance with terms of reference agreed with the Company. The assurance engagement is based on the assumption that the data and information provided to us is complete and sufficient.

#### **Scope of Assurance**

The scope of work agreed upon with Airbus includes the following:

- Environmental indicators as reported for 2007 within the Environment, Social and Economic Report.
- Visits to the Airbus Central Entity and Toulouse and Hamburg sites.

#### The scope of work does not include:

- · Economic and social indicators
- · Verification of baseline data
- Interviews with external stakeholders

The verification was conducted during May 2008.

#### **Verification Methodology**

DNV is a leading service provider of sustainability solutions, including verification of sustainability reports. Our environmental and social assurance specialists work in over 100 countries. Our assurance engagement was planned and carried out in accordance with the DNV Protocol for Verification of Sustainability Reporting.

#### In that respect, the Report has been evaluated against the following criteria:

- Adherence to the principles of Materiality, Completeness, Reliability, Comparability and Accuracy, as set out in the AA1000 Assurance Standard, and
- The GRI G3 Sustainability Reporting Guidelines.

#### As part of the verification we have:

- Challenged the environmental statements and claims made in the Report and assessed the robustness of the data management system, information flow and controls;
- Examined and reviewed documents, data and other information made available to DNV by Airbus;
- Visited the head-office and 2 main production sites located in France and Germany;
- Conducted interviews with 15 representatives (including data owners and decision-makers from different divisions and functions) of the Company;
- Performed sample-based audits of the mechanisms for implementing the Company's own environmental policies, as described in the Report;
- · Performed sample-based review of processes for determining material environmental issues to be included in the Report;
- Performed sample-based audits of the processes for generating, gathering and managing the quantitative and qualitative environmental data included in the Report.

#### **Conclusions**

In our opinion, the environmental indicators in the Company's 2007 Environment, Social and Economic Report meet the content and quality requirements of the GRI - G3 Sustainability Reporting Guidelines.

We believe Airbus' efforts to embed its sustainability approach into the business and manage its environmental reporting activities are progressing steadily towards an advanced level. We welcome the Company's continuous improvement activities and in particular the dedicated commitment shown at all levels of management.

#### **Principal Considerations**

#### **Materiality**

Based on our review, we consider that the Report includes the major material aspects concerning Airbus' environmental performance. The process to determine material issues and indicators, and their inclusion in the Report, should be formalised and explained in more detail.

#### Completeness

We believe that, overall, the environmental topics and indicators contained in the Report cover Airbus' material environmental impacts sufficiently to enable stakeholders' assessment of the Company's environmental performance in 2007. The exceptions relate to under-reporting of certain environmental indicators, e.g.  $CO_2$  emissions from the Company's own internal fleet (though we appreciate the mention of the Internal Fleet and its impacts in the report we could not directly verify the reported  $CO_2$  emissions, and related GHG emissions are excluded from relevant indicators), wastes and water consumption from on-site catering activities, impacts derived from the manufacturing of regional aircraft (ATR).

#### Reliability

Overall, we found that the environmental information and processes are sufficiently collated, recorded, compiled, analysed and disclosed in a manner that allowed us to examine and establish the quality and materiality of the information.

#### Comparability

We consider that stakeholders have sufficient environmental information that is adequately selected and compiled in order to analyse the changes in Airbus' performance over time. However, consistency of data calculations should be strengthened or adequately explained for certain indicators.

#### **Accuracy**

We consider the reported environmental information to be sufficiently accurate and detailed for stakeholders to assess Airbus' performance. We are not aware of any misstatements in the assertions made.

#### **Opportunities for Improvement**

The following is an excerpt from the observations and opportunities reported back to the management of Airbus. However, these do not affect our conclusions on the Report, and they are indeed generally consistent with the management objectives already in place.

- A more formalized and centrally coordinated process for assessing the materiality of environmental issues, both at local and global levels, would strengthen the focus of future reporting and serve as a valuable basis for the Company's management of environmental risks and opportunities.
- The Company's process for stakeholder engagement should be enhanced, both internally and externally, to ensure more effective identification of stakeholders' expectations and their integration into future environmental reporting.
- Management and reporting of environmental data could be improved through stronger data ownership and riskbased controls as well as internal communication to share e.g. calculation methods.

#### **DNV's Independence**

DNV was not involved in the preparation of any statements or data included in the Report except for this Assurance Statement.

DNV expressly disclaims any liability or co-responsibility for any decision a person or entity would make based on this Verification Statement.

Signed:

Jean-Christophe CARRAU

Satian

Verifier

Eli Bleie MUNKELIEN
Global Manager Corporate Responsibility

EliBli Munkum

Det Norske Veritas. Oslo. November 12th 2008

## **GLOSSARY**

#### **Advisory Council for Aeronautics Research in Europe (ACARE)**

ACARE comprises about 40 members, including representation from the Member States, the European Commission, the manufacturing industry, airlines, airports, service providers, regulators, research establishments and academia. The council's primary mission is to establish and carry forward a strategic research agenda that will influence all European stakeholders in the planning of research programmes and materialise the ACARE Vision 2020. The key aim of the Vision 2020 is a world-class European air transport system that meets society's needs, including noise reduction, emission reduction, reducing travel delays, and safer air transport.

#### **Alternative fuels**

Any fuel that is not a conventional fuel – i.e. not derived from crude oil such as kerosene –, which could be considered for use in aviation turbine engines but which is not currently permitted by jet fuel specifications. Mainly, these include synthetic fuels, semi-synthetic fuels, bio-fuels and cryogenic fuels:

A **synthetic fuel** is synthetically produced from hydrocarbons containing feedstock – i.e. gas, coal, biomass – and most commonly via the catalytic Fischer-Tropsch process. Examples are Gas To Liquids (GTL), Coal To Liquids (CTL), Biomass To Liquids (BTL) and hydro-treated vegetable oils synthetic fuels.

A **semi-synthetic fuel** is a blend of a synthetic fuel with a conventional fuel that produces a "drop-in" replacement fuel (no required change to the aircraft or engines). The semi-synthetic fuel produced by the South African oil company SASOL is authorized by current major international jet fuel specifications when mixed in limited ratios with conventional fuels. It was certified on Airbus aircraft in 1999.

A **biofuel**, short for biomass fuels, is any sort of fuel produced from the biomass, whether from dry organic matter (e.g. firewood, alcohol fermented from sugar...) for first generation biofuels, or from combustible oils extracted from plants (e.g. soybeans, algae...) for second-generation biofuels. Biofuels also include the synthetic BTL fuels. These fuels are considered renewable as long as the biomass producing them is maintained or replanted. Their use in place of fossil fuels cuts greenhouse gas emissions because the biomass - the fuel source - captures carbon dioxide from the atmosphere.

A **cryogenic fuel** is a fuel that is stable only in its liquid state at temperatures below the freezing point of water, such as liquid hydrogen (LH<sub>2</sub>). Liquid hydrogen is not considered as a bio-fuel today since only very small quantities can be produced by other means than petrol, coal or nuclear power. It could only be considered as a fallback solution for the long term after 2050.

#### **Air Transport Action Group (ATAG)**

ATAG is a not-for-profit association with some 70 members worldwide that include airports, airlines, airframe and engine manufacturers, air navigation service providers, airline pilot and air traffic controller unions, chambers of commerce, tourism and trade partners, ground transportation and communications providers. ATAG's aim is to define common positions on aviation infrastructure and environmental issues and to make expert and constructive contributions to the industry and governmental consultation process.

#### **Biodiversity**

Biological diversity - or biodiversity - is often understood in terms of the wide variety of plants, animals and microorganisms, but also includes genetic differences within each species and the variety of ecosystems and interactions of its life forms, including humans.

#### Carbon monoxide (CO)

Carbon monoxide (CO) emissions result from incomplete fuel combustion. For aircraft engines, the level of CO emissions depends very much on the thrust level. CO emissions are high per kilogram of fuel consumed at low engine power setting (taxi or approach) and low during take-off and cruise.

#### Carbon dioxide (CO<sub>2</sub>)

Carbon dioxide  $(CO_2)$  is a non-toxic, naturally occurring gas, also a by-product of burning fossil fuels, and one of the 'greenhouse gases' that affects the Earth's temperature.  $CO_2$  emissions result from complete fuel combustion and are directly proportional to fuel burn, by a factor of 3.15.

#### Climate change

Change of climate, which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

#### **Eco-Efficiency**

In simplest terms, eco-efficiency means creating value with less environmental impact. It is achieved by "the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing environmental impacts and resource intensity throughout life-cycle to a level at least in line with the Earth's estimated carrying capacity" (World Business Council for Sustainable Development).

#### **Environmental Management System (EMS)**

The integrated group of procedures, methods, practices and policies relying on a systematic and performance indicators-based approach that is used to manage environmental issues and related-organization risks through the whole lifecycle of a product, service and process.

Environmental management systems are founded on internationally recognized principles or standards, such as ISO 14001 or EMAS. They offer the possibility of a more flexible, more effective and less costly way to reduce or eliminate the environmental footprint of a company.

#### Fuel cell

A device that transforms the energy contained in hydrogen and oxygen into electricity by a "cold" combustion. The exhaust products are pure water and heat. Fuel cells are emission free and the by-product (water) could be used for the aircraft water and waste systems, making the aircraft lighter and thus increasing the aircraft's fuel efficiency.

#### Greenhouse gases (GHG)

Gases present in the atmosphere that have been produced either naturally or as a result of human activity. The greenhouse gases concerned by the Kyoto Protocol are carbon dioxide (CO<sub>2</sub>), nitrous oxide (N2O), methane (CH4), hydrofluorocarbons (HFC), sulphur hexafluoride (SF6) and perfluorocarbons (PFC). Of these six gases, CO<sub>2</sub> is the only one produced by aviation. Greenhouse gases help make the earth habitable by warming it, but beyond a certain threshold, their accumulation creates detrimental global warming.

#### **Global warming**

The progressive gradual rise of the earth's surface temperature responsible for changes in global climate patterns. Global warming has occurred in the distant pass as the result of natural influences, but the term is most often used to refer to the warming occurring and predicted to further occur as a result of increased emissions of greenhouse gases.

#### International Air Transport Association (IATA)

The worldwide association of airlines, bringing together some 230 airlines with 93% of scheduled international air traffic. Its mission is to represent, lead and serve the air transport industry.

#### International Civil Aviation Organization (ICAO)

ICAO, the United Nations' agency for civil aviation, works for the safe, secure and sustainable development of civil aviation through cooperation amongst its member states. ICAO's Committee on Aviation Environmental Protection (CAEP) undertakes most of the work in environmental protection. ICAO has established three environmental goals: (1) to limit and reduce the number of people affected by significant aircraft noise; (2) to limit and reduce the adverse impact of aviation emissions on local air quality and; (3) to limit or reduce the impact of aviation greenhouse gas emissions on the global climate.

#### **Intergovernmental Panel on Climate Change (IPCC)**

A panel of worldwide experts established by the World Meteorological Organization (WMO) and the UN Environment Programme (UNEP) to assess the fallback effects of the scientific, economic and social impacts of climate change. This intergovernmental body surveys worldwide scientific and technical literature and publishes assessment reports that are widely recognized as the most credible existing sources of information on climate change. IPCC was awarded with the Nobel Peace Price in 2007. Upon ICAO's request, IPCC produced a special report in 1999, "Aviation and the global atmosphere", which evaluated the current (2%) and future (3% in 2050) share of aviation's CO<sub>2</sub> emissions with regards to all man-made ones.

## GLOSSARY

#### International Organisation for Standardization (ISO)

A non-governmental organization - members are national standards institutes of 156 countries - to facilitate the international coordination and unification of industrial standards.

The ISO 14001 standard establishes environmental organisation and management system requirements to prevent pollution and to reduce the effects of a given operation on the environment.

#### Life Cycle Assessment (LCA)

The life-cycle concept is a "cradle to grave" approach to thinking about products, processes and services. It recognizes that all product life-cycle stages, from design to end of life, have environmental and economic impacts. The main tool supporting the life-cycle thinking concept is Life Cycle Assessment (LCA), whose principal aim is to specify the environmental consequences of products and services.

#### **Local Air Quality (LAQ)**

LAQ is the generic term for gathering the impact of aviation at low altitude. ICAO defines this part of the atmosphere as being below 3,000 feet.

#### **Noise**

**Noise abatement** is the reduction of noise during aircraft operations. There are several methods, including preferential runways and routes, as well as noise abatement procedures for take-off, approach and landing. The appropriateness of any of these measures depends on the physical layout of the airport and its surroundings.

A **noise footprint** is an area with a given noise level at its perimeter. Noise levels are lower outside and higher inside this perimeter.

The **noise margin** is the difference between the actual noise level emitted and the maximum noise level permitted according to the regulation (ICAO Chapter 4). The margin is calculated in EPNdB.

A **noise quota** is used to cap the total noise budget from aircraft operations within a given area, over or around the airport, to some established total value over a given period of time (e.g. six months, one year...). Noise quotas may be based on a historic noise level at the airport or on a future noise goal for the airport.

#### Nitrogen oxides (NOx)

Collective name for various compounds of oxygen and nitrogen. NOx is produced as air passes through high temperature/high pressure fuel combustion, mainly during take-off and climb.

#### **OHSAS 18001**

The OHSAS 18001 standard establishes organization and management system requirements for an occupational health and safety (OH&S) management system, to enable an organization to control its OH&S risks and improve its performance.

#### Registration, Evaluation and Authorisation of Chemicals (REACH)

REACH is a new European Community Regulation on chemicals and their safe use (EC 1907/2006). It deals with the Registration, Evaluation, Authorisation and Restriction of Chemical substances. The REACH Regulation gives greater responsibility to industry to manage the risks from chemicals and to provide safety information on the substances. Manufacturers and importers will be required to gather information on the properties of their chemical substances, which will allow their safe handling, and to register the information in a central database run by the European Chemicals Agency (ECHA) in Helsinki.

#### Single European Sky Air Traffic Management Research Programme (SESAR)

SESAR is the European Union's Air Traffic Management modernization programme - and the technological component of the Single European Sky (SES), aimed at sustaining the expected increase in air traffic over the next 20 years.

#### Sulphur oxides (SOx)

Collective name for various compounds of oxygen and sulphur formed in fuel combustion. The amount emitted depends on the sulphur concentration in the fuel.

#### Sustainable development

Simply put, the concept of sustainable development relates to the maintenance and enhancement of three fundamental fields: environmental protection, social justice and economic growth. As expressed by the 1987 UN World Commission on Environment and Development (the Brundtland Commission), sustainable development "meets the needs of the present without compromising the ability of future generations to meet their own needs."

#### **United Nations Convention on Biological Diversity (CDB)**

A pact among the vast majority of the world's governments that sets out commitments for maintaining the world's ecological underpinnings as we go about the business of economic development. The CDB establishes three main goals: the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits from the use of genetic resources.

#### **United Nations Environment Programme (UNEP)**

UNEP is the United Nations' designated entity for addressing environmental issues at global and regional level, coordinating the development of environmental policy consensus by keeping the global environment under review and bringing emerging issues to the attention of governments and the international community for action.

#### **United Nations Global Compact**

The world's largest voluntary corporate citizienship initiative launched by the United Nations to advance ten universal principles in the areas of the environment, human rights, labour, and anti-corruption. The Global Compact brings the private sector together with U.N. agencies and civil society to tackle the challenges of globalization.

#### **Volatile Organic Compounds (VOC)**

Organic chemicals that easily vaporise at room temperature. VOCs include a wide range of individual substances, such as hydrocarbons, halocarbons and oxygenates. Most originate from transport operations and solvent use.

#### **World Business Council for Sustainable Development (WBCSD)**

The World Business Council for Sustainable Development (WBCSD) is a CEO-led, global association of some 200 companies, providing a platform for business to explore sustainable development, share knowledge, experiences and best practices, and to advocate business positions on these issues in a variety of forums, working with governments, non-governmental and intergovernmental organizations.

#### World Economic Forum (WEF)

Incorporated as a foundation in 1971, and based in Geneva, Switzerland, the WEF is an independent, impartial and not-for-profit international organization committed to improving the state of the world by engaging leaders in partnerships to shape global, regional and industry agendas.

# ABOUT this Report

#### FOR MORE INFORMATION, PLEASE CONTACT

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#### **FEEDBACK**

Stakeholders' dialogue is essential for continuously improving Airbus ESE reporting process. We value your opinion on our report and welcome any suggestions on how to improve it. Please feel free to send us your comments or suggestions.

#### REPORT PRODUCTION

#### **Print**

To keep the environmental impact of the report as low as possible we have only printed 300 copies. The report has been printed on 100% recycled FSC stock with FSC certificated printers.

#### **Digital**

We have produced 500 reports on re-usable USB sticks. All  $CO_2$  generated during the production of this USB device has been offset by the Carbon Neutral Company @. This product fully conforms to RoHS Directive (EU Restriction of hazardous substances). The wood in this product is PEFC certified so harvested in an environmentally sustainable manner from European forests and the production is certified according to the leading environmental management standard, ISO14000.

A downloadable pdf version of this report is also available at www.airbus.com

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