French Civil Aviation Authority (DGAC)

Environmental Report
for 2009

Resources, land, habitats and housing
Energy and climate
Sustainable development
Risk prevention
Infrastructure, transport and the sea

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On the Right Track

If 2008 was a transition year for environmental policies in the aviation sector, 2009 saw good environmental practices move into the implementation phase and start to take root.

Given the abrupt arrival of a crisis which hit the aviation sector particularly hard, it was by no means a foregone conclusion that the great momentum built up by France's "Grenelle" round table process on environmental issues would remain one of the top priorities for an industry undergoing major strain. But that was nevertheless the case, and the past year saw several major new developments.

First and foremost, the decision to include the aviation industry in the emissions trading scheme was a sign of the European Union's determination to act against climate change, while also remaining open to the possibility of joint initiatives with other countries.

Via the Council for Civil Aviation Research (CORAC), the entire community of aircraft manufacturers, airlines, airports and administrations set in motion a joint project.

The agreement signed on January 28, 2008 meanwhile passed its second anniversary, with its full range of measures going full steam ahead.

If the year 2009 saw the completion of a number of projects, it was in no way the end of the process. Internationally, the Copenhagen Conference was unable to deliver the drafting of ways to keep CO_2 emissions under control, despite a very marked change in the stance of the airlines and their representatives, who now want to be part of a post-Kyoto treaty. On the national level, talks underway on an increase in corridor altitudes around Orly Airport show that more powers of persuasion are going to be needed if we are to bring in new procedures yielding collective improvements. I have no doubt that these challenges we are facing will continue to keep people mobilised, and that answers will be provided in the years to come.

Patrick Gandil,
Director, French Civil Aviation Authority

ENVIRONMENTAL REPORT for 2009

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1.

CURBING AVIATION'S SOUND FOOTPRINT

In 2009 the aviation sector pushed ahead with initiatives set in motion by France's Round Table ("Grenelle") process, and the year also saw progress in the field of home soundproofing. The DGAC's top priorities were noise monitoring initiatives in the vicinity of airports, the assessment of new operational procedures and work on acoustic certification to improve both noise prevention and dealing with existing noise.

THE ENVIRONMENTAL ROUND TABLE PROCESS The Aviation Sector Still Highly Mobilised

Significant Measures

For a second year, the DGAC saw very positive gains from the agreement of January 28, 2008, which committed the entire French aviation industry community to environmentally friendly policies. As regards the fight against noise pollution, all the commitments made yielded practical measures by the relevant partners, despite an overall situation that was aggravated by the economic crisis.

Among significant measures was the publication on February 27, 2009 of a government decree allowing for incentives to renew aircraft fleets by adjusting landing fees. The policy is based on the principle of applying fee reductions or increases based on both the time of day and the sound performance of the planes involved.

The policy of raising arrival flight path altitudes over the Paris region went ahead. For Orly, a public inquiry into boosting altitudes to 1,200 metres (4,000 feet) was completed in 2009 and the consultation phase got under way.

The process of assessing continuous descent approach (CDA) procedures for Orly, which began in the second half of 2008, was completed, opening the way to implementation.

FACT

- **Compared to a conventional staged landing method, the noise reductions gained from a continuous descent approach (also known as optimized profile descent) procedure are four dB at a point 24 kilometres from the runway threshold, and can reach seven dB at a distance of 35 kilometres.**

A DR400-180 R craft fitted with the ANIBAL propeller.

INTERNATIONAL Action and CERTIFICATION

Certification

Work on the acoustic certification of planes went on without respite in 2009, with the aim of both improving our knowledge of aircraft noise and developing tools to help implement possible regulations.

During the year the DGAC notably carried out flight-testing of the A330 MRTT aircraft with a view to its acoustic certification. The certification process for this military in-flight refuelling craft based on the A330-200 should be completed in 2010.

Static (test-bed) trials of the PW 4170 engines that are due to be fitted on civilian A330s were monitored in the United States for the European Aviation Safety Agency.

The DGAC also pushed ahead with the job of re-certifying Airbus planes from Chapter III to Chapter IV[1]. These operations have resulted in a new acoustic certification putting aircraft in the Chapter IV category, created in 2001 to adjust for progress made over almost four decades.

The DGAC further continued acoustic certification work for a large number of light aircraft fitted with silencers.

International Action

In 2009 the DGAC's acoustic certification experts took part in several ICAO working and study groups, in particular to prepare for the eighth meeting of the Committee on Aviation Environmental Protection (CAEP/8), which took place in February 2010. The aim of CAEP/8 is to look into the possibility of either drafting a new standard that will be even stricter than the current Chapter IV, or to tighten the present rules for the latter. Within the ICAO, the DGAC's specialists also carried on with work on in-flight procedures for helicopters and on the trade-off between noise and gaseous emissions, given that current improvements in noise performance may come at the price of increased atmospheric pollution. The DGAC also took part in drawing up a new procedural manual for demonstrations aimed at harmonising acoustic certification levels around the world.

(1) See the glossary entry on the ICAO chapter ranking system.

THE IMPACT OF ACOUSTIC CERTIFICATION

Acoustic certification of aircraft under the auspices of the ICAO made its appearance in the 1970s, at a time when the introduction of jet planes was sparking protests from people living near airports both in the United States and Europe. Certified noise levels are now used in local regulations to help implement operational restrictions such as bans on night flying and other time-based rules. They have had a major economic impact. Data collected during acoustic certification tests is also used to draw up noise exposure maps and for studies into so-called "least noise" operating methods.

KEEPING STANDARDS IN LINE WITH TECHNICAL DEVELOPMENTS

One of the aims of the working groups convened within the CAEP framework is to adapt standards to technological advances in aircraft design. For example, such advances can mean that engine sounds that were previously not heard, because they were muffled by the two main sources of noise – jet exhaust (due to the ejection of gases) and turbofan rotation – become audible.

A Year of Renewal in the Policy of **Protecting Local Residents from Noise**

2009 was a record year for the number of housing units declared eligible for soundproofing grants – a total of 5,638. This unprecedented development was due above all to efforts made to deal with a backlog in grant applications that had built up at certain airports thanks to an increase in takings from the Aviation Noise Inconvenience Tax (known as TNSA from its French abbreviation). It was thereby possible to mop up, a year ahead of schedule, a backlog of 1,500 pending applications at Orly, and to also catch up with the process at Nantes, where requests made at the start of 2009 were being dealt with, as planned, at the end of the year.

These positive results are also due to new incentives provided for in a decree dated June 9, 2009 concerning group applications for soundproofing grants. This made it possible for managers of condominiums and public housing units, as well as any grouping of five individual owners living under the same local authority, to benefit from increased grants for both soundproofing itself (95% instead of 80% of the cost) and for the initial surveys, which are covered for the full amount.

Soundproofing Grants

To date these have concerned France's ten biggest airports: Paris-Charles de Gaulle, Orly, Strasbourg-Entzheim, Basel-Mulhouse, Lyon-Saint-Exupéry, Nice-Côte d'Azur, Marseille-Province, Toulouse-Blagnac, Bordeaux-Mérignac and Nantes-Atlantique. Soundproofing grants are financed from the Aviation Noise Inconvenience Tax, or TNSA. Despite the effects of the economic crisis on air transport, the TNSA brought in 60 million euros over the year, almost as much as in 2008.

At the start of 2009 the DGAC commissioned a major survey from the TNS-Sofres polling organisation to get a better idea of local residents' views and measure the level of satisfaction with the soundproofing grant system. The study, carried out on 3,600 people living near nine of the ten airports where grants are available, found that almost three-quarters of respondents who were eligible for help had already carried out soundproofing work. Two avenues were suggested to try and reach people who had not yet undertaken such work. They were:

– Improving the financial terms on offer (both qualitatively and quantitatively);
– Providing better information on the grant system: 34% of eligible local residents said they had not heard of the system[1].

It is also noteworthy that residents who had carried out soundproofing work had a globally positive opinion of the grant system. 91% of respondents in that category said the effectiveness of the work done was satisfactory. •

(1) The bringing in of a 95% grant for group soundproofing operations is an initial response to the issue of financial help. The publishing, due in the spring of 2010, of a decree exonerating residents from having to advance the cost of the work is a second such response. The question of upper limits on the amounts of work involved is also under examination.

NOISE around Airports under CLOSE SCRUTINY

Monitoring Campaigns

In 2009 the DGAC pushed ahead with its work on monitoring noise levels around airports.

At Orly, measurements were taken to help assess continuous descent approach (CDA) procedures for arrivals from the south-west, and in east-facing landing configurations. They showed gains of between four and seven dB in comparison with a conventional approach.

At Nice, a series of tests was carried out on the acoustic impact of thrust reversers, which can be used during landing approach under certain conditions. The study found that such procedures were not being used abusively (they concerned 4% of arriving flights).

At Strasbourg-Entzheim the data collected during tests on continuous descent approach (CDA) procedures were published in December 2009. They confirmed the gains in both quietness and fuel consumption to be expected from such procedures.

At Le Bourget, the number-one business flying airport in Europe, a series of measurements provided a better understanding of observed noise levels.

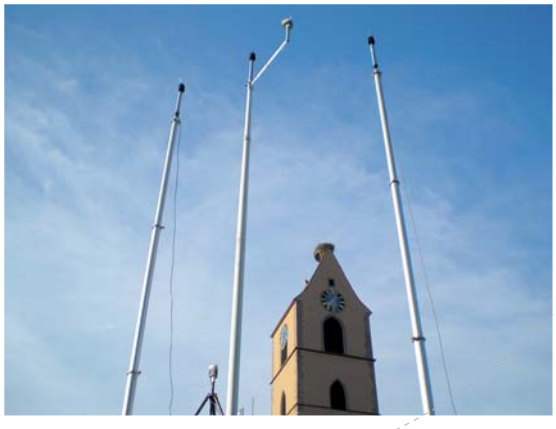
Impact Studies

Air traffic impact studies are carried out to assess the effects of any change in procedures in the vicinity of the ten main French airports. They are designed to make it possible to understand and measure the environmental impact of procedural changes. Such studies are carried out by the DGAC, under methodological rules approved by France's Independent Monitoring Authority for Airport Noise Pollution (ACNUSA).

In 2009 five studies were carried out by the DGAC, at the airports of Beauvais, Bordeaux, Caen, Deauville and Orly. At Bordeaux the study focused on a new departure procedure which avoids overflights of the conurbation and cuts the number of local residents exposed to noise levels of over 65 dB by 7,500. At the Beauvais-Tillé Airport the studies found that an increase to 900 metres (2,950 feet) of the interception threshold for the instrument landing system (ILS) had cut the take-off noise impact of planes by between two and five dB.

FACT

- **Between July 2008 and June 2009 the noise level due to Air France's activities on the ten main French airports was 21.9% lower than in 2005.**



New Avenues for Curbing the IMPACT of OVERFLIGHTS

Continuous Descent Approach

As laid down during France's "Grenelle" Environmental Round Table process, the DGAC has for several years been implementing a range of operational practices aimed at contributing to the environmental efficiency of air traffic. Within this framework, the rolling-out of continuous descent approach procedures makes it possible to cut fuel consumption, gaseous emissions and noise in terminal zones. The procedure, which eliminates the horizontal flight stages that cause extra noise during landings, is being tried out on several airports in mainland France, during low traffic periods. At Marseille, assessment of a procedure brought in in 2007 for north-west facing arrivals continued in 2009. For the procedures tested in 2008 at Orly and Strasbourg, the results compiled in 2009 were positive.

Estimates calculated by the Corsair Fly company, a partner in the tests carried out at Orly, found that a Boeing 747 weighing 260 tonnes could cut its fuel consumption by 600 kilograms per flight – equivalent to a carbon footprint saving of 1,800 kilos of CO_2) – in comparison with a conventional approach procedure.

For its part the Régional airline, a partner in the tests at Strasbourg Airport, estimated that the gains made in the terminal zone thanks to a continuous descent approach included fuel savings of almost 35%.

Quieter Procedures

In the light of problems caused for a number of local residents around the Nice-Côte d'Azur Airport, procedures for east-facing take-offs put in place in April 2008 were modified in 2009. The corrective measures made it possible to return to an initial environmental situation that residents consider more satisfactory. These decisions confirm the high priority given to consultation and slashing noise inconvenience. A sound monitoring programme has been started to measure the precise effects of the changes.

Tests of a new north-west-facing take-off procedure at the Toulouse-Blagnac Airport continued in 2009. Implemented between 10:30 pm and 6:00 am and at weekends, the procedure avoids overflights of several villages, notably Merville and Grenade.

CLOSE-UP

DEALING WITH NOISE AROUND AIRPORTS: THE "BALANCED APPROACH" PRINCIPLE

Adopted by the ICAO in 2001 and taken up in Europe the following year, the principle known as the "balanced approach" is aimed at harmonising anti-noise policies. The idea being to think globally in handling airport noise problems, taking account of the likely effects of measures to cut aircraft noise at source, moves required on the land and urban planning level, "least noise" procedures and operating restrictions. Both the costs and the advantages of the planned actions have to be taken into account, as have the specific characteristics of each airport. Furthermore, the measures taken must be proportional to the environmental aim being pursued.

Enhanced PREVENTION and Processing INITIATIVES

Strategic Noise Mapping

A European directive dated June 25, 2002 made it obligatory for strategic noise maps and environmental noise action plans to be drawn up, notably around airports handling more than 50,000 movements per year. The DGAC has completed work on noise maps for nine French airports in all, the most recent being that of Paris-Le Bourget, finished in 2009. The resulting maps are published on the web sites of the central government offices (prefectures) in each relevant department, and can also be consulted on the site of the Ministry for Ecology, Energy, Sustainable Development and the Sea (www.developpement-durable.gouv.fr). Work on drawing up Environmental Noise Action Plans based on the maps continued in 2009. The Basel-Mulhouse and Lyon Airports have submitted initial drafts for such plans to their respective Environmental Consultative Commissions. The two sets of tools, maps and plans, should result in a shared approach to prevent or curb the environmental effects of exposure to noise.

Town Planning Constraints

Noise exposure maps, known as PEBs from their French initials, concern a total of 216 aviation facilities in France. Revision of these documents continued throughout the country in 2009. During the year, work on revising the map for Orly, which dates from 1975, was relaunched. Orly is currently the only one of the ten biggest French airports for which the PEB has not been updated. The revision should notably make it possible to adjust for a change in the acoustic index used to measure noise inconvenience, and also changes to operational conditions at the facility. Elsewhere, several noise exposure maps were approved during the year, notably for the Biarritz airfield.

THE DIFFERENT ZONES COVERED BY AN EXPOSURE MAP

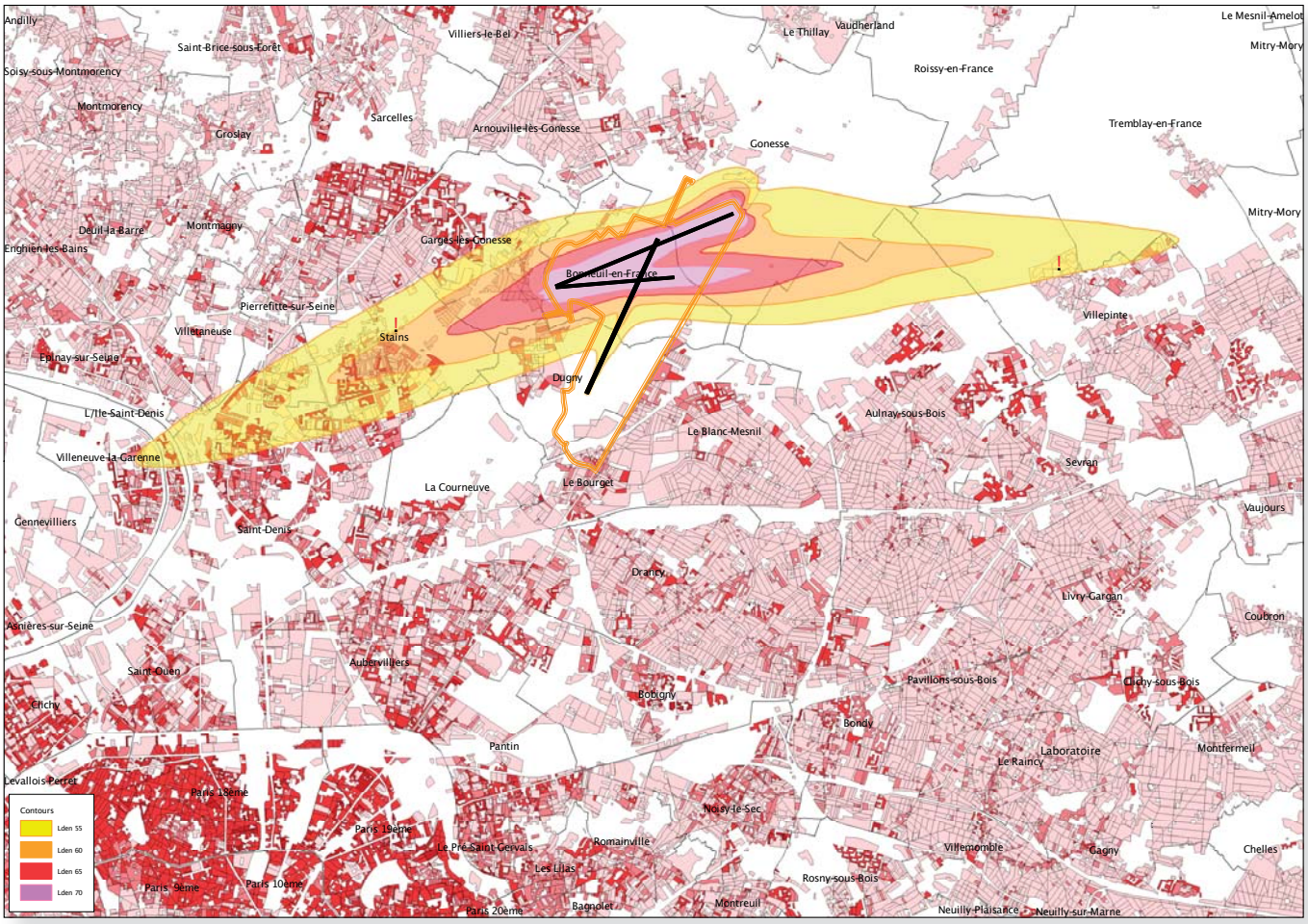
A noise exposure map defines four types of zone in relation to the level of inconvenience caused. It is based on a composite index known as Lden, for "level day evening night", which assigns different weightings depending on the time of day. Evening flights are assigned a weighting increased by five dB, while night flights are scored at +10 dB. Zones designated "A" or "B" on such plans are considered "high-noise"; it is forbidden to either build new structures or concentrate existing ones. In "C" zones, classified as "moderate noise", only low-density housing may be developed. Since 1999 the law has provided for a fourth zone, "D", in some regions. In such zones, new building can only take place if it is soundproofed during construction.

CLOSE-UP
LIGHT AVIATION DOES ITS BIT TO FIGHT NOISE POLLUTION

In 2009 the regional services of the DGAC channelled a total of 91,000 € to general aviation clubs to help them reduce noise pollution caused by light aircraft. The measures encouraged include the fitting of exhaust silencers on flying school aircraft, the use of quieter three-bladed propellers and in the case of gliding clubs, the acquisition of launch winches to cut the need for towing by powered craft.
The year also saw the adoption by the European Parliament of a resolution on an "Agenda for a sustainable future in general and business aviation". This notably calls for studies into the need to change basic demands concerning the environmental standards applicable to aviation.
2009 also saw consultations on the "helicopter" decree, which aims to curb traffic by such craft over zones of high population density.
In particular, studies were initiated on ways to reduce noise inconvenience caused by the Issy-les-Moulineaux heliport on the outskirts of Paris, and notably to seek complementary sites which could absorb part of its traffic in the region.

It is up to the aviation sector to take environmental protection issues into account upstream of all its decisions.

STRATEGIC NOISE MAP FOR THE PARIS-LE BOURGET FACILITY - OCTOBER 2009 (SCALE 1:50,000)



2. CUTTING POLLUTION FROM AIRCRAFT EMISSIONS

In 2009 the DGAC stepped up its efforts to both monitor and reduce harmful emissions produced by the air transport industry. The year saw preparatory work on bringing aviation into the ETS, or Emissions Trading Scheme, participation in the fight against climate change being waged by major international organisations, and analysis of air quality in the vicinity of airports.

Fighting CLIMATE CHANGE

Working with the GIACC

In 2009 the DGAC took part in the two meetings convened by the Group on International Aviation and Climate Change (GIACC). The GIACC was set up in 2007 with the aim of drawing up a global plan to reduce greenhouse gas emissions caused by the international aviation industry. France has defended the view that it should seek stricter aims than would result from simple ongoing improvements. It has also maintained that the means to reach such targets should include, beyond technological and operational advances, economic measures such as emissions quota exchanges. In October 2009 a high-level ICAO meeting finally approved the GIACC's plan to draw up non-binding targets aimed at improving energy efficiency by 2% worldwide. The meeting also proposed complementary studies on the possibility of adopting more ambitious measures further ahead. Such as, for example, carbon-neutral growth, and a global framework for the implementation of market measures. The ICAO submitted the plan to the Copenhagen Summit in December 2009.

Studies within the CAEP Framework

The DGAC pushed ahead in 2009 with projects under way in the ICAO's Committee on Aviation Environmental Protection concerning aircraft noise, gaseous emissions in general and greenhouse gas emissions in particular. Important forecasting and modelling work is also under way to assess the environmental and economic impacts of new standards which could be proposed by the CAEP. The DGAC is financing the participation of three independent experts in study groups tasked with analysing the prospects for medium and long term research to facilitate future choices on noise, fuel consumption and emissions of nitrogen oxides.
At the end of 2009 preparatory work on the meeting of the CAEP/8 steering group, due in 2010, was devoted to drafting a new standard on CO_2 emissions and the possibility of more binding noise standards.

HOW THE FRENCH VIEW THEIR CIVIL AVIATION INDUSTRY

The annual survey carried out by the DGAC on the "image of civil aviation" showed a clear improvement in how the general public perceive the environmental impact of the industry. In 2009, 71% of those questioned considered that air transport constituted a major source of inconvenience and pollution, a seven-point drop from the level of 78% found in the previous year. CO_2 emissions remained the top problem attributed to air transport – it was rated as number-one by 40% of respondents – ahead of noise (34%) and local air pollution (25%).
(Source: Inquiry into the Image of the Civil Aviation Industry).

First In-Flight Demonstrations for the AIRE Project

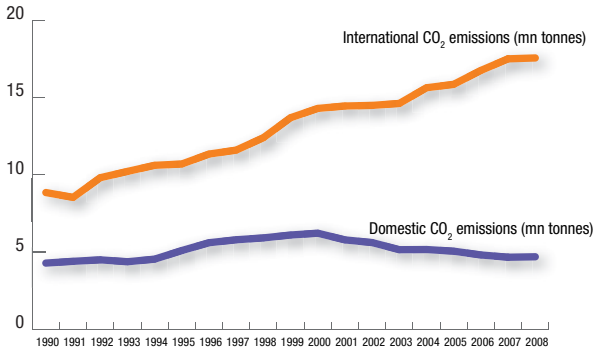
The Atlantic interoperability Initiative to Reduce Emissions (AIRE) was launched jointly by the European Commission and the US Federal Aviation Administration in June 2007. The partnership aims to cut both CO2 emissions and noise made by aircraft through the implementation of innovative methods and modern technology. Via a contract signed with the Single European Sky ATM Research Joint Undertaking (SESAR JU) and in cooperation with Air France and the Paris Airports Company ADP, the DGAC set up and carried out some 80 demonstration flights in 2009. It was thereby possible assess the environmental benefits of new procedures such as ascents, approaches and continuous descents, and show savings of between 150 and 1,250 kilograms of fuel per craft, depending on the flight phase. Thanks to the very encouraging results obtained from these initial assessments, air traffic procedures were changed to allow for the introduction of better environmental practices. As a result, continuous descent approach procedures will be published for Orly in 2010, while new arrival procedures for transatlantic flights coming in to Charles de Gaulle are already operational. Work is going ahead to continue the operations carried out in 2009. To that end, SESAR JU launched invitations to tender in 2010 for the holding of demonstration flights aimed at validating the operational solutions assessed in 2009.

A FEW FIGURES

- **CO_2 emissions due to the French air transport industry came to 22.3 million tonnes in 2008, a level unchanged from the previous year.**

The development of the air transport industry has seen continual improvements in energy efficiency. Since 1990, CO_2 emissions per passenger have fallen by 19%.
(Source: DGAC-SDE)

CO_2 EMISSIONS DUE TO FRENCH AIR TRANSPORT



CO_2 emissions caused by French domestic travel have decreased markedly since 2000. This is due both to gains in efficiency and to the transfer of some traffic from planes to the high-speed rail (TGV) network. Emissions due to international air transport have increased by 98% since 1990. They were very slightly up in 2008, at 17.6 million tonnes of CO_2 as against 17.5 million tonnes in the previous year.

Data: DGAC-CITEPA

Preparing to introduce the ETS

In 2009 the DGAC worked on preparing to apply the Emissions Trading Scheme to aviation, which is due to happen in 2012 for all aircraft with a maximum take-off weight of over 5,700 kilograms both on departure from and arrival at European Union airports.

For the aviation sector, the number of CO_2 quotas (1 quota = 1 tonne of CO_2 emitted) to be made available for the 2013-2020 period has been set at 95% of the overall emissions level of 2005. All CO_2 emissions over and above that ceiling will have to result in the purchasing of quotas assigned to other sectors.

In February 2009 the European Commission sent the DGAC an initial list of 500 operators for which France is considered responsible. In August 2009, the complete list assigned more than 1,000 operators to the DGAC.

The list is to be updated each year to account for the arrival of new operators, or the disappearance of others.

Informing Operators

Right from the start of 2009, the DGAC launched an information campaign, involving meetings to explain the principles of the ETS and the sending out of explanatory bulletins, to help operators file their activity and emissions plans on time for the deadline of August 31, 2009 set by the European Commission.

In July 2009 the DGAC also boosted its campaign by putting up information pages in French and English on its web site at http://www.aviation-civile.gouv.fr/html/prospace/reglemen/textes_sceqe_uk.html. The aim being to help operators to better understand the overall principles and provisions of the ETS directive and to easily find links to the main sites needed to allow them to implement it. The DGAC thereby examined and approved no less than 450 activity and fuel consumption monitoring plans provided by operators. •

Preserving Local AIR QUALITY

Ensuring Air Quality in the Greater Paris Region

A Regional Air Quality Plan (PRQA) was adopted for the Ile de France, or Greater Paris, region on November 26, 2009. Its 17th recommendation relates to airport activities, and the DGAC took part in drawing it up with the aim of both preventing and reducing atmospheric pollution and reaching the air quality targets called for by the regulations. Among the initiatives mentioned as being desirable, and also called for by the Atmospheric Protection Plan (PPA), are curbs on the use of APUs and participation in several emissions studies that are either ongoing (the SURVOL survey in the Regional Environment and Health Plan) or to come in the long term.

Measuring Atmospheric Pollution

The results of an atmospheric pollution monitoring campaign carried out by the DGAC's technical service (STAC) at the Nantes-Atlantique Airport were published in the spring of 2009. The measurements showed that concentrations of pollutants at the facility do not exceed the levels allowed under the regulations.

At the Lyon-Saint Exupéry Airport, the STAC's mobile lab carried out measurements of regulated atmospheric pollutants (including SO_2, NO, NO_2, benzene, CO and ozone) at the end of 2009.

Analysing and Tracking

Since 1995 OCEAN, a DGAC-developed tool for calculating the annual emissions due to aircraft has been used to track total fuel consumption alongside emissions of hydrocarbons (HC), carbon monoxide (CO) and nitrogen oxides (NOx) due to commercial air traffic at the 50 biggest French airports. The DGAC has also completed development of a guidance application drawn up by the Interprofessional Technical Centre for Atmospheric Pollution Studies (CITEPA). This tracks 15 different atmospheric pollutants emitted by all sources on the ground at airports.

An Independent Air Quality Monitoring Body

Under the French environmental law known as "Grenelle II", the independent pollution monitoring authority ACNUSA, which had previously been competent only for noise pollution, was also given the task of keeping tabs on local air quality around airports. This change was approved by the French Senate on October 8, 2009 and is due to be confirmed by the lower house of parliament in the course of 2010.

WHAT ARE THE SOURCES OF AIR POLLUTION AROUND AIRPORTS?

The main pollutants affecting air quality in the vicinity of airports are nitrogen oxides (NOx), carbon monoxide (CO), unburnt hydrocarbons (HC), volatile organic compounds (VOC), sulphur dioxide (SO_2) and particles. They come in part from aircraft, in part from induced road traffic and also from ground-based airport activities such as handling, maintenance and energy production.

Fighting WATER and GROUND POLLUTION

Helping Airports Combat Ground Pollution

At the end of 2009, following on from four monitoring programmes carried out since 2006 at the Toulouse, Le Bourget, Montpellier and Hyères airports, the DGAC produced a technical CD-ROM guide on the impact of airport activities on earth quality.

Fighting Pollution Due to Chemical Solvents

In 2009 the DGAC pushed ahead with experiments on filtering via plants (rhizospheres), carried out in partnership with Aéroports de Paris and the civil engineering laboratory in the town of Trappes. Implemented at Orly Airport, the experiment aims to provide airport operators with technical data on the environmentally-friendly treatment of run-off polluted with de-frosting and de-icing chemicals.

Also in 2009, the DGAC carried out an initial series of tests on the performance of de-icing chemicals used in France. The results should provide better understanding of these products, and thereby contribute to alleviating environmental risks.

USING REEDS TO TREAT AIRPORT WASTEWATER

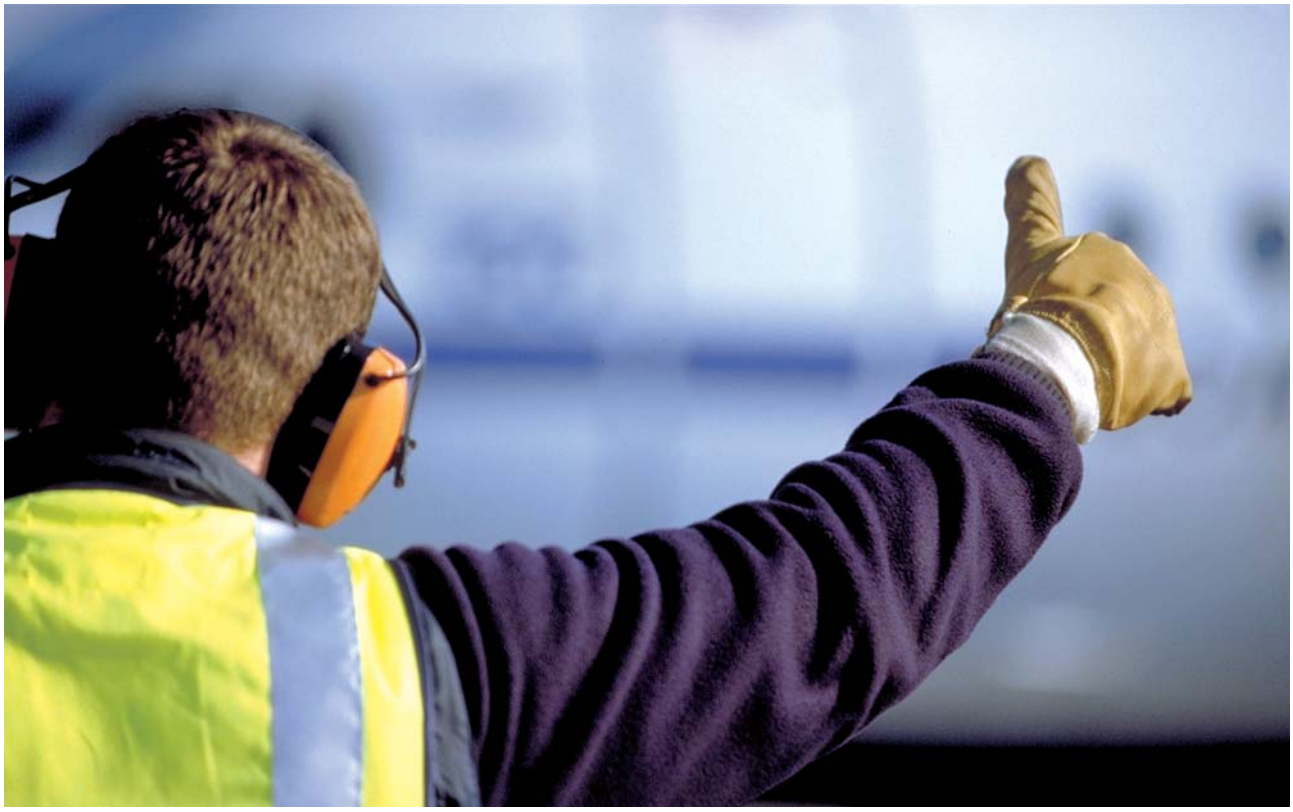
The technique of planting reedbeds, which the DGAC is testing, is based on the combined effects of the natural filtering functions of plants and the ability of micro-organisms found in the resulting artificial wetland (the rhizosphere) to absorb impurities in wastewater.

3.

CONSULTING, COMMUNICATING, FULFILLING COMMITMENTS

In 2009, the DGAC boosted its information efforts aimed at the general public and civil society. It also pushed ahead with its missions of consultation and monitoring commitments made in the environmental field.

Respecting COMMITMENTS MADE



Annual Progress Report on the Agreement of January 28, 2008

Tasked with monitoring respect for the commitments made by the air transport industry players who signed the convention of January 28, 2008, the DGAC submitted its first annual progress report in January 2009. Despite the economic crisis which hit the industry hard, all the commitments made by the various parties as regards curbing noise and gaseous emissions, improving the environmental performance of air navigation or carrying out research resulted in practical initiatives.

A Guide to Airports' Carbon Footprints

In 2009 the DGAC went ahead with drawing up a methodological guide, produced in partnership with the French Agency for the Environment and Energy Management (ADEME), on the production of standardised carbon footprint assessments for all airports. Under the agreement of January 28, 2008, each facility made a commitment to produce such reports.

The Global Weighted Measured Noise Index (IGMP)

The DGAC, which has the job of monitoring the IGMP indicator created to track acoustic energy emitted by air traffic at Charles de Gaulle Airport, submitted the 2008 value of the index to the independent ACNUSA agency in September 2009. For the first time since the IGMP was introduced, in 2003, its value was slightly down compared to the previous year. The fall was due in part to a decline in traffic caused by the economic crisis, but also the fact that airlines had upgraded their fleets to bring in much quieter aircraft.

Single Contact Points for the Public

Airport operators and the civil aviation authorities have set up unified structures to provide information to local residents and register their complaints. These contact points make for speedy and comprehensive responses. For example, almost all the 227 complaints recorded in 2009 by the Beauvais-Tillé Airport were collected via a toll-free telephone number.

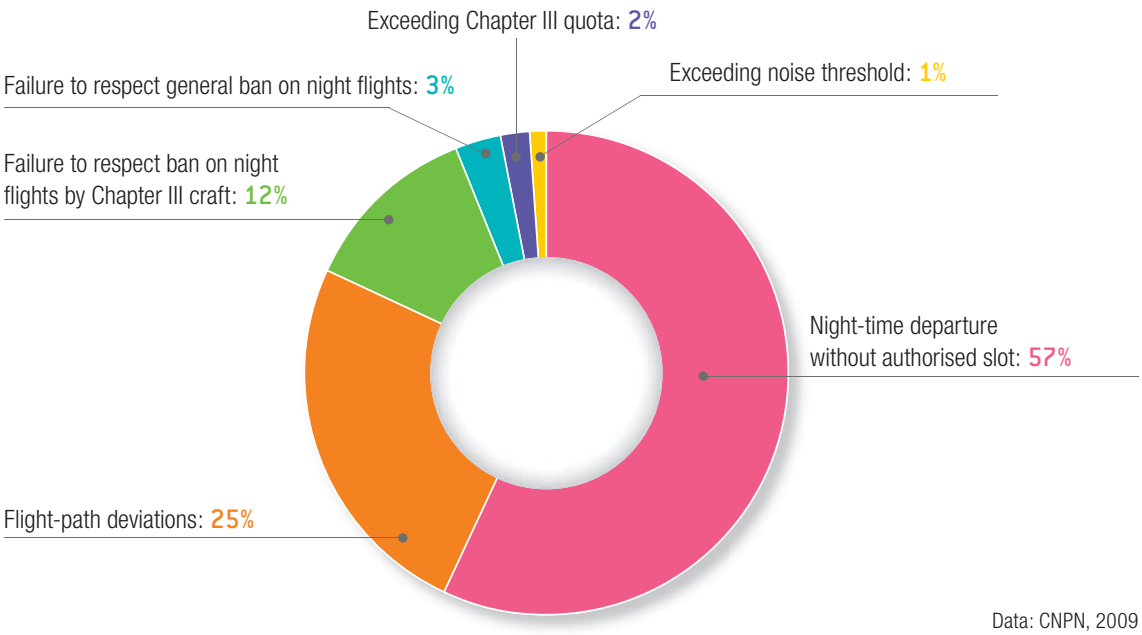
Codes of Good Conduct

Codes of good environmental conduct are based on the shared commitment of their signatories (airlines, professional bodies, airport operators and government agencies) to improve environmental quality in the vicinity of airports. In 2009 the Nantes-Atlantique and Toulouse-Blagnac airports signed codes of good environmental conduct, becoming the 7th and 8th facilities to do so in France.

A Continuing Decline in the Number of Violations

As of December 31, 2009 the Independent Monitoring Authority for Airport Noise Pollution (ACNUSA), responding to a proposal of the National Committee for the Prevention of Nuisances, had levied 387 fines for a total of 2,921,750 euros, as against 454 fines totalling 4,026,600 euros in 2008.

NUMBER OF PENALITIES PROPOSED BY THE NOISE PREVENTION COMMITTEE IN 2009, BY TYPE OF INFRACTION



Data: CNPN, 2009

Informing the General Public

As regards the supply of information to the general public and civil society on environmental aspects of air transport, 2009 saw two innovations.

ENVILOGUE, an extranet site, was set up to provide information and a forum for exchanges with NGOs and local non-profit groups on major international issues. Created at the end of 2008 by the French Ministry for Ecology, Energy, Sustainable Development and the Sea, the site allows NGOs and associations to access information such as technical specifications, event schedules and the minutes of meetings on environmental issues handled by the ministry. Thanks to ENVILOGUE, NGOs and local groups can engage in dialogue with the ministry on questions related to current international issues.
The site is updated by the ministry's services, and the DGAC helps by contributing to the "sustainable transport" section. In 2009 the DGAC also provided NGOs and associations with fact files on the ongoing creation of the Functional Airspace Block for Central Europe (FABEC), bringing together France with five other European countries, on the SESAR programme to modernise Europe's air traffic control system and also on the future inclusion of aviation in the emissions trading scheme.

Information Available for All

2009 also saw the launch by the French General Commissariat for Sustainable Development of the www.toutsurlenvironnement.fr web site, aimed at providing information to the general public. The site results from a commitment made during the Environment Round Table, and is part of the Aarhus Convention, which aims to improve public awareness of environmental issues.
The site, whose name means "Everything about the Environment", offers the widest possible audience – members of the public, people involved in debates, companies, the media, teachers and researchers – a one-stop shop for the widest possible range of information. It consists of a catalogue of references linking to content available on existing sites and portals, along with a search engine.
Since the summer of 2009 the DGAC, via its Sustainable Development Service, has been indexing resources of interest to the general public. •

A Permanent Process of CONSULTATION

The Environmental Consultative Committees, or CCEs, bring together local residents and elected officials, plus aviation sector professionals. These bodies continued their work of consultation and dialogue in 2009, with a total of forty-seven meetings being held to examine issues related to the environmental impact of airport activities, notably as regards noise.

CCE Proceedings in 2009

The Civil Aviation Safety Services (DSAC) for northern France took part in ten CCE meetings in 2009, notably to mark the presentation of a draft noise exposure plan for Orly Airport.

The DSAC for the south-western region participated in eight CCE meetings, one of which, on December 9, 2009, saw the presentation of an assessment of the environmental charter for Bordeaux-Mérignac Airport for 2007-2009.

In the east-central region, CCEs convened five times during the year. In October, a meeting of the committee for Lyon-Saint Exupéry Airport saw exchanges of information with partners on the drafting of an Environmental Noise Prevention Plan (PPBE), the submission of a report on soundproofing grants and "commitments for the environment" to cover the 2009-2013 period.

In 2009, the airports of the south-eastern region saw a total of five CCE meetings. In the case of a number of airfields for

THE CCE: A FORUM FOR DIALOGUE AND CONSULTATION

Environmental Consultative Committees for airports were first created in 1987, and over time they have become authentic tools for dialogue and consultation on all environmental issues arising from all aspects of airport operation. Their members are chosen from three constituencies, each of which enjoys equal representation. They are associations of local residents, local government authorities and the professionals – operators, users, staff – who work in the aviation industry. CCEs are compulsory for the ten biggest airports, and their brief notably covers any changes to or revisions of noise exposure maps (PEBs), and the implementation of measures decided upon within the framework of environmental charters. The CCEs also have the right to take cases to the Independent Monitoring Authority for Airport Noise Pollution (ACNUSA).

WORKING GROUPS FOR SUSTAINABLE DEVELOPMENT AT CHARLES DE GAULLE

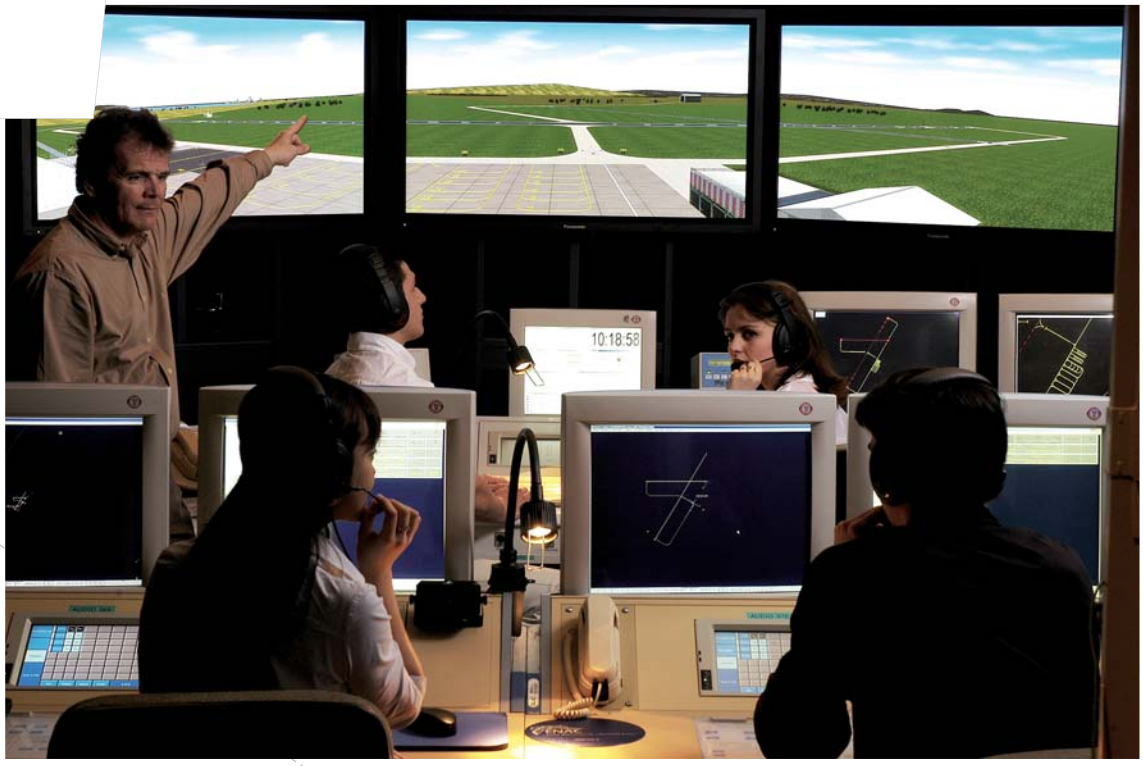
In 2009 the implementation of proposals and aims expressed in the report "For Sustainable Development at Charles de Gaulle Airport", by Jacques Demargne, president of the French Social and Economic Council, entered a new stage. Eight working groups were set up on different themes, each one including all key institutional, economic and local groupings. The DGAC is in charge of running two of the groups: one on curbing noise and the other on help for local residents.

which full CCE meetings could not be held during the year, consultations nevertheless went on throughout the period with the convening of several permanent committees, environment charter monitoring bodies or working groups on specific fields such as helicopter traffic, flight path changes, etc.

Whether for prior consultations or day-to-day information, dialogue and transparency are the key to preserving trust

The DGAC Favours Transparency

As regards Charles de Gaulle Airport, the DGAC has followed up the CCE meetings with exchanges with local residents and non-profit groups, seeking greater transparency on the environmental impact of the air transport industry.
Meanwhile, on the sidelines of institutional consultations, the DGAC regularly meets with non-profit groups and local elected officials to gain better understanding of their expectations and explain the constraints on sustainable development for air transport.



Training on ENVIRONMENTAL Issues

Training on the fundamentals of environmental issues (relating to the physical, biological and human spheres) went ahead in 2009 via courses dispensed to pilots and other staff, including the various technical professions involved in civil aviation.

On the issue of noise, a growing number of professionals have been taking part in training on the INM computer program, used to draw up noise distribution maps.

From beginners to postgraduate students, not forgetting staff on part-time training courses, the ENAC teaches the basics of sustainable development in the air transport industry.

Since June 2009 France's National Civil Aviation School ENAC, in partnership with the Civil Aviation authorities, has been offering a course on curbing the impact of airport de-frosting and de-icing activities on the quality of rainwater runoff and soil. A wide variety of bodies, such as the DGAC, Airbus, Air France and the weather-forecasting agency Météo France, have contributed to the course.

Improved COMMUNICATION and TRANSPARENCY

In 2009 the DGAC pushed ahead with the development of tools to provide information to local residents and the general public.
The "Vitrail" system for monitoring noise and aircraft flight paths was extended to cover seven more local authorities in the Greater Paris region. The system can now be consulted in twenty-one towns and villages of the region, as well as in the Environmental and Sustainable Development Resource Centres of Charles de Gaulle and Orly. It provides local residents with information on flights going over their homes, with a 30-minute time lag.

FACT

- **In 2009, the DGAC answered over 800 questions it was asked on overflights.**

In December 2009 the DGAC published its 9th information bulletin on air traffic in the Greater Paris region. The document is based on questions asked by the general public in regions affected by the activity of the three main Parisian facilities (CDG, Orly and Le Bourget). It is available at no charge, and can be downloaded from the DGAC's web site.
Another tool set up as a result of the Environmental Round Table is a carbon footprint calculator, which provides an estimate of the amount of CO_2 generated by flights leaving from France and serving a total of 800 destinations around the world. It can be consulted on the government's web site at www.developpement-durable.gouv.fr/aviation/eco-calculateur/index.php.

The DGAC stand at the 48th Paris Air Show in 2009.

SUSTAINABLE AIR TRANSPORT: BUILDING AWARENESS IN THE GENERAL PUBLIC

For the DGAC, it is important to provide explanations to citizens who ask legitimate questions about the environmental impact of air transport, and on the constraints on the development of the activity, which must also respect the quality of life for nearby residents. Which is why, at the Paris Air Show of 2009, the DGAC set up a stand on these issues for the general public. It provided visual displays of flight paths, explanatory panels on other issues, and information packs.
At the Festival of sustainable transport and mobility, held in Paris, the DGAC showed visitors the air navigation zones set up within the Environmental and Sustainable Development Resource Centres of Charles de Gaulle and Orly. These facilities, which have been run since 2006 by air traffic controllers, provide information on air traffic facilities, overflights of the Paris region and the types of landing and take-off procedures in use.

4.

PREPARING FOR THE FUTURE

Via its participation in major European innovation and technological development programmes and its support for national research efforts, the DGAC is pushing ahead with and boosting its efforts to create a more environmentally efficient aviation industry.

European MOBILISATION for SUSTAINABLE AVIATION

Towards a Single European Sky

In 2009 the development phase of the Single European Sky Air Traffic Management (SESAR ATM) programme, the technical side of the Single European Sky effort, started. The aim is to progressively deploy a new air traffic management system. This ambitious programme began to get off the ground in June 2009, when the sixteen SESAR partners, including the DGAC's Air Navigation Services Department, signed contracts for a total of 1.9 billion euros, to cover seven years. Between now and 2020, the SESAR programme aims to triple Europe's air traffic capacity, while at the same time cutting the environmental impact of each flight by 10% and multiplying safety levels by ten.

A More Environmentally-Friendly Aviation Industry

In June 2009 the CleanSky joint technology initiative launched its first call for proposals on research and development in the field of aeronautics, covering 72 subjects in all. Part of the European Union's 7th Research Framework Programme, CleanSky brings together public and private partners in a coordinated joint approach aimed at speeding up the emergence of the radical new technologies needed if the aviation industry is to become environmentally-friendly. Alongside French companies and research bodies, the DGAC has promoted this important research effort, which provides for 1.6 billion euros, provided half-and-half by the European Commission and industrial firms, to be efficiently used over seven years.

CLEANSKY'S ENVIRONMENTAL AIMS

Bringing together industrial air transport companies and research centres, the European CleanSky project is aimed at creating a new generation of more environmentally friendly aircraft. It is structured around six technological demonstrators: "Smart" fixed-wing craft involving active wing technologies, green regional aircraft, rotorcraft, engines, systems and eco-design. Each of these themes aims to deliver substantial cuts in environmental impact. For example, the green engines programme is expected to provide reductions of between 15 and 50% in CO_2 emissions, while the eco-design project could deliver cuts of between 12 and 20%. As regards noise, the "green engine" demonstrator aims to achieve cuts of 15 dB, and the "systems" theme could yield reductions of 17 dB in aircraft sound levels. As such, CleanSky is coherent with the ambitious aims set by the Advisory Council for Aeronautics Research in Europe (ACARE): to slash CO_2 emissions by 50%, NOx levels by 80% and noise by 50% between now and 2020.

Intelligent wings: the Bell-Boeing 609 tilt-rotor craft.

A Ten-Year Roadmap for Aeronautical Research

Despite a global economic crisis which did not spare the air transport industry, 2009 saw several major initiatives in technological innovation and research.
The initial proceedings of the French Civil Aviation Research Council (CORAC) laid down the technological roadmap which should guide the overall research effort over the coming ten years. The brief of CORAC, which was set up in July 2008, is to define and implement the research and technological innovation programmes laid down by France's "Grenelle" Environmental Round Table. It sets orientations and optimises the efforts of air transport partners in the field of technological research. The roadmap drawn up in 2009 thus brings together and coordinates all research activities in the fields of aircraft (architecture and airframe), propulsion (for both fixed-wing craft and helicopters), onboard systems and air navigation.
Several key research orientations have been set, such as lightening airframe structures, improved aerodynamics, work on innovative architectures or improved engine performance. Other key themes in the CORAC's work are the creation of more electric aircraft, and intelligent mission management (data exchange systems making it possible to optimise a flight in the light of parameters such as fuel consumption or noise).
In 2009 the DGAC also pushed ahead with work under way in the field of new fuels and energy sources, a result of the creation in 2007 of the Future Aeronautical Fuels (FCA) project. Every three months this brings together, on the initiative of the DGAC, all private and institutional French bodies involved in fuels and alternative energy sources. An initiative which takes on added significance given the current situation of ever rarer and more expensive fossil-fuel energy sources.
The FCA initiative is based on the activities of two sub-groups, one of which works on the environmental and economic aspects of new fuels, and the other on issues arising from certification and qualification standards[1].
A test flight carried out in 2008 by Airbus with one of its A380s, using an alternative synthetic fuel produced from gas (gas-to-liquid, or GTL) shows the kind of implications this project could have for the aviation sector. •

(1) Such as the French Oil Institute (IFP), the ONERA aerospace lab, Total France, Air France, Aéroports de Paris, the French General Armaments Directorate, the Propulsion Test Centre, the Toulouse Applied Science Institute (INSA), etc.

Craft with high-speed propeller system (Dornier-Seastar).

Increased DGAC Support for ENVIRONMENTAL RESEARCH

A NATIONAL EFFORT IN FAVOUR OF GREEN AVIATION

Among the aims of the 35-billion-euro French bond issue announced by the head of state in December 2009 is "inventing mobility solutions for the future". This means that aircraft development is one of the programme's priorities. The proposals drawn up by the DGAC and its partners, under the auspices of the CORAC aviation research council, have been favourably received and the government bond issue will provide financial support for research and development on ultra-green planes intended to be on the market by 2020.

In 2009 the DGAC supported sustainable development of the aviation industry by devoting a large part of its budget to technological research on projects capable of reducing the industry's environmental footprint. The DGAC notably boosted its efforts to support industrial partners, such as the ONERA national aerospace laboratory.

The DGAC's support for research programmes covered the entire range of aeronautical disciplines. As regards new architectures, a variety of research angles were promoted, such as enhanced integration of engines and airframes, or cutting external aircraft noise.

Several programmes are also under way to reduce sources of both noise and greenhouse gases by cutting fuel consumption; examples are work on aerodynamic design and the increased use of lighter composite materials.

The DGAC is also backing a study into configurations which use new propulsion systems involving high-speed propellers; these efforts hold out the hope of a real technological leap forward in environmental terms.

Improving engine performance is another promising angle in efforts to reduce the environmental impact of air transport.

Lighter structures, improved thermodynamic and

WHAT BIOFUELS FOR TOMORROW?

First generation biofuels like ethanol or vegetable oil ethyl esters are mainly produced from crops, such as beet, cereals and sugarcane. They are generally unsuitable for aviation due to their lack of heat stability and low energy performance. Furthermore, their use can have a negative impact on food and water resources, and is therefore not compatible with a sustainable development approach.

Several experiments have been carried out in Europe and the United States on the use of second-generation biofuels. These are extracted from biomass, ie vegetable waste made up of robust plant species such as jatropha, or else from seaweed.

The International Air Transport Association (IATA) has set a target of 10% for the amount of biofuels to be used in the aviation industry by 2017.

Stepping Up Research Efforts Will Allow Us to Prepare the ***Technological Breakthroughs*** *that Will Meet Tomorrow's* ***Environmental Challenges.***

aerodynamic efficiency and better mastery of engine flows are examples of ways to cut both emissions and noise.

In 2009 the DGAC also provided support for technological research and development in systems and avionics, notably via the concept of "more electric" aircraft. Research under way into the design of on-board electrical generators, or more high-performance batteries (motors powered by fuel cells, for example) aims to reduce dependence on the propulsion system, and thereby cut the environmental impact of flights.

FACT

- **Thanks to improvements made to engines and airframes over the past 50 years, aircraft have become four times less noisy (source: CleanSky).**

5.

THE DGAC AND THE ENVIRONMENT

Following on from France's Environmental Round Table, the reorganisation of the DGAC has made sustainable development of the air transport industry one of the major themes of its activity. Alongside the reorganisation an action programme for sustainable development was launched within the DGAC in 2009: the Exemplary Administration Plan, known from its French abbreviation as PAE.

Implementing the EXEMPLARY ADMINISTRATION Plan

Sustainable Consumption, Sustainable Operations

In 2009 the DGAC launched its "Exemplary Administration Plan", piloted by its General Secretariat. Initiated by the Prime Minister with the aim of ensuring that the state and its various agencies set an example in the field of sustainable development, the PAE should allow the DGAC to optimise its own use of resources within the framework of its everyday operations, while building on the three main pillars of sustainable development as laid down by the Environmental Round Table process. The three pillars in question are the economy, the environment and industrial relations.

The Exemplary Administration Plan is an umbrella project resting on a series of underlying projects, the advancement of which determines in large part its effectiveness. For the DGAC, the underlying projects are:

- The deployment of the PAE itself, and the creation of an IT system dedicated to the DGAC's PAE (the ILIADE project);
- The record as regards greenhouse gas emissions;
- The administration's transport plan, including the development of car-sharing schemes;
- The energy efficiency of the DGAC's buildings;
- The setting up of a "buyers' network", with the creation of a "sustainable purchasing" charter for the DGAC;
- The creation of a catalogue of staff training courses which include issues relating to sustainable development.

During 2009 the DGAC therefore began deploying these projects, while at the same time pushing ahead with earlier ones, such as the introduction of a method for measuring greenhouse gases (known as the Bilan Carbone®, or carbon footprint report, drawn up by the ADEME agency). Already implemented for the headquarters building in 2007, the Bilan Carbone®process was extended to all the DGAC's services. The result, for all 39 services involved, showed that the DGAC's activities in 2008 produced some 127 kg/tonnes of CO_2 equivalent. Transport of all types accounted for 50% of total emissions, and energy required by premises accounted for 23%.

A New Computer Tool

At the same time the General Secretariat and the Air Navigation Services Department, or DSNA, created the new ILIADE information system which since November 2009 has made it possible for staff in each service to key in the relevant data, for automatic processing and transmission to the head office. This IT tool means that all the environmental, and also economic and social, data needed for the PAE is updated almost immediately. The ILIADE system, designed and produced by the DGAC, has been approved by the

Ministry of Ecology, which has decided to roll it out for all its own services both in Paris and around France.
As regards the transport plan and the energy efficiency audit and report, work got under way in 2009, while courses linked to sustainable development have been included in the DGAC's 2010 staff training plan.
The installation of a buyers' network became effective in 2009, and a sustainable purchasing charter was also drawn up.

The DGAC, an Ecologically Responsible Agency

The first assessment of the Exemplary Administration Plan was due in May 2010. The success of the approach depends on the skills of staff and experts who already have other responsibilities. Thanks to the initiatives already set up in 2009, the DGAC has strengthened its image as a prime mover as regards sustainable development and ecological responsibility.

Sustainable Development: WHO DOES WHAT AT THE DGAC?

By setting up the Air Transport Department (DTA) in 2008, the DGAC gave itself the means to make sustainable development one of its priorities.
Within the DTA, the Sustainable Development Service contributes, within its field of action, to the core missions of management. The Service is notably in charge of drawing up, and monitoring the implementation of, regulations aimed at curbing the negative effects of air transport on and around aviation facilities (noise and local pollution). The Sustainable Development Service also intervenes in the fight against climate change due to the aviation sector.
The main missions of the Sustainable Development Service are as follows:
– Curbing urban development around airports by drawing up and monitoring Noise Exposure and Noise Inconvenience Maps;
– Defining the legal, technical and financial framework for the system of home soundproofing grants for nearby residents;
– Keeping tabs on relations with the Independent Monitoring Authority for Airport Noise Pollution (ACNUSA);
– Drawing up and taking part in international work on sustainable development in air transport;
– Technical expertise in the field of environmental standards.

To carry out all of these missions, the DTA's Sustainable Development Service calls on the technical expertise of the Civil Aviation Technical Service (STAC).
The STAC draws up and distributes the tools and methodologies needed to both understand and reduce the environmental impact of the air transport industry (noise, atmospheric pollution, global warming and water and soil pollution). It works to measure these effects.
It also provides expertise for mapping and computer modelling of aviation noise (exposure and inconvenience maps), for the acoustic certification of aircraft and the inspection of automatic noise monitoring systems set up around airports.
For its part, the Environmental Mission of the Air Navigation Services Department, or DSNA, works to draw up strategic plans, as regards ways and means and operational procedures, aimed at curbing the environmental impact of air traffic in the vicinity of airports.
The main tasks of the Environmental Mission are to:
– Create tools and methods to analyse the impact of overflights for civil aviation procedures;
– Write any studies relating to the environmental impact of arrivals and departures procedures;
– Respond to requests for information from the Independent Monitoring Authority for Airport Noise Pollution (ACNUSA);
– Contribute to the design of both initial and further training courses in environmental fields;
– Reply to points raised by private citizens;
– Draw up briefs for operating restrictions following infringements of air navigation regulations in the Paris region;
– Write opinions for public inquiries in the event of flight path changes for the Paris region;
– Represent the air navigation authorities in international working groups on environmental issues.

For its part, the Environmental Mission of the Air Navigation Services Department is in charge of drawing up carbon footprint reports and other elements of the Exemplary Administration Plan.
As the creator of the ILIADE system, it also initiated the sustainable development aspects of the DSNA's integrated management system.

A

ACARE: Advisory Council for Aeronautics Research in Europe
ACNUSA: The French Independent Monitoring Authority for Airport Noise Pollution
ADEME: Agency for the Environment and Energy Management
AESA: the European Aviation Safety Agency
AIRE: Atlantic Interoperability initiative to Reduce Emissions
ANIBAL: French acronym for curbing noise levels of light aircraft
APU: Auxiliary Power Unit

C

CAEP: The ICAO's Committee on Aviation Environmental Protection
CCE: French Environmental Consultative Committee
CDA: Continuous Descent Approach
CITEPA: Interprofessional Technical Centre for the Study of Atmospheric Pollution
CLEAN SKY: A European Union programme to coordinate and optimise research into more a environmentally-friendly aviation industry
CO: Carbon monoxide
CO_2: Carbon dioxide
CORAC: Council for Aeronautical Research
CNPN: French National Commission for the Prevention of Nuisances

D

DGAC: The French Civil Aviation Authority
DSAC: The French Civil Aviation Flight Safety Group
DSNA: Air Navigation Services Department
DTA: the DGAC's Air Transport Department

E

EICA: Air Traffic Impact Study
ENVILOGUE: Extranet set up by the DGAC to communicate with NGO's and other non-profit groups on major international issues
EPNdb: Effective Perceived Noise in Decibels
ETS: Emissions Trading Scheme

F

FAA: The US Federal Aviation Administration
FABEC: Functional Airspace Block for Central Europe
FCA: French abbreviation for future aviation fuels
FPRD: Framework Programme of Research and Development

G

GHG: Greenhouse gases
GIACC: Group on International Aviation and Climate Change

H

HC: Hydrocarbons

I

IATA: International Air Transport Association
ICAO: International Civil Aviation Organization
IGMP: French abbreviation for Global Weighted Measured Noise Index (of emitted sound energy)
ILIADE: French acronym for administrative carbon footprint measurement system
ILS: Instrument Landing System
INM: French computer system for modelling and mapping noise

L

LDEN: Level Day Evening Night

M

MEEDDM: France's Ministry for Ecology, Energy, Sustainable Development and the Sea

N

NOx: Nitrogen oxide

O

OCEAN: French acronym for Tool to Measure Annual Aircraft Emissions
ONERA: French National Aerospace Laboratory

P

PAE: French Exemplary Administration Plan
PEB: French abbreviation for Noise Exposure Map
PGS: Noise Inconvenience Map
PPA: Atmospheric Protection Plan
PPBE: French Plan to Curb Environmental Noise
PRQA: Regional Air Quality Plan

S

SESAR: Single European Sky ATM Research
SO_2: Sulphur dioxide
STAC: Civil Aviation Technical Service
SURVOL: (literally, "overflight") a four-year study carried out on communities living near Paris's Charles de Gaulle, Orly and Le Bourget airports, as part of a regional health and environment plan

T

TNSA: French Aviation Noise Inconvenience Tax

V

Vitrail: System for monitoring aircraft noise and displaying flight paths
VOC: Volatile organic compounds

Chapters: Acoustic classification of aircraft as laid down by the ICAO. The acoustic performances of each type of aircraft are determined by three noise levels, measured on approach, at take-off under full throttle and during overflight. The corresponding levels must remain within limits set by the ICAO (Annex 16). Today the classification comprises three "chapters": II for the noisiest craft and III and IV for the quietest. All new aircraft must conform to chapter IV, which was drawn up in 2001.

www.developpement-durable.gouv.fr

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