



**GROUP OF EXPERTS ON THE ABATEMENT OF NUISANCES
CAUSED BY AIR TRANSPORT**

Seventy-ninth meeting

(Solothurn, 23-24 November 2010)

Agenda item 8: Developments in other fora

c) OBSA (Spain)

“SUSTAINABILITY IN AVIATION IN SPAIN”

(Presented by Spain)

SUMMARY

This paper describes and appends the Executive Summary of a recent report on “Sustainability in Aviation in Spain”, prepared by the Spanish Observatory of Sustainability in Aviation (OSBA). The report provides the Spanish aeronautical industry with integrated information and indicators to assist its decision-making, and includes trend information, potential measures for improvements in measures, and suggested best practice.

ACTION

ANCAT members are invited to note the paper and the OSBA report, and to consider the latter's possible wider relevance and use.

Appendix
English only**Introduction**

1. On 29 October 2010 the Spanish 'Observatory of Sustainability in Aviation' (OBSA) published in Madrid a report on "Sustainability in Aviation in Spain", for the year 2009.¹ A copy of the Executive Summary is at the **Appendix**.

2. This report represents a milestone in the analysis and evaluation of information concerning the sustainability of air transport. It is the first to analyse the sector in an integrated manner, on the basis of a reporting process which will be continued over the coming subsequent years and so provide a tool for observing and monitoring the development of aviation in Spain. This will contribute to the maintenance of an integrated and sustainable transport system. The report will be updated on a yearly basis.

Objectives of the report

3. The main objectives of the OBSA report were:
- a) to establish a national benchmark to facilitate the analysis and evaluation of existing information on sustainability and air transport, in its social, economic and environmental dimensions;
 - b) to provide an autonomous, objective and transparent diagnosis of the current and past position of the Spanish air transport sector;
 - c) to create a useful tool for decision-making, and to facilitate public participation through the application of indicators in the assessment of information; and
 - d) to identify possible areas for improvement in the aviation sector's sustainability, and build a tool that encourages initiatives in the aviation sector with a view to encouraging its growth in a sustainable manner.

¹ OBSA was established in 2007 by the Spanish State company SENASA (Servicios y Estudios para la Navegación Aérea y la Seguridad Aeronáutica SA, created in 1990 within the Ministry of Works and Transport). OBSA is a forum for the follow-up of policies and initiatives in order to achieve more productive and sustainable business models. It promotes inter alia the implementation of environmental targets for Spanish aviation, through collaboration between relevant government ministries and the aviation industry. Its multidisciplinary team of experts work together with external specialists to compile information on eg policies, legislation and technical documentation. Its website is www.obsa.org, where the full report on "Sustainability in Aviation in Spain" can be found.

A tool for decision-making

4. The OBSA report is addressed both to the public and private sectors, in Spain and beyond, and offers a methodology for their use. It presents a series of 22 indicators, 14 of them environmental, of the sustainability of aviation in Spain, with a view to establishing a baseline reference point. The indicators are designed to be consistent with those developed by the ICAO CAEP Group active in this area.² A fact-sheet is included for each of the sets of indicators to help interpretation, and a description is annexed of the calculation methodologies used.

5. The report reviews present policies and national and international strategies, and seeks to provide evidence for future decisions and strategies to be made in relation to the aviation sector, enabling them to be based on the best technical and scientific information available. It contains trend information, figures and forecasts, possible measures and best practices in environmental protection, and includes an extensive analysis of technical and scientific information using models and tools adapted to Spanish circumstances.

6. The report also aims to promote transparency within the sector, by integrating and providing public access to much information which is presently disaggregated. In this it is responding to demands for greater clarity around sustainability, and serving the needs of many different stakeholders - airlines, manufacturers, airports, maintenance, handling companies, Air Navigation Service Providers, and regulators - by making available reliable data for use in monitoring the implementation of environmental policies and strategies in the aviation sector.

Conclusion

7. ANCAT members are invited to note the paper, and the OSBA report, and to consider the latter's possible wider use.

² ICAO CAEP WG2 / TG2 Ad-Hoc Group on 'Environmental Indicators'.

APPENDIX

**EXECUTIVE SUMMARY OF REPORT ON
"SUSTAINABILITY IN AVIATION IN SPAIN"**



Sustainability in Aviation in Spain

Report 2009

Executive Summary

Observatory of Sustainability in Aviation

Sustainability in Aviation in Spain Report 2009

Executive Summary

SENASA



Sustainability in Aviation in Spain Executive Summary

Since its creation in 2007 as an initiative of SENASA, the Observatory of Sustainability in Aviation (OBSA) has realized several activities and projects designed to evaluate the status of the air transport sector in Spain related with sustainability. These activities culminate in the publication of this Report 2009, the first of its kind in Spain from an independent entity.

This report provides indicators of sustainability relating to air transport in Spain, whose main purpose is to serve as a reference and provide evidences, in this way, the decisions and strategies relating to aviation in Spain are made based on the best information available. The report will be renewed annually with the intention of contributing to sustainable development of the sector in Spain, so as to improve the sector transparency with citizens.

From the OBSA we wish that in this time of economic crisis, this report could help to the air transport sector in Spain to lead back to a business model more productive and sustainable as a future warranty.

2009, reference period of this report, it has been the year of the inclusion of aviation in the European system of emissions trading. It has also been a key year in which the commitments to alternative fuels for aviation adds a number of initiatives and testing, strengthen its use as a clear goal ahead.

The report makes explicit the impact on the sector of economic crisis, where social and economic benefits of air transport are resentful as a result of a fall in demand. However, emissions and energy consumption have been reduced along with a growing efficiency and a commitment sustainability of the sector; this has enabled the reduction of environmental impacts.

Considering a longer time period, since 2000, trends for improvement in sustainability of air transport in Spain are positive, mainly in relative terms. In absolute terms, it is still necessary to work through improvements in the operation, technologies and new fuels, to absorb growth and development effects of the sector.

The report executes an analysis by subject area, whose main conclusions are listed below.

Employment and economic development

From the socioeconomic perspective, 2009 was a year in which demand decreased significantly. The sustained decline in load factors, a key indicator of efficiency in transport, breaks with a steady trend of improvement since 2000; this reflects a period of adjustment of supply to demand which is expected to be settled from this year 2010.

The only positive socioeconomic indicator in recent years is the timeliness of operations. Punctuality, although improving, it does so slowly, reflecting the still low implementation of the mechanisms of Single European Sky (SES) and thus the persistence of inefficiencies in much of European airspace. Punctuality is a socioeconomic indicator that affects the quality of transport service, but is also related to parameters that affect energy consumption and emissions of each operation as: airspace congestion, the predictability of arrivals and departures, and the duration and length of routes.

- Between 2000 and 2009, total passenger demand in Spain increased by 34.2%, however, in 2009 decreased by 8% compared to 2008.
- In 2009, load factors have fallen compared to 2008. The values in 2009 are similar to those of 2002: 63%, 78% and 77% in the short, medium and long haul, respectively.

Territory

Spain has a wide network of airports, from which you can access a large number of locations and connections. Even when the Report 2009 does not make any diagnosis regarding this parameter it provides the basis for further analysis in subsequent years.

- The most common routes are Madrid-Barcelona in domestic flights, Madrid-Lisbon as European flight and Madrid-Buenos Aires as international non-European flight.

Climate change and energy efficiency

Despite the current situation, the sector has been able to adapt and keep the continuous improvement of energy efficiency of the fleet, reducing CO₂ emissions per passenger and kilometer by up to 20%. Despite these improvements achieved, the overall growth of the operation in the period 2000-2009 results in a net increase of greenhouse gas emissions and fuel consumption.

With respect to greenhouse gas emissions, aviation in Spain has not fixed for this period, a binding target. Spain, however, as State has set reduction targets and aviation sector can contribute.

- For diffuse sectors, where aviation can be considered include, the National Allocation Plan 2008-12 sets the goal that all diffuse sectors do not grow by over 37% on average for the period. Aviation has grown so far this period more than 50% (relative to 1990) but reductions in other diffuse sector may offset this growth.
- The European System of Emissions Trading has set reduction targets for all aircraft operating in Europe to play in 2012. If we make a move for Spain about the estimate in 2009 it indicates that we would be close to meet that objective if we maintain the current trend.

Haul	CO ₂ (g) per passenger and km [2009]	Variation 2000-2009	Litres (JetA) to 100 km (por seat) [2009]	Variation 2000-2009
Short (< 500 nmi)	287	- 20%	4.97	- 12%
Medium (500-2000 nmi)	143	-18%	3.10	-10%
Long (>=2000 nmi)	153	4%	3.43	- 7%

Air Quality

Emissions that affect air quality have been reduced in 2009 due to lower number of operations and also due to technological improvements in aircraft fleets.

Spain aviation doesn't have a binding target for this period with respect to the emission of these pollutants which affect air quality in absolute terms. However, Spain does have maximum national values (ceilings) in which aviation contributes and its achievement will require additional efforts in other sectors.

It is also noted that the situation of air quality (immission) in the airports environment meets the standards set by the regulations. The values of air quality at major airports are similar to those in large urban areas.

The aircraft engines used in Spain use advanced technology, so that their emissions meet current international standards too well, improving the standard by 66% for unburned hydrocarbons (HC), 49% for carbon monoxide (CO) and 28% for oxides of nitrogen (NOx).

Technological improvements achieved so far are more significant with respect to the HC and CO, while NOx will require qualitative leaps in technology for improvement.

- One of the objectives of the European Clean Sky ACARE for 2020 is reducing NOx emissions by 80% through improvements in aircraft technology and aerospace.

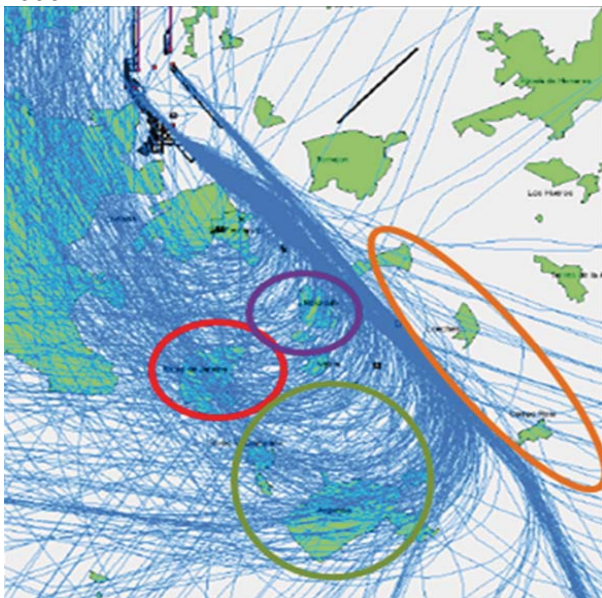
Noise

All the major Spanish airports have an airport planning, which includes estimates of people affected by noise according to different scenarios. However, the available data still do not allow changing trends of the population exposed and affected, although the investigation has begun. The growing number of homes where sound insulation is performed is reducing the number of people affected by noise.

It is important the great technological improvement as far as noise is concerned, the aircraft operating in Spain have a wide margin in compliance with international standards. This distance (margin) between the threshold levels for each aircraft and issuing securities has increased, on average, a 49% margin over the period 2000-2009, again reflecting the continuous technological improvement.

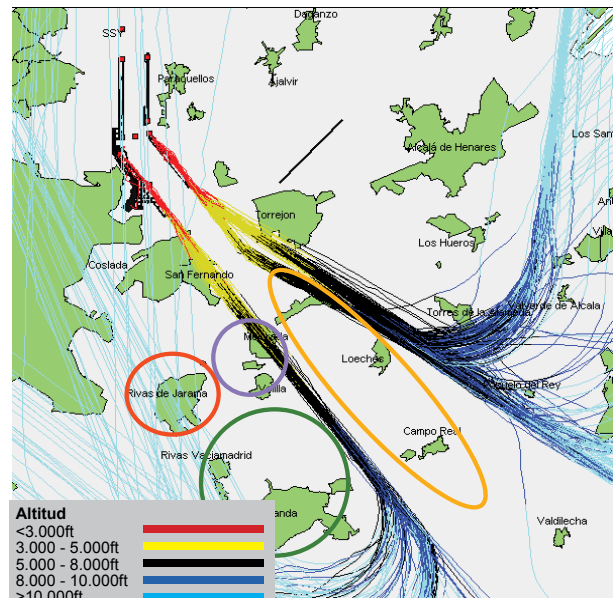
Technological improvements in aircraft and navigation systems, the joint work of different actors, and the adoption of operational measures are helping to mitigate noise in the airport environment. As an example, it's important the improved in path accuracy achieved in the airports of Madrid and Barcelona, which reduce the number of centers of population overflow.

2006



Dispersion of the output paths in the South Configuration during a day in Madrid-Barajas Airport. April 2006. The circles highlight the populated areas where drift reduction is a significant reduction of overflights. Source: SIRMA

2009



Dispersion of the output paths in the South Configuration during a day in Madrid-Barajas Airport. April 2009. The circles highlight the populated areas where drift reduction is a significant reduction of overflights.

Future tendency

With a slight recovery in passenger numbers during 2010, although reductions in the number of operations (about -5%), likely it will increase the load factor, reducing emissions and becoming more efficient passenger transport.

The great adjustment in costs will encourage, the capabilities of the operators, to replace most obsolete aircraft, obtaining medium-term improvements in energy efficiency, emissions and noise. This effect will be expected to increase from 2012 thanks to the European market for emission trading.





The implementation of operational improvements, encouraged by programs such as the Single European Sky (SES) or the AIR program, as well as technological development to achieve the Clean Sky program, they seek to achieve stabilization of the absolute growth in emissions.

These measures, together with the future use of biofuels, provide stabilizing emissions of greenhouse gases by 2020, target international aviation represented by the IATA (International Air Transport Association).

Assessment Indicators: summary table












Each of the indicators used in the report has been assessed from three perspectives:

- **Current status (2009):** indicator status in 2009 compared with the previous year (2008)
- **Tendency (2000-2009):** evolution of the indicator in the period 2000-2009
- **Objective:** When in the frameworks set a target with quantifiable and comparable data available, it assesses the current status of the indicator against that goal.

Icon	Evaluation
	Negative trend or disadvantaged compared to the goals defined
	Positive trend or compliance compared to the defined goals
	Stable trend, not initiated or indefinite compliance
	Unable to establish an evaluation with a tendency or a goal

Indicator	Evaluation	2009	2000-09	Goal
Employment and socio-economic development				
1.1 Demand	Although the trend has been growing, since 2007 a decline period has begun.			—
1.2 Load factor	Constant improvement, with a slight recession in 2009 in short and long ranges.			—
1.3 Airport ranking	EU: Madrid-Barajas and Barcelona occupy senior positions, by number of operations in Europe. World: Madrid-Barajas 11th in terms of number of passengers (in 2007 occupied 10th position).			—
1.4 Jobs created	It shows significant growth since 1998 with huge periods of crisis. Currently in decline.			—
1.5 Infrastructure's investment	According to the forecast of investment PEIT to 2007: - The investment in and maintenance is still lower than expected. (*) - Investment in aviation infrastructure (new developments) has exceeded the planned annual average. (*)	—		
1.6 Punctuality	There are no aggregate data available for Spain. At European level, comparing 2008 and 2009 the trend is improving, although still far from the reference level set by ACARE 2020.		—	
Territory				
2.1 Territorial connection	It is not possible to establish trend or comparison with available data.	—	—	—
2.2 Airport accessibility	The situation shown by the indicator is reasonable.	—	—	—

(*) Indicates that the goal does not apply exclusively to aviation or the goal is not directly transferable, so the evaluation should be interpreted as an estimate for illustrative purposes. For more information please see the file for each indicator in Chapter 2.

Indicator	Evaluation	2009	2000-09	Goal
Climate change and energy efficiency				
3.1 Greenhouse gas emissions	<p>In 2009, the cap (*) defined by Directive 2008/101/EC for the year 2012, in 2009 is exceeded only by 2%, which could be alleviated through market purchases. Since the distance is not much the current situation can be classified as positive.</p> <p>As established by the National Allocation Plan 2008-12, the average for aviation in the years of the period (2008 and 2009) for CO₂ exceeds +50% the target set for all sectors diffuse +37 % (*).</p>			 (ETS)  (PNA-08-12)
3.2 CO ₂ emissions per passenger and km	The trend is to reduce s efficiency is improving . Reducing is the tendency now, so efficiency is improving.			—
3.3 Fuel consumption	Although the trend has increased, the last years has declined.			—
3.4 Energy efficiency	The trend is to reduce consumption and thus improving efficiency. The average improvement from 2008 to 2009 is, for all types of movement, of 4.3%. The half-year improvement since 1991 is 1.3%, a ratio quite similar to the commitments of IATA and ICAO GIACC (1.5%).			

(*) Indicates that the goal does not apply exclusively to aviation or the goal is not directly transferable, so the evaluation should be interpreted as an estimate for illustrative purposes. For more information please see the file for each indicator in Chapter 2.

Indicator	Evaluation	2009	2000-09	Goal
Air quality				
4.1 NOx emissions (LTO)	Except in recent years, the cumulative emissions of NOx in Spain has followed an upward trend. Additionally, now over (in 2009) the established ceiling (*) by Directive 2001/81/EC (a play in 2010 to set national emissions).			
4.2 Emissions of acidifying gases and eutrophying and tropospheric ozone precursors	Except in recent years, the increase of these emissions has been increasing. It currently exceeds the established ceiling (*) by Directive 2001/81/EC (to play in 2010 to set national emissions) except in terms of NMVOC.			
4.3 Average margin of NOx, HC and CO	Progressive reduction of engine emissions with respect to the standards established by ICAO through CAEP for NOx emissions from aircraft engines.			
4.4 Air quality at airports	Data from available time series show a general trend of improvement.			—
Noise				
5.1 Airports with noise strategic planning	Obligation (Directive 2002/49/EC, Law 37/2003) of airports to have noise strategic planning. 100% of airports subject to this obligation have met it.		—	
5.2 Population exposed	It is not possible to establish trend or comparison with available data in terms of population exposed. Increased protection of the population, reflected in the increased number of insulated dwellings.		—	—
5.3 Acoustic efficiency	In comparison with the average EU-27 indicator shows better or similar ratios.		—	—
5.4 Average cumulative margin of the fleet	Over time it has developed a technological improvement and it is reflected in the reduction of noise emitted by the fleet operating in Spain.			—
5.5 Operational measures	Major airports use operational measures to reduce noise at the airport surroundings.		—	—
5.6 Trajectory accuracy	In Madrid and Barcelona airports it has been significantly improved			—

(*) Indicates that the goal does not apply exclusively to aviation or the goal is not directly transferable, so the evaluation should be interpreted as an estimate for illustrative purposes. For more information please see the file for each indicator in Chapter 2.