

Aéroports de Paris – 2013 Greenhouse Gas Emissions Report



Aéroports de Paris SA

YEAR 2013

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1 – PURPOSE OF THE REPORT

THIS REPORT HAS BEEN WRITTEN BY:

AÉROPORTS DE PARIS

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PURPOSE OF THE REPORT:

This report has been written as part of the project to measure the air emissions generated by Aéroports de Paris SA. The sites covered by the report are the Paris-Charles de Gaulle, Paris-Orly and Paris-Le Bourget airports, general aviation aerodromes, and the company head office in Paris (on boulevard Raspail). The reference year for when the first measurements were taken is 2011. This report has been written in accordance with Article 75 of Law no. 2010-788 of 12 July 2010, regarding governmental commitment to environmental protection.

REFERENCE DOCUMENTS:

Airport Carbon Accreditation (ACA) – Documentation and Guidance – Issue 8 – June 2014, hereafter referred to as "ACA Guidance".

ISO 14064-1 standard: Specification with guidance at the organisation level for quantification and reporting of greenhouse gas emissions and reductions

ISO 14064-3 standard: Specification with guidance for the validation and verification of greenhouse gas assertions

Method for taking greenhouse gas emission measurements in accordance with Article 75 of Law no. 2010-788 of 12 July 2010, regarding governmental commitment to environmental protection, version 2 - Ministry of Ecology, Sustainable Development, Transport and Housing

CITEPA guide (2010) on airport sources of emissions

2 – DESCRIPTION OF AÉROPORTS DE PARIS AND SCOPE OF THE STUDY

A public agency established in 1945 and changed to a public limited company in 2005, Aéroports de Paris organises, runs and develops the civil airport facilities located in Île-de-France.

The company is simultaneously the owner of airport sites and facilities and the manager for all airport activity. The Aéroports de Paris group had a turnover of €2.75 billion in 2013 and, as of 31 December 2013, employed 9,026 staff.

Aéroports de Paris SA operates 14 sites used for civil aviation, including Paris-Charles de Gaulle, Paris-Orly, Paris-Le Bourget and the Issy-les-Moulineaux heliport, which altogether handled 90.3 million passengers in 2013. Aéroports de Paris owns and runs the biggest airport network in Europe.

As the owner of airports and their facilities, the company is responsible for designing, maintaining and optimising the sites with a view to providing a quality service to all stakeholders operating in the airport. Aéroports de Paris is constantly developing its sites in support and anticipation of growth in air traffic. It is also a service provider and capitalises on its assets through its real estate business.

The managing directors of Paris-Charles, de Paris-Orly and Paris-Le Bourget are in charge of receiving and informing passengers and partners, and allocating resources - car parks, departure and arrival lounges, baggage conveyor belts, bridges signage in terminal buildings, and runway lighting. Aéroports de Paris is responsible for security checks of people and property. The Real Estate Division is responsible for the lay-out of the airports.

An introduction to the company and its sustainable development performance is available in the 2013 Environment and Social Responsibility Report and the Aéroports de Paris 2013 reference document that can be downloaded from www.aeroportsdeparis.fr/groupe.

The scope of this report are the Paris-Charles de Gaulle, Paris-Orly and Paris-Le Bourget airports, general aviation aerodromes, and the company head office in Paris (on boulevard Raspail). It does not consider Aéroports de Paris subsidiaries, but only the business activities of Aéroports de Paris SA.

The emissions sources taken into account are those that Aéroports de Paris has control over, both direct and indirect emissions from energy sources (reference document ISO 14064).

The emission factors used are those recommended by the ADEME in its Carbon Report v6.1 (June 2010).

3 – INVENTORY OF EMISSION SOURCES AT AN AIRPORT

3.1 Inventory of emissions

Airports comprise a highly diverse range of business activities. The list of emission sources at an airport has been compiled in a guide issued by the CITEPA (Interprofessional Technical Centre for Studies on Air Pollution). This guide was written upon request from the French Civil Aviation Authority in 2010.

The emission sources are listed in the following table, distinguishing between direct emissions on site and indirect emissions from off-site energy sources.

Direct emissions	Static sources	Thermal power plants
		Emergency generator equipment
	Mobile sources	Service vehicles
		refrigerants not used as energy sources (HFC, HCFC, SF ₆)
		Rainwater management
Processes	Composting	
Indirect emissions associated with energy	Purchasing energy	Purchasing electricity
		Purchasing heating

3.2 Direct emission sources

3.2.1 Thermal power plants and emergency generators that use fossil fuels

The Paris-Charles de Gaulle, Paris-Orly and Paris-Le Bourget airports have their own thermal power plants for heat generation. With each one generating over 20 MW of power, these natural gas power plants are incorporated into the National Allocation Plan for greenhouse gas emission quotas. As such, their CO₂ emissions are subject to strict monitoring. Paris-Charles de Gaulle airport has a cogeneration plant that is used to produce heat as well as electricity. It is one of the most energy efficient technologies, and helps reduce CO₂ emissions. A wood furnace was put into service in the 4th quarter of 2012.

The Paris-Orly airport used its geothermal energy for the entire year. This one had entered into service in the 1st quarter of 2011.

Emergency generators that run on domestic fuel are also used in the event of a power cut.

3.2.2 Service vehicles

Aéroports de Paris has a fleet of commercial vehicles, light-duty vehicles, and so-called special vehicles (lorries, shuttle buses to and from the airport, snow trains, degreasers, sweepers, etc.). These vehicles run on petrol, diesel, CNG, LPV, and electricity.

3.2.3 Liquids not used as energy sources (refrigerants)

- *Cooling plants and air conditioning systems*

The Paris-Charles de Gaulle and Paris-Orly airports are equipped with a chilled water network that feeds into the sites main buildings. These systems contain refrigerants. Some of the buildings are equipped with auxiliary air conditioning. It should be noted that some of the vehicles used by Aéroports de Paris also have air conditioning systems.

- *High voltage batteries*

The high voltage batteries found in the airports contain SF₆.

3.2.3 Marginal sources (less than 1% of total emissions)

Two marginal sources were not taken into consideration when calculating an airport's total emissions, due to the very low levels of CO₂ produced by these sources.

Rainwater management

Aéroports de Paris manages rainwater, which is collected from the run-off from waterproofed surfaces. Retention ponds are used to store water at the sites until it is processed. The substances present in the water during the winter (melted snow) have a high biodegradability index.

They are processed at the Paris-Charles de Gaulle and Paris-Orly sites by Storm Water Treatment Plants before being discharged into the natural environment if the water quality meets the regulatory standards set by a specific inter-prefectural order. Aéroports de Paris has three treatment plants- one at Paris-Orly and two at Paris-Charles de Gaulle.

Green waste management

A green waste composting site was opened in 2004 at Paris-Orly and in 2010 at Paris-Charles de Gaulle. These facilities are not designed to be "industrial" green waste sites, and the volumes of finished products do not exceed 365 tonnes per year.

3.3 Indirect emission sources associated with energy (off-site)

3.3.1 Purchasing electricity

Airports are powered with electricity for their operations by external suppliers. On the sites themselves, the electricity network is the property of Aéroports de Paris.

3.3.2 Purchasing heating

The Paris-Orly airport recovers overheating water produced by the waste incineration plant located in the Rungis International Market. This heating makes it possible to limit the use of boilers in the on-site thermal plant.

4 - INVENTORY OF EMISSIONS

In accordance with article 75 of law no. 2010-788 of 12 July, the following table gives the CO₂ emissions of the various emission sources listed above. The regulations do not require emissions to be verified by a third party. However, Aéroports de Paris appointed an external body that specialises in the verification of emission inventories (DNV) for the year 2011. The aim of this was to check that all the sources had been taken into account and to validate the results obtained.

The names of the emissions are given below:

Emissions category	No.	Emissions source
Direct GHG emissions	1	Direct emissions from stationary combustion sources
	2	Direct emissions from mobile sources with thermal motors
	3	Direct emissions from processes excluding energy production
	4	Direct fugitive emissions
	5	Emissions from biomass (soil and trees)
Indirect emissions associated with energy	6	Indirect emissions linked to electricity usage
	7	Indirect emissions linked to the usage of steam, heating or cooling

		GHG emissions (in tonnes)					
		Reporting year 2013 -Create as many gas columns as necessary-					
Emissions category	Emissions source	CO2 (tonnes)	CO2 b (tonnes)	CH4 (tonnes)	N2O (tonnes)	Other gas: (tonnes)	Total (TCO2e)
Direct emissions	1	46 151					46 151
	2	3 379					3 379
	3					2 004	2 004
	4						
	5						
	Subtotal		49 531	-	-	-	2 004
Indirect emissions associated with energy	6	30 236					30 236
	7						
	Subtotal		20 236				30 236

Law Grenelle summary table for Aéroports de Paris SA

		GHG emissions avoided (in tonnes)
		Reference year (and first reporting year)
Emissions category	Sources	Total (TCO2e)
Direct emissions	1	47 176
	2	
	3	
	4	
	5	14 925
Indirect emissions associated with energy	6	
	7	3 611

Avoided emissions for Aéroports de Paris SA

Besides the strict regulatory requirements, Aéroports de Paris has also attempted to summarise the emission sources depending on the different airports within the scope of the report.

The following table breaks down the emissions by site.

Emissions category	Emissions source	CDG	Orly	Le Bourget	GAA	Raspail	Total (TCO2e)
Direct emissions	1	29 415	12 243	4 235		259	46 151
	2	1 903	1 211	265			3 379
	3	1 839	166				2 004
	4						-
	5						
	Subtotal						-
Indirect emissions associated with energy	6	22 931	6 677	484	75	68	30 236
	7						
	Subtotal						-

Emissions category	Sources	Total (TCO2e)	
		CDG	ORLY
Direct emissions	1	47 176	47 176
	2		
	3		
	4		
	5	14 925	14 925
Indirect emissions associated with energy	6		
	7		3 611

Simplified table of avoided emissions by site

Legend

- 1: refers to cogeneration emissions at Paris-Charles de Gaulle airport.
5: refers to wood-fired boiler emissions at Paris-Charles de Gaulle.
6: refer to emissions related to overheated water, generated by and coming from the Rungis waste incineration plant.

The overall uncertainties for each of the emission sources are presented in the following table.

SCOPE	Emission source	Uncertainty of the data and emission factor
Scope 1	Thermal power plant	5%
	Emergency generator	6%
		7%
	Service vehicles	5%
	Petrol - Diesel	10%
	LPG	
	Refrigerants	30%
Scope 2	Purchasing electricity	10%
	Purchasing overheated water	30%

Comparison between 2011 and 2013

The emissions in 2013 were compared with those from 2011. A reduction of 3,822 tonnes of GHG emissions was observed.

		GHG emissions (in tonnes)						Difference between reference year and reporting year (TCO2e)
		Reporting year 2013 -Create as many gas columns as necessary-						
Emissions category	Emissions source	CO2 (tonnes)	CO2 b (tonnes)	CH4 (tonnes)	N2O (tonnes)	Other gas: (tonnes)	Total (TCO2e)	2011
Direct emissions	1	46 151					46 151	50 154
	2	3 379					3 379	2 898
	3					2 004	2 004	1 859
	4							-
	5							-
	Subtotal	49 531	-	-	-	2 004	51 535	54 911
Indirect emissions associated with energy	6	30 236					30 236	30 681
	7							
	Subtotal	30 236					30 236	30 681

5 – OUR ACTIONS FOR MINIMISING THESE EMISSIONS

As a major stakeholder in the development and organisation of the Île-de-France region, Aéroports de Paris wants to hold itself up as exemplary and ambitious in the field of environmental protection. This decision is based on the company's approach towards obtaining ISO 14001 certification for its airports, which reflects its commitment to sustainable development.

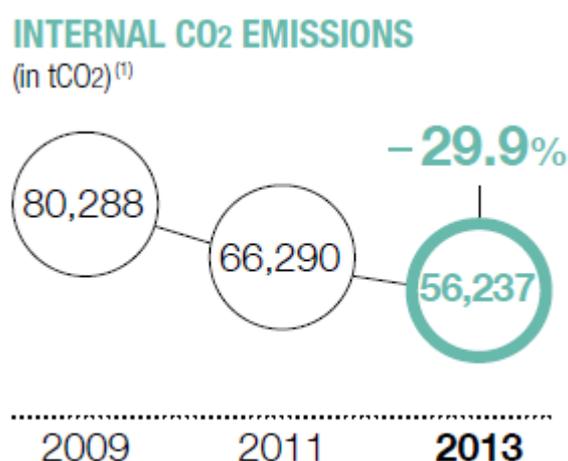
Strategic plan for 2011-2015

Given that a sustainable development policy has long been a component of the Aéroports de Paris general policy, sustainable development and corporate social responsibility have become fully integrated into the company's strategy. Aéroports de Paris wishes to reinforce its good practices in this field, and aims to become the European leader in terms of sustainable development and social responsibility.

Aéroports de Paris has pledged to reduce its internal CO₂ emissions by 25% between 2009 and 2015, with two drivers:

- reducing the internal primary energy consumption per square metre in buildings by 12.5%
- meeting 15% of internal final consumption using renewable energy sources.

Our internal energy consumption emissions fell by 29.9% in 2013 compared to 2009, with our target being 25% by 2015.



(1) according to 2011 data from the *Syndicat national du chauffage urbain et de la climatisation urbaine* (National Union for Urban Heating and Air Conditioning).

5.1 We are improving the performance of our energy production processes (at our thermal power plants and emergency generators)

A thermal power plant at Paris-Orly: 2011

From the beginning of the year, a part of Paris-Orly airport and the future Coeur d'Orly area is powered by a 10 MW geothermal power plant. This facility extracts hot water from the Dogger aquifer at depths of 1,700 m, and uses it to heat the connected airport facilities. At full capacity, it is able to save 3,600 tonnes of oil equivalent and reduce yearly CO₂ emissions by 9,000 tonnes.

The wood-fired boiler at Paris-Charles de Gaulle: 2012

Aéroports de Paris decided to power the Paris-Charles de Gaulle heating network using wood energy. Installed at the airport, a biomass plant will be in operation and generating heat from the end of 2012 by burning woodchips, by-products from the logging industry and collected less than 50 km away from the airport. This initiative is part of the support policies for using heat from renewable sources as implemented by the ADEME and the Île-de-France region.

This facility will be the biggest producer of renewable energy for Aéroports de Paris. 78,000 MWh of thermal energy will be produced every year, thus saving 18,000 tonnes of CO₂ emissions annually.

By 2013, the proportion of Aéroports de Paris' final consumption coming from renewable sources is 14%.

Boiler performance at Paris-Charles de Gaulle and Paris-Orly: 2011

In 2010, newer and more energy efficient boilers were also installed at Paris-Charles de Gaulle airport. These new boilers make it possible to reduce energy loss. New boilers with a higher performance and a total power of 25 MW, using a mixture of gas and fuel oil domestique (FOD), were delivered in 2011 to the Paris-Orly site.

The chilled water plant at Paris-Le Bourget: 2011

A shared air conditioning network is installed at the Bourget site. This chilled water plant starts to provide shared air conditioning to all connected buildings from the start of August.

The S4 thermorefrigerating pump: 2012

A thermorefrigerating pump is installed for the heating and cooling of Satellite 4 at Paris-Charles de Gaulle. This system makes it possible to generate hot and cold at the same time, from electricity. Its excellent thermodynamic efficiency offers potentially enormous energy savings compared to conventional heating and air conditioning systems. Such a system is very useful when a building requires heating and cooling at the same time, as is the case for

an airport terminal. The gas saved by this equipment leads to a reduction of 1,600 tonnes of CO₂ emissions every year.

Solar energy

The roof of the Paris-Orly intercompany restaurant is equipped with thermal solar panels, covering a total surface area of 72 m².

Automatic streetlights equipped with wind generators and photovoltaic solar panels are installed along the pathway linking Orlytech to the neighbouring RER station.

A thermodynamic solar water heater has been put in service at Paris-Le Bourget, used to provide hot water to the fire-fighting unit. This system helps reduce CO₂ emissions by 280 kg every year.

In 2013, a solar farm was built near to the Paris-Charles de Gaulle Environment & Sustainability Centre. This installed power of over 190 kWp will produce 167,530 kWh of electricity over the first year of operation, thus reducing carbon emissions by 3 tonnes per year.

Green electricity

A third of the electricity we used in 2013 came from renewable sources.

Aéroports de Paris has subscribed to an offer from GDF Suez, whereby the company pledges that 30% of the electricity it supplies us comes from renewable sources in France.

This commitment takes the form of green certificates that verify that this 30% comes from hydroelectric power stations, and has been renewed for the year 2014.

5.2 We are reducing our energy usage

Steps to limiting energy usage in our facilities

Certain energy usage reduction measures have seen us be granted energy saving certificates.

Aéroports de Paris is developing technical solutions to reduce energy consumption in its terminals. At Paris-Charles de Gaulle, a new lighting management system has been put in place. In 2010, the discharge lamps in terminal 2C at Paris-Charles de Gaulle airport and all of the security lighting at the Orly west and south terminals were replaced by LEDs.

Coming soon to all terminals

At Orly west, the display screens switch off automatically when the airport is closed.

At Orly south, the conveyor belts no longer move continuously, but only when baggage has been placed on them.

Computers

The increasing number of workstations and neglect of basic energy saving measures means that the company's computer network may be using more electricity than before. To bring this under control, Aéroports de Paris has launched its *Green IT* programme. This calls for better usage of computer equipment, the use of more energy-efficient technology, the implementation of adapted IT infrastructure, and the design of efficient data centres.

5.2 Actions with regards to sustainable construction

Aéroports de Paris has committed towards constructing buildings with the lowest possible impact on the environment. This high-quality environmental approach, associated with ambitious energy efficiency targets, is incorporated into all construction or major renovation projects. This commitment started off with terminal 2G, the work on which constituted the pilot phase of the High Environmental Quality (HQE®) policy.

Satellite S4 at Paris-Charles de Gaulle: 2012

With Satellite 4, the terminal 2E departure lounge, starting operations in June 2012, Aéroports de Paris is working towards setting the global benchmark for the airport industry in terms of sustainable construction. This building has been given a high energy efficiency and environmental performance target to reach. It must consume 20% less energy during ordinary operations than the global average of existing airports. This performance will be assured through an optimised building envelope and energy-efficient and energy-saving heating and cooling equipment.

Works Council Building at Paris-Charles de Gaulle: 2011

Opened in June 2011, the new building devoted to the Works Council is the first HQE-certified tertiary building that Aéroports de Paris has ever constructed. The heating and air conditioning systems use a reversible heat pump and underfloor heating and cooling. The green roof terraces help drain rainwater and insulate against noise.

Upcoming iconic projects at Paris-Charles de Gaulle and Paris-Orly

Designed by the company's architects and engineers, the future Aéroports de Paris head office will be HQE®-certified. It will be located close to public transport hubs that serve the airport (RER, the future CDG Express station, etc.). It is scheduled for completion in 2016.

The "New Beginning" project for Paris-Orly envisages the construction of a connecting building between the Orly south and Orly west terminals, a new international departure lounge, and a complete reorganisation of the space around the terminals.

Building on the experience we gained with the last terminal completed at Paris-Charles de Gaulle, Aéroports de Paris is aiming towards HQE® certification.

In addition to high environmental and energy performance, the priority targets for this certification include maintenance, waste management and sanitary water quality.

Energy usage diagnosis of the Paris-Orly buildings

An energy map of the buildings outside the terminals at Paris-Orly has been drawn up. The aim of this is to establish an Energy Efficiency Diagnosis for each building, and thus prioritise which buildings to renovate first from an energy savings point of view.

5.3 Reduction measures concerning vehicle emissions

The acquisition of electric vehicles: 2012 to 2015

For several years, Aéroports de Paris has been acquiring cleaner commercial and light-duty vehicles.

Aéroports de Paris has agreed to order almost 200 electric vehicles, as part of a vast call to tender launched in 2010 by more than 20 public companies and local authorities, and managed by the French postal service La Poste. These vehicles will be delivered in batches between 2012 and 2015.

Aéroports de Paris has a rolling acquisitions programme for a fleet of cleaner vehicles. Vehicle energy usage is monitored on a quarterly basis, and is fed up to the Aéroports de Paris Executive Committee as an indicator.

5.4 Actions with regards to awareness-raising

Aéroports de Paris has launched internal and external awareness campaigns in order to:

- educate company employees about the environment, the Group's environmental policy, and the current environmental situation of the airport sites;
- keep stakeholders informed of the actions carried out by the airports with regards to environmental protection;
- organise week-long events for airport employees and passengers (such as sustainable development week, European mobility week, and European waste reduction week).