

Environmental Statement 2008



**Hamburg Airport**

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Foreword

Dear Readers,

The fourth complete Environmental Statement will provide you with information on both our environmental activities to date and planned future activities. As an inner-city airport, Hamburg Airport has long been committed to structuring its commercial development in such a way as to avoid increased environmental impact. This is only possible when environmental protection is well organised and taken seriously.

Hamburg Airport is in the closing phases of its HAM 21 Expansion Programme. The airport is well prepared for the future and has completed the transition to a modern, international airport. Both past and future environmental programmes show that sufficient consideration has been paid to environmental concerns throughout these developments. The renewed certification of our environmental management system according to both European and international standards demonstrates that our commercial operations are not conducted at the expense of the environment. The commitment of the Hamburg Airport Group in the field of environmental management is a clear expression of the declared goal of achieving the best possible environmental conditions for an airport site. It also makes clear how seriously Hamburg Airport takes the needs and demands of the surrounding neighbourhood, for example in relation to noise protection. The reduction of aircraft-related noise thus continues to be an important issue for the airport.

Environmental protection, of course, is something that has to extend beyond the boundaries of the airport site. Hamburg Airport is therefore actively involved in a whole row of environmental projects in the City of Hamburg, including the



Michael Eggenschwiler and Claus-Dieter Wehr

voluntary climate protection programme of Hamburg corporations and the Hamburg Hydrogen Initiative.

The Hamburg economic region depends on a diverse and well-functioning range of different transport and traffic options. The operation of an effective airport is a key element in this. In this sense, and also by creating and maintaining long-term sustainable jobs on-site, Hamburg Airport sets the standard when it comes to contributing to the economic success of the region. We are convinced that sound environmental protection will be an important factor in maintaining this success in the future.

Michael Eggenschwiler
CEO
Flughafen Hamburg GmbH

Claus-Dieter Wehr
Managing Director
Flughafen Hamburg GmbH

Organisation and Activities



Hamburg Airport is Germany's fifth-largest international commercial airport. It has a significant place in the greater Hamburg region in terms of the creation of long-term employment. Approximately 12,000 people are employed at the airport site, 1,612 of them by FHG and its subsidiaries. The airport, together with Lufthansa Technik AG and EADS Airbus, contributes to Hamburg's status as the world's third-biggest player in the civil aviation sector.

FHG and its mission

FHG and its subsidiaries form the Hamburg Airport Group (see organigram on page 6) The Group carries out all the activities needed to maintain airport operations and to handle aircraft movements. As the airport owner, FHG provides the necessary physical infrastructure – terminals, aprons, runways, illumination and navigation facilities, etc., and ensures the continuous operability of this infrastructure. FHG also assumes all the necessary administrative responsibilities for the Group and sets the Group's guidelines. FHG's responsibilities are fulfilled by several business units (e. g. aviation, real estate management, marketing, commercial services, human resources, occupational health and safety) and central administrative units (including controlling, environmental protection, legal affairs). As the owner of buildings and thus as landlord, FHG provides the necessary buildings, equipment and facilities for energy and water supplies and monitors and maintains these services.

The activities of the Hamburg Airport Group are extremely varied. They are, however, essential for effective airport operation. As the various associated work processes have varied relevance for

the environment, these processes and the business units and companies responsible are presented below.



Hamburg Airport – aviation service provider

Ground traffic services

Ground traffic services on the apron are carried out and coordinated by FHG's subsidiaries.

Transport services

Baggage and cargo have to be transported from the terminals to the aircraft parking positions and loaded into aircraft (and vice versa). These services are provided by GroundSTARS, the largest subsidiary in terms of personnel, with approximately 300 employees. Diesel generators are taken to the remote parking positions, which are not equipped with jetbridges, to provide aircraft with electricity.

Passengers travel between the terminals and aircraft parked at these remote positions by apron

Organisation and Activities

bus. This transport service is provided by the STARS subsidiary, which has some 100 employees. Aircraft parked at positions on the Passenger Pier cannot leave their parking positions under their own power, as they have to move in reverse. They are pushed back from the parking positions with special aircraft tugs, until they are able to move under their own power. This service is also provided by STARS.

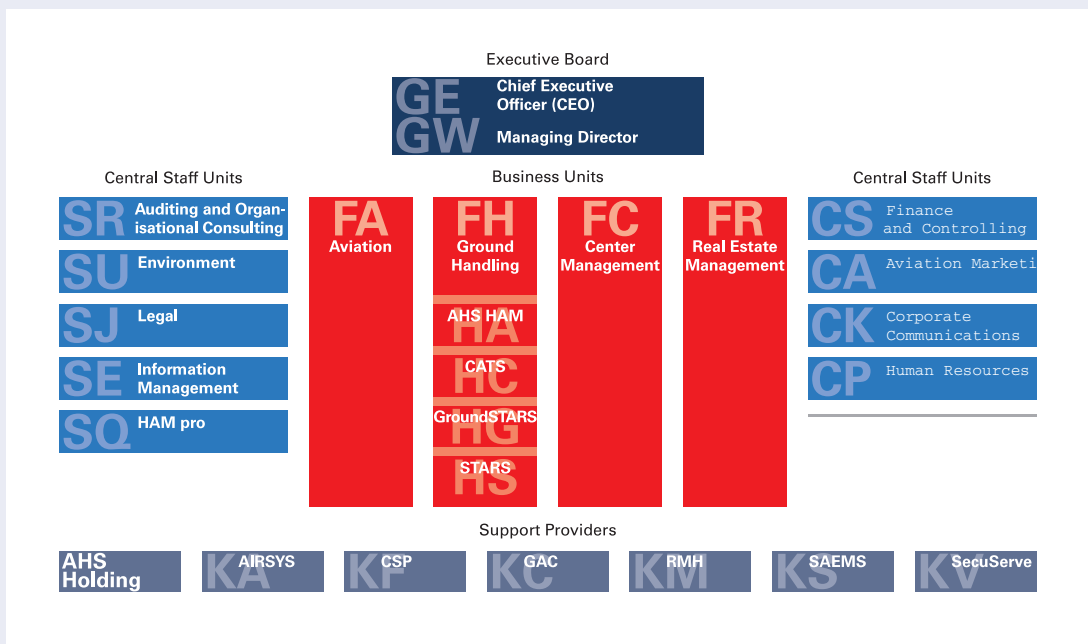
Aircraft cabin cleaning

Waste from aircraft cabin cleaning is transported to a waste collection point, exclusively for cabin cleaning waste, by vehicles especially equipped for the purpose. This collection point is located close to the southern Apron 1. The approximately 70 employees of the subsidiary CATS provide cabin cleaning services. It is typical of the vehi-

cles operating on the aprons that they are only ever used for short distances. There are also more or less lengthy pauses between trips.

Aircraft de-icing

On some days in winter the aircraft have to be de-iced or preventively protected against the formation of ice on their outer surfaces. This measure is necessary for aviation safety, as ice or snow can have a detrimental effect on both the aerodynamic lift characteristics and the weight of the aircraft. De-icing is carried out using special vehicles, known as “elephants”. De-icing fluid is manually sprayed onto the aircraft from these vehicles. The quantity of de-icing fluid used depends essentially on the weather conditions and the size of the aircraft being de-iced. The STARS subsidiary is also responsible for de-icing aircraft.



Organisational structure of Flughafen Hamburg GmbH and its subsidiaries

Maintenance

Large areas of the airport site are influenced by the many, various activities that support actual airport operations. The SAEMS subsidiary operates a vehicle workshop for the repair of all FHG vehicles. All work necessary for the repair and maintenance of vehicles is carried out at this workshop.

Most necessary maintenance work is carried out by the RMH subsidiary. Lighting material and equipment needed by the airport are stored and repaired in RMH's electrical workshop (or replaced on-site). The workshop staff are also required to provide emergency on-call service. The recharging station for traction batteries, located in the same building, has not been in operation since the deployment of natural gas-powered tugs. All metal components required, for example, in the terminals are constructed and/or repaired in the fitter's workshop. In the carpentry workshop, repairs and woodworking activities are carried out. The workshop operators normally also coordinate repair and maintenance work necessary throughout the entire airport site. Other maintenance operations are carried out by the structural engineering section, which is also responsible for mowing grassed areas in summer and clearing snow and ice from aircraft movement areas in winter. Aprons, taxiways and runways are normally de-iced by removing snow from the ground and depositing it at a central snow dumping point. To avoid slippery surfaces, in particular on the runways, gravel of a certified fine granularity is scattered. The gravel only contains a small amount of de-icing granulate. If the surface is coated with an especially compacted snow or ice layer, a further combination of mechanical and chemical intervention is required.



Repair of a baggage tug in the vehicle workshop of FHG subsidiary SAEMS



Apron lighting check

Internal waste disposal

The disposal of waste generated at the airport site is centrally coordinated by the Caretaker's Department and the Centre for Environmental

Organisation and Activities



Snow clearance in the aviation operation areas is primarily mechanical



In the coming years, the energy efficiency of the airport's data centre will be examined

Protection. A fundamental aspect is the differentiation between commercial waste and hazardous waste (see Glossary). Commercial waste (paper, packaging, residual waste, etc.) is generated in all buildings. The greatest quantities of

commercial waste occur in the terminals. In contrast, so-called hazardous waste – formerly known as “waste requiring special monitoring” – is primarily generated in the workshops and through the operation of the energy supply facilities.

Other services

The support of FHG's telephone and computer networks is the core business of AIRSYS, FHG's IT service provider. Small subsidiaries such as GAC (consulting services), CSP (accounting-related financial services) and SecuServe (security services) pursue their activities at the airport.

Activities outside the Hamburg Airport Group

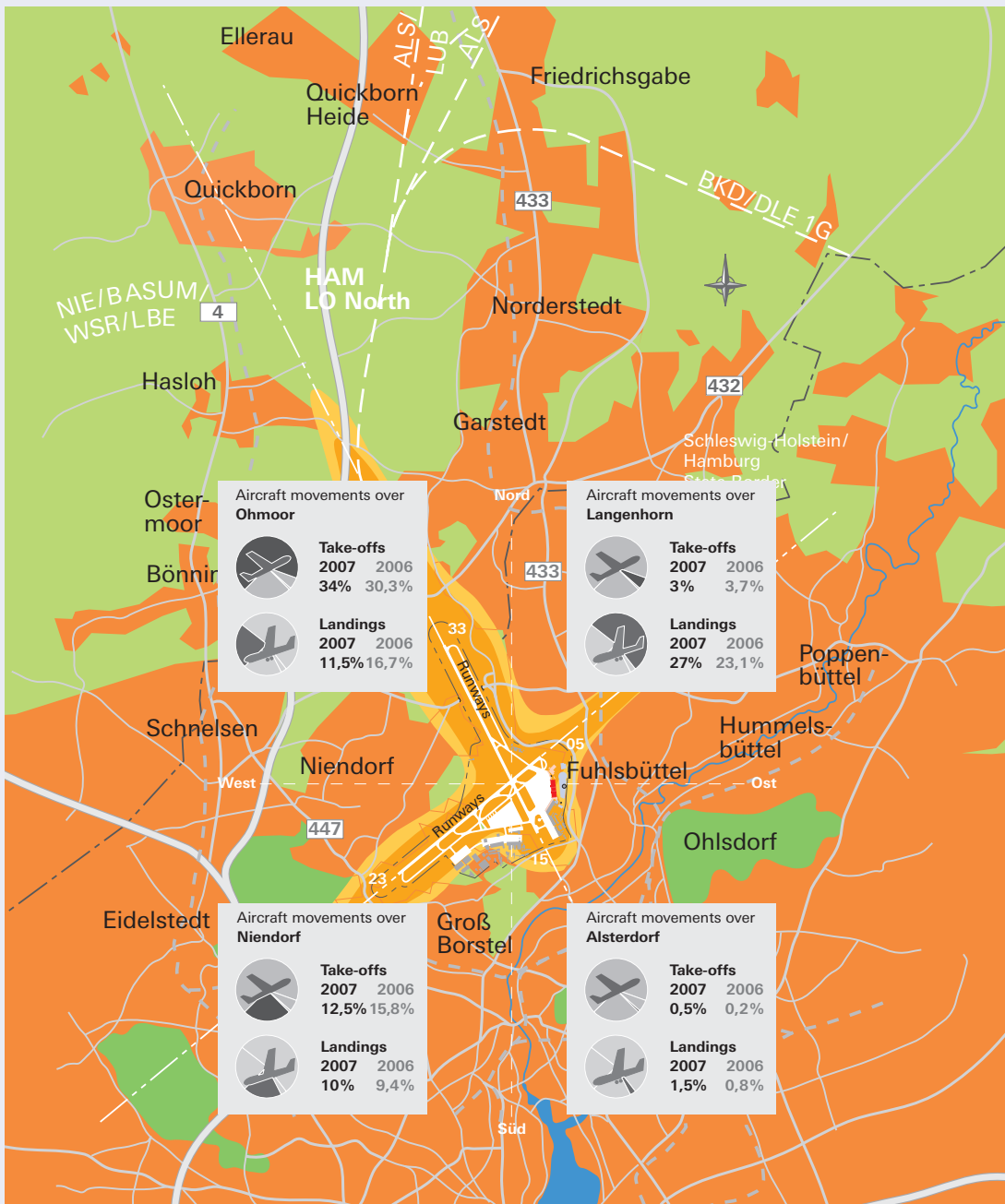
A whole row of further activities on the apron are not carried out by organisations within the Hamburg Airport Group. This includes, for example, the refuelling of aircraft. As the airport, for environmental and other reasons, refuses to allow the installation of fuel pipes underneath the apron, aircraft refuelling is conducted using tanker vehicles. The tankers are filled with kerosene at the tank farm and then transport this kerosene to the individual ground handling positions, where the tanker drivers then refuel the aircraft.

Air traffic at Hamburg Airport

The most obvious activity at an airport is most certainly air traffic. Flughafen Hamburg GmbH's Environmental Protection Centre considers this area to be especially important (see also page 21).

The aircraft noise generated by air traffic has a great impact on neighbouring residents. The following types of aircraft movement are relevant:

- Take-off and landing of aircraft, including climb and approach phases, over residential areas



Average distribution of take-offs and landings over the four available operating directions

Organisation and Activities

- Taxi manoeuvres on the taxiways to and from the terminals

In order to facilitate air traffic to and from Hamburg, FHG provides runways and the associated illumination and navigation facilities. German Air Traffic Services ("Deutsche Flugsicherung" or "DFS") is responsible for airborne air traffic.

2007 saw an average of 14,200 aircraft movements per month, or 350 aircraft movements per day. The irregular distribution of flights, however, results in peak periods. The busiest six months are between the beginning of May and the end of October.

The most common types of aircraft used in scheduled traffic to and from Hamburg are small to medium-sized aircraft. These aircraft have a capacity of up to almost 200 passengers. Recent years, however, have shown that smaller aircraft are replaced by larger aircraft on some routes.

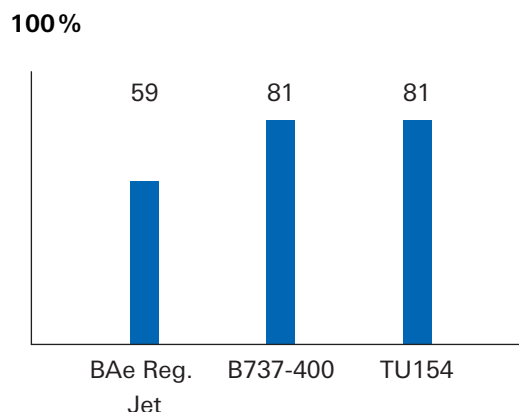
A characteristic aspect of aircraft movements at Hamburg Airport is the intersecting take-off and landing system resulting from the simultaneous use of both runways. This configuration allows for the smooth coordination of air traffic with a range of wind directions. This is appropriate for Hamburg's high exposure to wind. This allows for four possible take-off and landing configurations (see diagram on page 9). Take-off and landing movements are assigned to these configurations in different proportions. This allows for the most densely populated areas in the airport vicinity to be protected from disproportional aircraft noise.

The most common aircraft types at Hamburg Airport

Type	Size*
Boeing 737-300	up to 150
Airbus A319-100	124-156
Airbus A320-200	150
Canadair Regional Jet	50-86
Boeing 737-800	Bis 189

* seating capacity

Mix of aircraft types Decline in use of older, louder aircraft in %



Engine test runs and APU operation

Important checks are carried out in the cockpit as part of ground handling. In many cases, cabin lighting must also remain switched on. Theoretically, an aircraft can provide the electricity for these operations itself. Almost every aircraft is equipped with an auxiliary power unit (APU, see Glossary). These auxiliary power units can be a major contributing factor in noise problems at an airport, in particular for people living directly adjacent to the airport. Assuming no measures

are taken to reduce APU noise, it is typically constant. It can also be experienced in the so-called "noise breaks", i.e. the periods when aircraft are not flying overhead. Measures taken by Hamburg Airport to reduce APU operation are described starting on page 25.

Engine test runs used to be a further source of surface noise. Since the commissioning of the noise protection hangar, however, the contribution in noise generation associated with engine tests is, for the most part, a thing of the past.

Important developments since 2005

Traffic development

Since the publication of the last Environmental Statement in 2005, traffic at Hamburg Airport has increased significantly (see chapter "Hamburg Airport in Figures"). This growth is particularly strongly reflected in the growth in passenger numbers. The number of aircraft movements also increased, although less substantially. As a general trend, the size of aircraft used at Hamburg Airport is increasing. This results primarily from the fact that the airlines are replacing small aircraft with larger ones on many routes to adjust to increased passenger volume. To a more limited extent, the launch of new long-haul routes has also played a role here, as these routes are served by larger aircraft. The distribution of aircraft movements over the individual routes has not substantially changed in comparison to preceding years.

Developments in the legislative and political framework

Fulfilling legal requirements is a fundamental principle of environmental management. Legislative changes and new legislation therefore always impact Hamburg Airport Group's envi-

ronmental activities. Since the publication of the last Environmental Statement in 2005, the following changes in the legislative framework played a substantial role.



Auxiliary Power Units (APUs) are not needed during ground handling in Hamburg

Amendments to the Aircraft Noise Act

The Aircraft Noise Act ("Fluglärmsgesetz") was amended in July 2007. The amendments stipulate stricter criteria for the establishment of noise protection zones than the previous version of this act required. The noise protection zones for Hamburg Airport can be calculated as soon as the relevant calculation regulations have received parliamentary approval. This is not yet the case.

Implementation of the Directive on Environmental Noise

The EU Directive on Environmental Noise came into force as early as 2002. It has been implemented in German law, with relevance to airports, in the form of the Federal Immission Con-

Organisation and Activities



Medium-sized aircraft such as the Airbus A320 and the Boeing 737 family are typical of the traffic at Hamburg Airport

trol Act. The Directive requires that airports with more than 50,000 aircraft movements per year (take-offs and landings) produce strategic noise maps and noise action plans.

Strategic noise maps have been produced in recent years and are available. The action plans are currently being produced. In contrast to the Aircraft Noise Act, the implementation of this directive is not the responsibility of Flughafen Hamburg GmbH. The Department of Civil Engineering and the Environment (BSU) is responsible for the directive within Hamburg, including the airport. Interested parties may obtain further information and view the strategic noise maps on the web pages of the BSU, the City of Norderstedt and the City of Quickborn.

Guideline on the Energy Performance of Buildings

The EU Directive on the Energy Performance of Buildings, which came into effect in 2005, has also been very important for FHG because of the many new buildings constructed on the site. The directive contains specifications and a limited range of threshold levels, in order to guarantee the lowest possible energy consumption for the heating and air conditioning of buildings.

Since the Electrical and Electronic Equipment Act came of March 2005, the manufacturers of electrical and electronic appliances have a wide-ranging obligation to take appliances they have made back for disposal, when these appliances entered circulation after August 2005. Although this law is primarily intended to impact on private households, it will also have consequences for Flughafen Hamburg GmbH's waste disposal activities in the future: even small electrical equipment must be collected and disposed of separately.

Discussion on the emission of greenhouse gases

The discussion on the emission of greenhouse gases, in particular carbon dioxide (CO₂), is a

major issue at present. Measures to reduce CO₂ emissions at Hamburg Airport will form an important focal point of the new Environmental Programme, so as to revitalise the focus on climate protection. The existing legislation on emissions trading, of course, also apply to the airport. Additional discussions are currently taking place on the inclusion of aviation itself in emissions trading. Although this will primarily affect airlines, airports will also be required to make a contribution to the reduction of greenhouse gas emissions.

New buildings and facilities & decommissioning older buildings

The airport's appearance has changed significantly over the past three years. Terminal 1, which entered service in June 2005, has been a decisive factor in this development. The old Terminal 1 was decommissioned. It is now used as an event location. The total floor surface area in use at the airport grew by approximately 47,000 m² as a result of this construction project. This growth in floor area alone created an increase in energy requirements which cannot necessarily be compensated for simply by using more modern and energy-efficient air conditioning equipment in the new terminal.

In January 2006 the old Terminal 3 was demolished and the construction of the Airport Plaza began. The Plaza will enter operation in November 2008. The demolition and construction phases resulted in the generation of construction waste and increased energy consumption (construction heating). In the future, the operation of this building will mean a further 33,000 m² increase in the floor surface area of the airport in use, and the total energy requirement will also rise. Measures from the previous Environmental Programme 2005–2008 are designed to counteract this expected increase (see pages 36–37).

Smaller modifications were carried out on the former vehicle hangar G, which until recently served as a garage for ground handling service buses. Since March 2007, the hangar has been used for parking and maintaining aircraft.



Recent years have been characterised by the construction of new buildings

Operational Environmental Protection and Environmental Management



Environmental impact and operational environmental protection

The majority of activities carried out on the premises of Flughafen Hamburg GmbH make it necessary for the airport to address a whole row of environmental impact issues. The environmental aspects that must be considered are, in essence, presented in the table on page 16.

The Environmental Protection Centre (SU) was established in 1989 to ensure that the operation of the airport takes environmental issues into consideration. The Centre's responsibilities consist of:

- providing up-to-date information on environmental law
- advising on new technological concepts and measures in environmental protection
- carrying out or commissioning analyses and measurements of environmental quality on-site
- appointing compliance officers for waste, water protection, hazardous goods and radiation protection as well as for environmental management.

All departments and business units have an important role to play in the implementation of environmental measures, thanks to their specialist knowledge and practical experience. They ensure an optimal operative implementation of new concepts. Last but not least, all employees do their best to ensure that their work is performed in as environmentally friendly a way as possible.

The healthy and effective cooperation between the various departments and business units on the one hand and the Environmental Protection Centre on the other hand is an important factor

in ensuring that Flughafen Hamburg GmbH and its subsidiaries have a minimal impact on the environment.

Environmental management

Environmental management forms the basis for practising environmental protection in the most systematic and goal-oriented way possible. Operational environmental protection is the responsibility of the highest management level, the Executive Board. The most important prescribed target is the observation of all environmental regulations that apply to the airport. All programmes and investments in environmental protection should lead to a reduction in environmental impact or enable future growth to occur without increasing environmental impact.



Airport operations take into account all aspects of environmental impact

The environmental management system is part of the overall management system and establishes the organisational structure and process-

Operational Environmental Protection and Environmental Management

Overview of the most important direct and indirect forms of environmental impact occurring on site

Environmental impact	Type of impact	Cause	Responsible business unit
noise	indirect	aircraft taking off and landing, aircraft taxiing, aircraft ground handling operations	FHG (airlines), GroundSTARS
release of air pollutants	indirect	aircraft, ground handling vehicles, FHG surface vehicles, internal energy and heat generation	FHG, GroundSTARS, CATS, STARS, RMH, AIRSYS
resource consumption (fuels, drinking water)	direct	vehicle use, supplying water to aircraft, hygiene facilities, de-icing of surface areas and aircrafts, operation of the BHKW and Central Heating Plant	FHG, RMH, CATS, GroundSTARS, STARS, SAEMS, AIRSYS
energy consumption	direct	all electricity consumers (e. g. illumination of aprons, buildings, etc., air conditioning & heating of buildings)	all business areas, FHG tenants
generation of waste water	direct	surface water on the aprons, sanitary facilities, workshops, de-icing	FHG, RMH, STARS, SAEMS
generation of waste	direct	commercial waste in all areas, esp. in retail and restaurants in the terminals, hazardous waste in workshops	all business areas, esp. SAEMS, RMH, AIRSYS, FHG, tenants of FHG
landscaping consumption, usage of and impact on green spaces	direct	construction facilities, aviation safety regulations	FHG, RMH, tenants of FHG

es for the implementation of a corporate environmental policy. In 1998, Flughafen Hamburg GmbH introduced an Environmental Management System, which was tested and certified according to international standards in 1999, both in terms of the European Union's Eco-Management and Audit Scheme (EMAS) and the internationally applicable ISO 14001 standard. Three new certifications have taken place since.

FHG is committed to providing the general public with extensive information by means of an externally audited Environmental Statement, which must be published as a complete and thorough edition every three years. The most important elements in the Environmental Management System are:

- the creation of an environment policy by the Executive Board (Environmental Guidelines)
- systematic surveys of environmental impact issues
- development of environmental goals based on these surveys
- regulation of environmentally relevant operational procedures and the implementation of planned measures
- regular monitoring by in-house personnel and, in the case of an external certification of environmental management, external auditors
- annual evaluation accompanied by planning of measures for improvement

Facility safety and preventive measures

The regular inspection of all environmentally relevant facilities and operational areas is an important element in environmental management for Flughafen Hamburg GmbH. Facilities storing water hazardous or flammable materials are regularly inspected. Any faults identified are dealt with as quickly as possible. Maintenance and inspection work is carried out by trained per-

sonnel from the subsidiary company RMH. Where necessary, certified, external specialist firms also undertake these tasks.

Preventive environmental protection also has to include measures to deal with emergencies and accidents, which may lead to environmental damage. Quick and effective response is achieved in such situations by ensuring that those persons listed in the emergency plans are notified in the order necessary for effective damage limitation. Depending on the severity of the situation, corporate compliance officers for water protection, hazardous goods and radiation protection may be informed so as to be able to undertake counteractive measures on-site.



The fire brigade is responsible for emergency planning

Flughafen Hamburg GmbH's site fire brigade plays a central role in the security and safety plan. The brigade's staff have been trained for this type of deployment and are in possession of the necessary equipment. The fire brigade's 24-hour service ensures that there are sufficient personnel on site for damage control operations at all times.

Operational Environmental Protection and Environmental Management

Environmental Guidelines

The Environmental Guidelines, published as early as 1998, represent FHG's mandatory environmental policy. Hamburg Airport's environmental policy guidelines clarify the airport's principles of operational environmental protection..

Environmental protection is a component of our corporate strategy.

As far as possible, we avoid environmental pollution. We use energy and raw materials sensibly and as economically as possible. We seek to influence our customers and contractual partners in accordance with this goal.

We protect the environment beyond the level required by law.

We observe all legal requirements. As an innovative, environmentally conscious company, we desire to reduce environmental pollution associated with the operation of the airport in excess of legal requirements.

We are all responsible for the environment.

We promote consciousness of environmental responsibility on site at Hamburg Airport. We encourage every employee to make suggestions for the improvement of environmental protection, either within the framework of the company's employee suggestion system or by making direct contact with the relevant responsible persons.

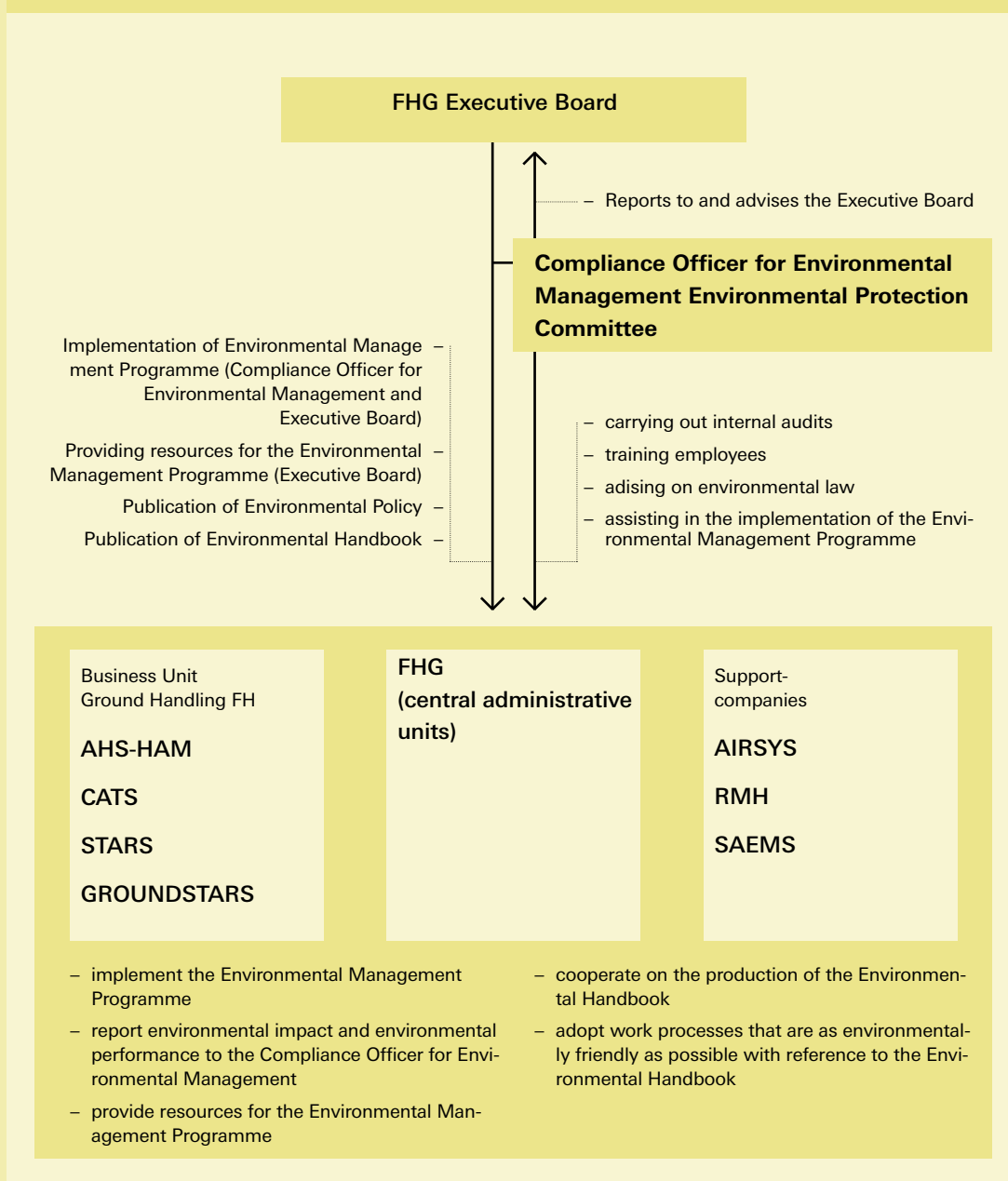
We see environmental protection as a process of continuous improvement.

We identify, document and evaluate those activities which have an impact on the environment in order to identify possibilities for improvement. We aim to make progress in operational environmental protection by providing thorough education and training to our employees. We set measurable targets for improvement in environmental protection.

We take into account the interests and needs of the surrounding area.

We engage in open and critical dialog with the general public. The general public receives information about our company's environmental impact, and we take its concerns, questions and criticisms seriously.

Structure of the Environmental Management System



The Environmental Management System for Flughafen Hamburg GmbH and its most important subsidiaries (from an environmental perspective)

Facilities, Operating Areas, Protective Measures



Air Traffic

Air traffic is not only the most important and obvious activity at the airport. The aircraft noise generated by air traffic has a significant impact on neighbouring residents, so that this area requires an especially high level of attention from an environmental protection perspective.

A whole row of measures has been put in place to counter aircraft noise. The most important goals are to reduce the noise produced by individual aircraft movements (active noise protection) and to improve the protection against noise (passive noise protection).

Passive noise protection

In order to protect the affected area around the airport from aircraft noise, FHG has for a long time been operating a range of voluntary noise protection programmes. These programmes are aimed at equipping residential buildings in the area affected by aircraft noise with noise-proof windows. In the programmes conducted since 1998, FHG has also offered to fit soundproof ventilators. These ventilators, fitted in bedrooms and children's rooms, are designed to ensure that fresh air is available through the night despite closed windows.

Active noise protection

Minimising aircraft noise emissions depends first and foremost on technical innovations in aircraft construction, resulting in the development of newer and lower-noise aircraft types. This, however, is the responsibility of aircraft manufacturers. Airports can only give limited impetus in the direction taken here by exercising indirect influence on airlines. The international nature of aviation makes bans on individual aircraft models very difficult to enforce. FHG therefore seeks to

make it more attractive for the airlines to deploy quieter aircraft in Hamburg. The graduation of landing charges, as has been practised in Hamburg for some time, has proven very effective: louder aircraft attract a significantly higher landing charge than quieter aircraft. The desired financial attraction of deploying quieter aircraft is achieved by making 30% of the landing charge depends on the model-specific noise emissions, as measured at two measurement points.



*Flight routes and noise measurement stations
Map courtesy of German Air Traffic Services*

As nighttime aircraft noise causes the greatest disturbance, strict restrictions on night flights have been in effect at Hamburg Airport for a long time. Since the restrictions were further strength-

Facilities, Operating Areas, Protective Measures

Flughafen Hamburg GmbH's Noise Protection Programmes

Valid from: 17.09.2008

Programme	Affected residences	Investment in million €	Ventilators installed
Completed programme			
Legally required programme	800	0,92	
1. Voluntary programme	1.600	4,09	
2. Voluntary programme	5.500	15,34	
3. Voluntary programme	3.000	7,41	
4. Voluntary programme	640	1,52	1.047
5. Mandatory programme	2.900	4,69	6.448
Totals up to and including fifth programme	14.440	33,97	7.495
Current programmes (resources available until 31.12.2010)			
6. Voluntary programme <small>(Compensation for noise levels in residential gardens > 67 dB(A))</small>	370	1,5	
6+ Voluntary programme <small>(Extended compensation for noise levels in residential gardens > 65 dB(A))</small>	560	0,38	
7. Voluntary programme <small>(Repair of soundproof windows from programmes zero and one (1978 – 1982) and installation, free of charge, of noise-proof ventilators in bedrooms and children's rooms)</small>	1.400	0,8	269
7+ Voluntary programme <small>(Extended repair of soundproof windows from programme two (1982 – 1986) and installation, free of charge, of noise-proof ventilators in bedrooms and children's rooms)</small>	2.200	0,23	130
8. Voluntary programme <small>Noise protection for the north (promotion of soundproof windows instead of singly glazed windows or insulating windows < 30 dB; installation, free of charge, of noise-proof ventilators in bedrooms and children's rooms)</small>	6.800	0,45 <small>(FHG contribution 3/6)</small>	249
Totals of programmes six to eight	11.330	3,36	648
Total (completed and current programmes)	25.770	37,33	8.143

ened in 2001, airlines have to pay a surcharge on the noise-related landing charge of either 100% or 200% for take-offs and landings late at night. This measure is designed not only to protect peace and quiet at night, but also to ensure that quieter aircraft are deployed for flights scheduled in the evenings.

The area surrounding the airport is built-up to varying degrees, so that there are regional differences in the number of people affected by aircraft noise. This is taken into account in flight route planning, so that the four operating directions for air traffic are, whenever possible, utilised in such a way as to provide maximum protection from aircraft noise for ambient residential areas.

FHG continuously measures noise generated by air traffic at 13 fixed monitoring stations. The monitoring network is operated by FHG's Environmental Protection Centre, where both noise measurements and noise calculations are carried out. Calculations are carried out regularly in order to ensure that the noise quota is observed. The noise quota is a limit on the level of noise generated annually by air traffic. The level of noise generated in 1997 is set as an upper limit which may not be exceeded. The noise quota is based on the surface area exposed to an energy-equivalent sustained noise level of 62 dB(A).

Further information on the noise quota and on aircraft noise measurements is available in FHG's annual aircraft noise report, available at www.ham.airport.de/en/c_environment_noise. At www.hamburg.de/fluglaermmessungen the City of Hamburg's Noise Protection Compliance Officer also provides – in co-operation with Hamburg Airport – thorough and detailed information on this subject.

Annual noise levels (L_{eq3}) at aircraft noise measurement points

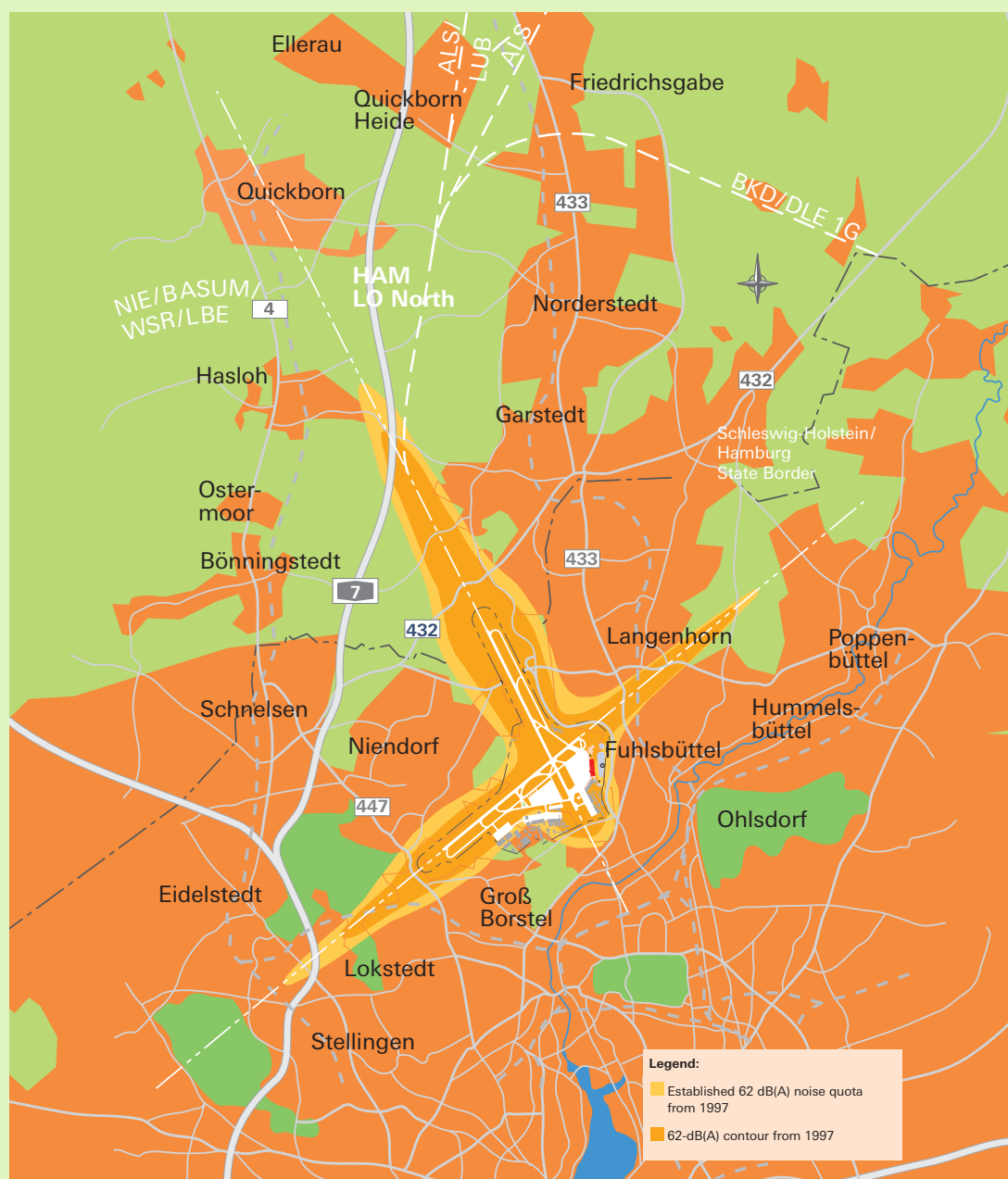
Measurement point	2005	2006	2007
1 Hasloh	51,3	50,1	55,4
2 Norderstedt	45,7	45,0	48,8
3 Quickborn	54,4	53,8	53,7
4 Norderstedt	52,5	50,3	52,4
5 Langenhorn	60,1	60,3	59,9
7 Fuhlsbüttel	62,9	62,8	63,8
8 Niendorf	56,0	55,8	55,6
9 Quickborner H.	49,1	48,2	48,9
10 Stellingen	59,3	59,2	60,2
11 Norderstedt	60,4	60,0	60,3
12 Groß Borstel	55,8	56,0	55,6
13 Poppenbüttel	54,2	54,5	55,4

(For more detailed data see Flughafen Hamburg GmbH's Aircraft Noise Report 22, April 2008)

Aprons and taxiways

The aprons are amongst the most characteristic and fundamental infrastructural elements of the airport. Apron 1 has a total of 41 aircraft handling positions, 17 of which provide direct access to the terminals via jetbridges. Apron 2 has 18 aircraft handling positions for commercial aviation along with a special area for general aviation. Both aprons consist of concrete with a depth of 35 cm. This depth and stability are an effective means of protection against substances that may pollute the soil or groundwater. Aside from the sealed surface area of 70 ha (Apron 1) and 40 ha (Apron 2), the primary environmental relevance of the aprons arises from the operational processes that take place on them.

Facilities, Operating Areas, Protective Measures



Prescribed noise quota from 1997 and relevant noise development for 2007

Vehicle operation

The vehicle fleets contribute to the generation of air pollution at the airport site, albeit to the relatively limited extent of 5 – 15%. Environmental measures thus aim to reduce these emission levels. Indirect environmental impact also arises from vehicles driving to the airport (landside), e.g. taxis, private vehicles, mini-buses, MPVs and buses, along with heavy goods vehicles involved in air freight.

In order to noticeably reduce the quantity of air pollutants generated by vehicle operation, the number of diesel and petrol (gasoline) vehicles deployed on the aprons is being continually reduced. More and more use is being made of alternative fuel systems. As part of the last Environmental Programme, for example, 27 natural gas-powered baggage tugs were acquired. Natural gas-powered passenger buses and operational vehicles of all types are also increasingly being deployed. The deployment of natural gas and hydrogen-powered vehicles is especially relevant for ground handling services due to the high level of vehicle usage.

APU substitution

APUs (see glossary) can for the most part remain switched off, as the airport provides aircraft with electricity and air conditioning during ground handling operations. This results in a reduction in a significant source of air (and noise) pollution. There are two different ways in which this takes

place at Hamburg Airport. At the pier positions, aircraft receive electricity and air conditioning from the block-type thermal power station. Air-

Fuel consumption (l) and associated CO₂ emissions (t) over the last three years

FHG subsidiary		2005	2006	2007
STARS	Fuel	502.645	1.002.834	439.134
	CO ₂	1.312	2.617	1.146
Ground-STARS	Fuel	778.359	735.442	491.642
	CO ₂	2.032	1.920	1.283
SAEMS	Fuel	2.630	2.930	2.627
	CO ₂	7	8	7
AIRSYS	Fuel	3.460	12.436	3.341
	CO ₂	9	32	9
CATS	Fuel	24.539	26.907	24.641
	CO ₂	64	70	64
RMH	Fuel	179.513	180.338	133.842
	CO ₂	469	471	349
FHG	Fuel	132.985	138.224	154.286
	CO ₂	347	361	402

craft parked at remote positions receive electricity from mobile diesel-powered generators (GPUs, or Ground Power Units). If the cabins of remotely parked aircraft require air conditioning, mobile equipment is available. Staff of the Environmental Protection Centre regularly monitor APU activity during aircraft ground handling to ensure that these facilities are actually used. Since 2005, the Airport Usage Regulations (FBO) have included an explicit mandatory ban on the use of APUs during ground handling, at both pier and remote parking positions; the staff member monitoring activity is thereby authorised, where

Facilities, Operating Areas, Protective Measures

necessary, to order the connection of the aircraft to the external electricity supply.

This measure has resulted in significant reductions to both air pollutant emissions and ground noise (see glossary). Since 2002, ground noise reduction has also been achieved by the use of

by so-called "elephants" (see pages 6 – 7). Snow is primarily cleared from the aprons, taxiways and runways with snowploughs and sweepers. To avoid slippery surfaces, in particular on the runways, gravel of a certified fine granularity is scattered. The gravel only contains a small amount of de-icing granulate. If the surface is coated with an especially compacted snow or ice layer, a further combination of mechanical and chemical intervention is required. Granulates of acetates or formiates are used for surface de-icing, as these are significantly more environmental friendly than the carbamides formerly used.

Waterway protection on the aprons is especially significant in light of the fact that the de-icing of aircraft on the aprons during the winter months results in the potential pollution of surface water with water-hazardous substances.

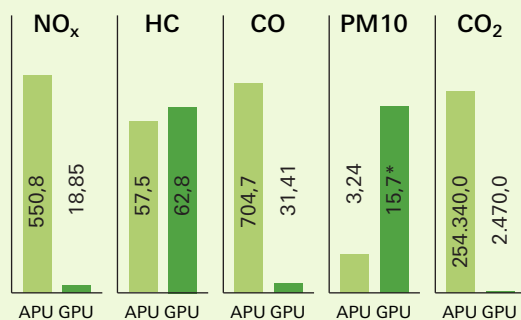
The chemicals used for aircraft de-icing consist of glycols (see Glossary).

These are mostly non-toxic and biodegradable, and therefore only minimally water-hazardous. The oxygen required for the biodegradation of glycols, however, can result in a significant reduction in oxygen levels in drainage catchments. If a glycol water level exceeding 50 mg/l is detected, the flow of water to drainage catchments is automatically stopped. The polluted water is stored separately and then fed via separate pipes to the municipal sewage treatment plant. Once the TOC measurements indicate that water from the aprons is no longer polluted, and all the polluted water has been diverted to the sewage treatment plant, surface water can once again follow the normal path to the drainage catchment.

The aim of these waterway protection measures is to prevent the entry of water-hazardous sub-

Emissions from Auxiliary Power Units (APUs) in comparison to Ground Power Units (GPUs)

Air pollution emission quantities [g/h]



* Retrofit of particle filters in GPUs planned for 2009/2010.

the noise protection hangar for aircraft engine test runs. The hangar, constructed by FHG, is now operated by Lufthansa Technik AG. The construction of this hangar has made it possible for even wide-body jets, up to the size of a Boeing B747-400, to undergo engine tests on the ground in an enclosed facility. The engine tests formerly conducted in the open air on FHG premises are, as a result, almost completely a thing of the past.

De-icing

Whilst surface areas (aprons, taxiways, runways) are primarily cleared of snow and ice by mechanical means, the de-icing of aircraft is performed

stances into the groundwater and into the Tarpenbek stream, which serves as a rainwater drainage catchment. A total of nine rainwater retention basins and rainwater purification basins serve primarily to ensure a controlled flow of surface water from the aprons into the drainage catchments. Furthermore, all rainwater retention basins leading to the drainage catchments are equipped to function as safety separators in accordance with RiStWag (see Glossary), so as to ensure effectiveness in the retention of hydrocarbons (kerosene, gasoline, oils, etc.) released in the event of an accident. Additionally, coalescence separators have been installed for the drainage of the aprons.

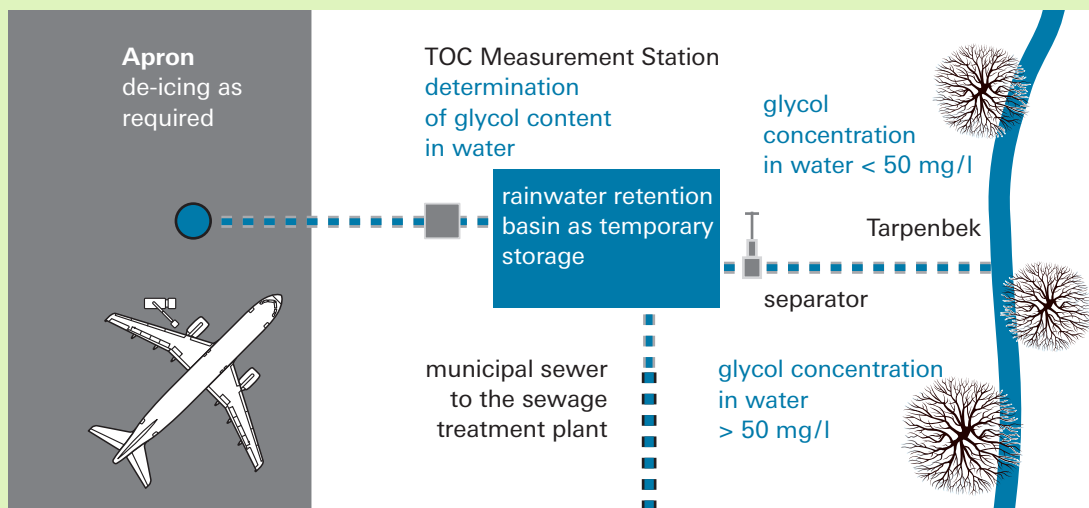


De-icing an aircraft

Energy production facilities

The energy (heat and electricity) needed for the operation of the terminals is for the most part generated on site. For this to take place, several energy generation facilities, with varying capacities, are essential.

The largest facility is the block-type thermal power station (BHKW, see Glossary), which exists primarily to provide the terminals with electrical energy and heat. The natural gas-powered BHKW consists of six modules (12 cylinder internal com-



Functional concept for separation of water contaminated with de-icing material via the TOC system

Facilities, Operating Areas, Protective Measures

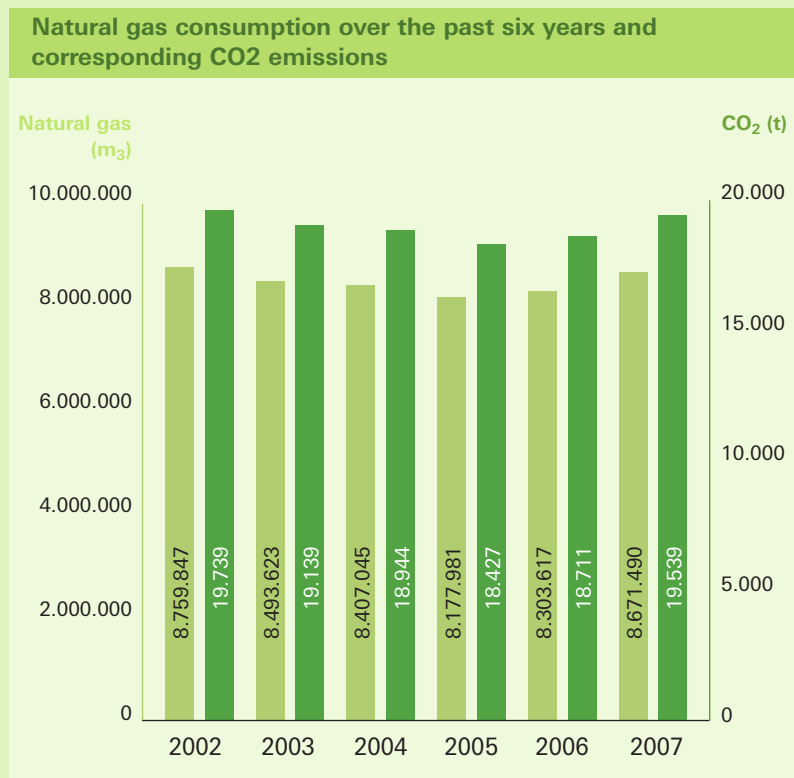
bustion engines), each of which drives a generator producing approx. 700 kW of electricity. From the heat generated by the operation of the motors (warm exhaust, warm cooling water), approximately 1,300 kW of energy can be obtained per module. The BHKW has a total thermal output capacity of approx. 12 MW. The southern central heating plant is also powered by natural gas. It is primarily used to provide heating for the southern area of the airport. The central heating plant re-entered service in 2005 after a modernisation programme. This facility has a total thermal output capacity of 19 MW. The two plants provide the majority of airport buildings with heat via the airport's internal heat distribution network.

Four areas of the airport are not connected to the heat distribution network. Decentralised heating facilities are operated in these locations. The areas affected are the Air Traffic Services ("DFS") Tower (including those parts of the building used by AIRSYS), the General Aviation Centre (hangars, office and workshop building, terminal), the German Meteorological Service's weather observation station and FHG's works sports centre.

These facilities are powered by heating oil, with the exception of the heating system in the works sports centre, which is powered by natural gas. The heating oil required is stored in tanks local to each facility (see following chapter).

The energy generating facilities are not required to participate in emissions trading. The determining factor here is the thermal output capacity of the facilities (see Glossary), which must exceed 20 MW per plant in order for participation to be mandatory.

The passenger terminals are characteristic airport facilities. Closely connected with the terminals, both functionally and spatially, are the Passenger Pier and the Airport Plaza. Amongst the facilities located in this building complex are offices, shops and restaurants, the environmental relevance of which arises both from the high energy requirements for heating, cooling and lighting, and from the generation of commercial waste.



Decentralised heating facilities

Facility/ Building	Fuel	Heat generated
Tower	Heating oil	457,0 kW
GAT	Heating oil	628,0 kW
DWD weather station	Heating oil	15,2 kW
Works sports centre	Natural gas	65,0 kW

Storage facilities

Several large storage facilities with associated filling equipment are used to store the various fuels and substances necessary for airport operations, with varying water hazardousness classifications (WGK, see Glossary). The substances stored here are relevant for waterway protection because of their water hazardousness characteristics and because they are stored underground.

Tank farm for kerosene, avgas and diesel fuels

The tank farm for kerosene, south of Apron 1, has the largest storage capacity: the double-walled individual tanks, each of which has a capacity of 100 m³, can together hold a total of 4.3 million litres. Apron tanker vehicles are filled with fuel via the filling equipment. The kerosene store is filled by road tankers. Smaller aircraft types, not powered by kerosene, obtain fuel from the Avgas refuelling station located on Apron 2. This underground storage tank has a capacity of 30 m³. Both aircraft fuel storage facilities are the property of FHG but operated by an external tanking service provider.

A site fuel station with storage tanks for diesel fuels (2 x 100 m³) and gasoline (100 m³) is avail-

able for refuelling all of the group's surface vehicles. Diesel fuel for the emergency electricity generators is stored in an underground tank with a capacity of 10 m³. Wide-ranging safety measures have been taken for all underground storage tanks, including double walls, leak monitoring equipment and anti-corrosion installations. The kerosene store also features additional structural protection, such as a layer of bitumen and a layer of concrete. Organisational safety and monitoring measures for these storage facilities are specified in FHG's Environmental Management.

Storage facility for aircraft de-icing material

The storage facility for aircraft de-icing material is located to the south of Apron 1. The facility, operated by STARS and monitored by RMH, con-



The tank farm fulfills all safety standards

sists of five above-ground double-walled storage tanks with a capacity of 30 m³ each, and one tank with a capacity of 10 m³. These tanks contain either glycol (WGK 1) or hot water. All the storage

Facilities, Operating Areas, Protective Measures

Storage facilities for water-hazardous substances in buildings

Storage location	Substance/ WGK	Capacity
Weather station (heating oil tank)	Heating oil, 2	6,000 l
Tower (heating oil tank)	Heating oil, 2	30,000 l
GAT (heating oil tank)	Heating oil, 2	50,000 l
BHKW oil tank	Motor oil/ Used oil, 2	10,000 l
Central storage RMH (container storage)	Various products in smaller quantities	Up to 1,000 l

Storage facilities in buildings

Several storage facilities for heating oil, motor oil and various other products are less significant for waterway protection. They are located within buildings with soiled floor surfaces, reducing the potential threat to the groundwater and thus also reducing the extent of additional protective measures necessary.

Land and buildings

Terminals, hangars and sheds

These buildings serve the needs of passenger handling and the maintenance and storage of aircraft and vehicles. They are the property of FHG. Some sheds and hangars are rented out to aircraft maintenance firms. The buildings are amongst the largest consumers of energy at the airport.



Storage for aircraft de-icing material

tanks and filling facilities are located on a water-tight concrete surface, so that no glycol can permeate the ground or reach the groundwater.

The development of “green” building concepts plays a growing role in Flughafen Hamburg GmbH’s Environmental Management. The goal is a noticeable reduction in the energy and drinking water requirements of individual buildings. In order to make the operation and design of its buildings as environmentally friendly as possible, FHG has already taken the following individual steps:

- Energy management is targeted at the most efficient use of energy possible. The following aspects are taken into account:
 - Increasing target temperatures for cooling buildings by up to 1 °C
 - Decreasing target temperatures for heating by up to 1 °C
 - Adjusting illumination times and levels to match usage times
- Manual control of lighting and heating, especially for aircraft hangars

The natural gas used for energy production releases less air pollutants than other fossil fuels, making it significantly more environmentally friendly. The BHKW also has an efficiency level of more than 90%, meaning that losses during energy conversion are small. As the BHKW is not able to produce the entire electricity requirement for the site, approximately 30,000 MWh of electricity per year have to be purchased externally. A portion of this electricity is already generated using renewable energy sources.

The thermolabyrinth installed in the basement of Terminal 1 makes use of the constant temperature of the ground close to the surface to pre-warm or pre-heat the air for the air conditioning by 2 – 3 K (°C). This brings with it an annual energy saving of some 1,400 MWh. This is equivalent to around 300t of CO₂ per year.

A number of measures have been taken to reduce drinking water requirements in recent years. Amongst these measures is the rainwater utilisation system in Terminal 1. This installation reduces drinking water requirements by some 6,000 cubic metres per year.

Studies have also been conducted to examine potential environmentally friendly models for the provision of energy for specific operating areas. An environmentally friendly model is already in place for the southern area of operations. The aim is, wherever possible, to plan and implement all future building and renovation projects in line with the “Green Buildings” concept.

Workshops

The airport premises are home to a motor vehicle workshop, an electrical workshop and a fitter’s workshop in the southern area of the airport, and a carpentry workshop in the northern



The Passenger Pier, the terminals and the Airport Plaza.

area, along with other smaller workshop facilities. The environmental impact of the workshops arises from, on the one hand, the generation of waste – especially waste classified as “hazardous” in the Act for Promoting Closed Substance Cycle Waste Management and Ensuring

Energy purchased externally over the last three years (in MWh)

2005	2006	2007
30.772	33.865	32.948

Environmentally Compatible Waste Disposal (“Kreislaufwirtschafts- und Abfallgesetz” or “KrW-/AbfG”) – and, on the other hand, from energy consumption (electricity, heat), as with all buildings, which are operated or owned by Hamburg Airport.

Facilities, Operating Areas, Protective Measures

Waste water generated in workshops and refuelling stations is piped via oil separators so as to ensure that waterway protection is at the level of the latest technology.

Disposal facilities

Various facilities are available on site for the collection of commercial waste, in the immediate vicinity of the actual point of generation of the various types of commercial waste. The facilities within the terminals are the waste rooms, which have been constructed in the basement floors of these buildings. Separate collection containers are kept in these rooms for the various types of waste (glass, paper, sortable waste, residual waste). Waste containers are available for use throughout the rest of the airport.

The waste collected in these containers is transported internally to a central waste collection point to await collection by an external specialist waste disposal firm. At this central location, too, thorough separation of the various types of waste is practised. Paper and residual waste are collected in waste compaction containers. Furthermore, packaging film and timber (palettes) from freight transshipment, electrical waste and metal waste are also temporarily and separately stored at this location.

For hazardous waste (see Glossary) such as used oil, waste containing oils, paint, etc., appropriate collection facilities are installed at the point of occurrence. These waste materials are collected directly from there by the specialist disposal firm, without any extra interim storage on FHG premises.

One relatively new aspect of waste management is the disposal of waste arising from passenger security checks. Such waste is mostly treated in

the same way as commercial waste, as it mostly consists of cosmetics and drinks. Spray cans, cigarette lighters and chemicals within this waste are stored in a separate room to await further disposal action.

Green areas

It is typical for an airport that grassland makes up a large portion of the premises. Of Hamburg Airport's total 519 ha area, approx. 255 hectares are green space, i.e. the grassed areas alongside the runways, taxiways and aprons. Part of this grassland is characterised by a scarcity in nutrients. From an ecological standpoint, such "lean" locations are very valuable, as there has been a strong decline in their numbers within Germany.

One of the aims of birdstrike prevention measures is to make the airport premises as unattractive as possible for birds. A reduction in food sources is one element in achieving this, making it necessary to largely do without the use of fertilisers. This aids in the maintenance of the low-nutrient areas within the airport premises and thus adds to the total ecological value.

In addition to the vast grassland areas, the airport premises also contain a number of woodland areas. These are mostly located to the west of the runway intersection.

Parts of the green space – grasslands and wooded areas – are compensatory areas. These areas have been created in order to compensate for other green spaces lost to construction projects. These areas are:

- Various grass areas within the airport premises where the reduction of soil nutrients is planned, so as to supplement existing low-nutrient areas.
- Timber plantations along the access road

- to Apron 2.
- Half of a landfill some 9 ha in size has been sown with grasses from low-nutrient, warm areas. The other half, on the northern side of the landfill, has been planted with timber; this will also be the site of a small moist biotope.
 - Trees planted (individually or in groups) in various areas of the airport premises.

The comparatively undisturbed green areas of the airport site provide an important home within the Hamburg city limits for a large number of animal species. This includes a number of rare insect species, adapted to low-nutrient or very warm locations, which have been classified as endangered on the Red Lists (see Glossary). This variety of species is intentional and desired, and is monitored by mapping.

Due to the strengthening of security regulations, the airport perimeter fence on the edge of the airport premises must be kept free of vegetation on both sides, so as to prevent people from climbing the fence. In the recent past, this has led to the loss of some timber areas; this loss has, however, been compensated. The air approach sectors in the immediate vicinity of the airport must be kept free of all obstacles. This necessitates the regular pruning of trees growing into these areas.



Green spaces characterise the airport premises

Facilities, Operating Areas, Protective Measures

- 1 regular pruning of trees (to ensure absence of obstacles)
- 2 cleared area along perimeter fence (required by Aviation Security Act)
- 3 works sports centre (decentralised heating system)
- 4 rainwater retention basin
- 5 DWD weather station (decentralised heating system, heating oil storage)
- 6 compensatory areas
- 7 Tarpenbek as drainage catchment
- 8 fuel station for small aircraft
- 9 general aviation centre (decentralised heating system, heating oil storage)
- 10 tower building (decentralised heating system, heating oil storage)
- 11 TOC facility





Environmental Programme 2005 – 2008

Reduction of energy consumption levels

One goal of the Environmental Programme was to take measures which reduce FHG's energy requirements and/or promote the use of alternative energies. The following measures were taken to achieve this goal:

- In order to keep the energy requirements for air conditioning in the Airport Plaza as low as possible, water-based cooling systems were installed, similar to those in the new Terminal 1. The cooling beams and cooling plates used have an energy requirement some 10% below that of other systems. To further reduce the energy requirements for cooling and heating the Plaza, all ventilation and air management equipment in the Airport Plaza will be connected with the thermo-labyrinth in the cellar of Terminal 1. The necessary work has already been completed.
- A further measure was the installation of a photovoltaic facility on the FHG premises. It has not yet been possible to complete this project, as the buildings that could be considered either do not have sufficient static post-buckling strength or will be demolished in the near future. A contract has, however, been concluded with an external electricity provider to ensure that a portion of the electricity provided comes from renewable energy sources, as a first step towards the use of environmentally friendly energy.
- Ground handling service provider GroundSTARS has acquired a total of 27 natural gas-powered baggage tugs. At the start of 2007, a natural gas fuel station was installed on Apron 1, near the kerosene fuel facility, to provide these vehicles with fuel.
- The STARS subsidiary has acquired a natural gas-powered bus for the shuttle service between the airport and the Lufthansa base.
- A car converted to operate on hydrogen was delivered to FHG in October 2006. Since mid-2007, GroundSTARS has also been operating two baggage tugs equipped with hydrogen fuel cells. The three vehicles are deployed in "normal operations" in order to gain practically relevant insights into the suitability of hydrogen-based vehicle technology. To guarantee a trouble-free fuel supply for these vehicles, a hydrogen fuel station was installed alongside the new natural gas fuel station.

Reduction of ground noise and air pollution

Approval for APU operation on the apron has been significantly restricted, with the airport offering alternative technologies instead. Enhanced monitoring and checks on the apron are intended to ensure that airlines are making use of the options offered by the airport and that they are observing the ban. One additional member of staff has been appointed by the Environmental Protection Centre for this purpose. This member of staff inspects the ground handling positions on a daily basis and, where necessary, ensures that APUs are switched off. These measures have achieved a 5% reduction in air pollutants.

Reduction of drinking water requirements

In order to at least put a damper on the expected increase in drinking water requirements asso-

Reduction of fuel requirements and air pollution
Various measures were planned to reduce the fuel requirements for ground handling services and to increase the use of environmentally friendlier fuels. The following individual measures were carried out as part of the Environmental Programme:

ciated with the opening of the Airport Plaza, the building will be connected to the rainwater utilisation system in Terminal 1. The pipes to connect to the rainwater utilisation system were installed during the construction of the Plaza. All measures necessary to allow the use of rainwater will be in place when the Plaza is completed.

Waste reduction

The collection and subsequent processing of toner cartridges by an external service provider began in 2005. Collection points have been set up in several buildings. The containers are regularly emptied by the contractor, Office-Tech. The company then refills the cartridges for reuse.

At present, there are no appropriate recycling companies located suitably close to the airport to process separately collected CD-ROMs. This measure has therefore been deferred.

Environmental status inspections in the airport area

Independent of the planned programme, several examinations of the natural environmental condition were conducted in the last three years. Amongst the examinations carried out were:

- Surveys of vegetable biomass produced at the airport. These surveys revealed an overall positive condition for the greenfield areas under observation.

- Regular observations of the bird community by the FHG Environmental Protection Centre and FHG Traffic Control to estimate birdstrike risk levels. Based on these observations, there seems to have been no change in the number of birds and bird species in recent years.

- Repeated annual biomonitoring campaigns, using bees as monitoring organisms, to deter-

mine the level of pollutant exposure of plants, at least with reference to those parts of plants above the ground. These investigations, which also took into account the honey produced by the bees, showed no increase whatsoever in the impact on either the bees or the plants.

Against this background, the monitoring programme has not been conducted as initially planned.

Expansion of environmental management systems

The QuB Project (Quality Association of Environmentally Conscious Companies) was launched in cooperation with the Department of Civil Engineering and the Environment in August 2005. Nine companies, commercially associated with FHG, participated in this project, which was aimed at establishing small Environmental Management Systems and attaining certification for these systems. The project was successfully completed at the beginning of 2006 with the certification of all participating companies.

Environmental Programme 2008 – 2011

Reduction of energy consumption levels/ climate protection

The reduction of energy consumption will once again constitute an important aspect of the environmental programme. The programme as a whole should contribute to resource conservation as well as supporting climate protection measures. Measures to reduce energy requirements are therefore accompanied by initiatives that lead to increased usage of climate neutral energy and/or energy from environmentally friendly sources. It is planned to reduce the energy requirements in the coming years by a total of 10% in comparison to the reference year, 2007, by means of the following measures:

- A portion of externally purchased electricity is already certified as coming from climate neutral generation. This represents approximately the amount of electricity used by FHG's multi-storey car parks. FHG aims to double the portion of climate neutral electricity as of 2009.
- The block-type thermal power station generates, in certain operating conditions, unusable quantities of electricity. RMH and FHG are working on a concept to enable this "waste electricity" to be utilised in the future, e.g. to produce hydrogen. On the one hand, this will increase the efficiency of the block-type thermal power station. On the other hand, this process will ensure the environmentally friendly production of the hydrogen used to power some of FHG's vehicle fleet.
- RMH is increasingly replacing existing lamps and bulbs with more energy efficient models. The new eco-lamps use 15% less energy than normal lamps. These lights also have a much longer life, which means that their

usage can contribute to a reduction in quantities of waste.

- The subsidiary company, SAEMS, will modernise the illumination of its workshops. This should result in a 15% reduction in energy consumption in this area.
- FHG is also investigating the possibilities for using organic waste produced on site to generate energy. This will increase the amount of environmentally friendly and climate neutral energy as a proportion of the total energy used by FHG.

Noise Protection

The reduction of aircraft noise has long been an important element in Flughafen Hamburg GmbH's environmental management. In addition to FHG's existing long-term activities in this area, the following additional measures will be implemented in the years ahead:

- To increase noise protection after midnight, FHG and airlines are working together on possibilities to optimise the regulations for delays. Efforts are planned to increasingly bring flights expected to arrive between 11 pm and midnight forward to arrive between 10 pm and 11 pm.
- FHG and GroundSTARS plan the acquisition of additional heating equipment for climate control during aircraft ground handling at remote apron positions. This will further reduce the need to use APUs, thus reducing surface noise.
- The current voluntary noise protection programme will be continued.

Implementation of a programme to protect roofs in the airport neighbourhood

In the years ahead, FHG will introduce a programme to better prevent damage to buildings and vehicles arising from wake turbulence. This programme, which will include, amongst other things, the protection of roof tiles, will also include measures for thermal insulation of the affected buildings.

Environmental management / promotion of environmental awareness

The environmental effects of terminal operations, such as energy consumption or the creation of waste, are also caused by the shops and restaurants located in the terminals. FHG therefore only has indirect influence on these effects. Against this background, FHG intends to exercise its influence on the tenants in the terminals and the Airport Plaza to encourage them to operate their businesses in as environmentally friendly a way as possible. To achieve this, FHG is working on an environmental brochure containing suggestions and guidelines for energy conservation, waste reduction and other environmentally friendly measures. This guide will be made available free of charge to tenants.

Extrapolation of Measures from the Environmental Programme 2005–2008

The measures from the Environmental Programme 2005–2008 which have not yet been implemented have been updated for this programme. Specifically, this means:

- Possibilities are still being sought for the economically viable installation of a photovoltaic facility on the FHG premises. If a reasonable operating concept can be produced, it will be implemented.

- As soon as an ecologically and economically viable option exists for the transportation of CD-ROMs to an appropriate recycling facility, the collection system will be put in place.
- The inspection of the state of the environment in the airport neighbourhood, not yet completed, will be carried out in the next three years.



Hamburg Airport in Figures

Year	2005	2006	2007	Year	2005	2006	2007
Turnover in € million	203,4	223,1	234,2	Aircraft movements			
Employees *	1.660	1.656	1.612	Total	156.380	168.617	173.768
* Annual mean value excluding trainees/apprentices and Executive Board				of which:			
Passengers				Non-commercial	22.368	23.060	22.396
Total	10.675.127	11.954.560	12.780.509	Commercial traffic	134.012	145.557	151.372
of which:				of which:			
Transit	61.184	58.292	74.381	Scheduled flights	115.926	129.521	135.822
Domestic	4.538.609	4.969.355	5.393.197	Tourism	16.813	15.083	14.628
International	6.075.334	6.926.913	7.312.931	Package tours	–	–	–
				other traffic	1.273	953	922
Passengers per aircraft movement				of which over Alsterdorf			
Average	80,1	82,5	84,9	Take-off (15)	944	270	730
of which:				Landing (33)	1.593	1.604	2.535
Scheduled flights	70,2	74,5	77,7	of which over Langenhorn			
Charter flights	154,2	156,1	157,2	Take-off (05)	4.154	5.221	4.691
				Landing (23)	37.771	40.206	45.767
Air Freight				of which over Niendorf			
Total in tonnes	75.152,4	77.172,9	84.404,9	Take-off (23)	23.108	28.225	21.455
of which:				Landing (05)	14.213	13.381	17.204
Aircraft freight	24.244,8	31.571,4	33.479,9	of which over Ohmoor			
HGV freight	50.133,5	45.010,2	46.924,3	Take-off (33)	48.152	48.747	58.338
Transit	774,1	591,3	4.000,8	Landing (15)	22.774	27.280	19.710
				Night aircraft movements			
Airmail	7.687,0	6.048,1	6.875,5	Total	6.357	7.338	7.587
				of which:			
Aircraft (landings) by type				10p.m – 11p.m.	4.712	5.450	5.693
Total	78.182	84.313	86.886	11p.m. – 12a.m.	1.206	1.377	1.438
of which:				12a.m. – 6a.m.	439	511	456
Propellor/helicopter	17.716	16.251	15.755				
Chapter 3 Bonus	59.683	67.377	70.663				
Chapter 3	783	685	467				
Chapter 2	0	0	0				
Uncertified	0	0	1				

Gesellschafter

51 % Freie und Hansestadt Hamburg
 49 % HAP Hamburg Airport Partners GmbH & Co KG
 (Hochtief Airport GmbH und Dublin Airport Authority Plc.)

The increase in noise complaints is partially attributable to the fact that a small number of people complained very frequently. Increased energy consumption is the result of the entry into service of Terminal 1, general

Year	2005	2006	2007	Year	2005	2006	2007
Engine tests:				Waste			
Total	218	381	385	Total in tonnes	2.995	3.328	3734,54
of which:				of which:			
daytime	141	175	198	Sheeting, DSD	41	29	26
night	77	77	54	Newspapers	167	102	107 *
of which:				Mixed paper	392	431	421
Take-off power	22	34	27	Waste wood	70	89	107
Part Power	85	92	92	Unsorted recyclables	792	823	602
Idle	111	125	133	Non-recyclable waste	1.534	1.852	2.471
of which:				* until 31.10.2007. After this date in mixed paper.			
In the noise protection hangar	213	372	376	Hazardous waste (selection of most important materials)			
In front of the noise protection hangar	2	2	9	Waste oil (in l)	33.187	29.966	33.416
Remote positions	3	2	0	Oil filters (in l)	3.900	720	1.200
Noise complaints	1.448	2.057	3.296	Oil-contaminated materials (m ³)	20,4	5,5	13,1
Energy				Fluorescent tubes (pcs)	5.653	5.236	2.535
Natural gas usage				Paint shop waste (kg)	4.720	2.170	3.680
in MWh	105.829	116.697	118.686	Fat separator contents (m ³)	598	420	509
of which:				Dry batteries (t)	0,8	0,05	–
in BHKW	90.987	99.734	104.252	Air pollution			
in the central heating plant	14.841	16.963	14.434	Measured to east of FHG premises			
Energy production				Particulate matter in µg/m ³	21	22	19
in MWh	88.890	97.743	99.960	Sulphur dioxide in µg/m ³	3	3	3
of which:				Nitrogen dioxide in µg/m ³	25	25	22
in BHKW	77.536	84.766	88.918	Nitrogen monoxide in µg/m ³	9	9	8
in the central heating plant	11.336	12.977	11.042				
Water							
consumption in m ³	150.462	147.597	135.693				

construction projects and the growth in passenger figures over recent years. The stable and consistently low concentrations of air pollutants, however, show that this does not have a detrimental effect on air quality. The

decrease in consumption of drinking water is the result of savings programmes implemented over the last few years.

Glossary

Acetates

Water-soluble salts of acetic acid, e.g. potassium acetate, sodium acetate.

APU (Auxiliary Power Unit)

Used to provide the aircraft with electricity and air during ground handling, and to start the main engines immediately before take-off.



Benzene

The simplest hydrocarbon compound with an aromatic ring system (benzene ring). Benzene (C_6H_6) is highly inflammable, toxic and classified as a carcinogen. It is used as a fuel additive and is found in motor vehicle exhaust gases.

Biotope

A biotope is a habitat for specific plant and animal species, characterised by its abiotic factors.

Block-type thermal power station (BHKW)

Small, normally natural gas fired power station for generating heat and electricity. Functions

according to the principle of power-heat coupling, whereby waste heat from electricity generation is used for heating.

Carbon dioxide (CO₂)

Colourless gas, produced in various ways including as a result of burning fossil fuels. CO₂ released in large quantities as a result of human activities is one of the main causes of the global greenhouse effect.

Commercial waste

Commercial waste, classified as non-hazardous, is similar in structure and composition to private household waste.

Continuous noise level

(equivalent continuous noise level L_{eq})

Average level of noise pollution measured over a defined period of time. In general, the energy-equivalent continuous noise level (L_{eq3}) is used today, as an increase in the noise level of 3 db(A) is equivalent to doubling the noise energy.

Cooling beams, cooling plates

Roof segments surrounded by circulating air. They are linked by pipes or channel filled with cold water.

dB (decibel)

Unit of measure for acoustic signals, oriented towards human hearing. Because there is a difference in the way humans perceive high and low frequencies, measuring instruments have built-in compensating filters. The filtered unit of measure is indicated as db(A).

DIN EN ISO 14000 ff.

The ISO 14000 ff. series of standards developed by the International Organization for Standardization refers to the organisation of operational

environmental management. The most important of these standards is ISO 14001: this standard forms the basis for a certifiable environmental management system.

Emission

Output into the environment of irritating or harmful substances (gas, liquid or solid), noises, vibrations or radiation.

Emissions

Harmful or undesired emissions, such as noise, vibrations, hazardous materials or radiation as perceived or measured at the location of influence.

Energy efficiency level

The ratio of “produced” (i.e. transformed and usable) energy to the total energy contained within the energy source used.

Environmental impact

Negative (or positive) effect on the environment, resulting from the various environmentally relevant activities carried out by a company. EMAS II differentiates between direct and indirect environmental impact. According to this classification, direct environmental impact consists of those effects on the environment over which the company has direct influence. If the company only has indirect influence over an effect, this is considered to be indirect environmental impact.

Environmental management system

System for the coordinated processing of the operational environmental system, geared towards concrete local environmental impact. The core aspects of an environmental management system are a company’s environmental policy and environmental programme.

Environmental policy

Component of an environmental management system, establish guidelines for environmental protection at the highest level within a company.

Environmental programme

Within the framework of an environmental management system, a plan of measures to be applied for a specified period of time in order to minimise environmental impact.

EU Eco-Management and Audit Scheme (EMAS II)

The European Union has passed a second set of regulations for voluntary participation in the Eco-Audit (EU No. 261/2001), which applies to all EU member states. It entails setting up an environmental management system in conformity with the 2004 edition of ISO 14001. Further elements include the publication of environmental statements for public release and an environmental review.

Glycols

Water-soluble liquids which are used as anti-freeze. Diethylene glycol and propylene glycol are the main agents used for de-icing aircraft.

Hazardous waste

The legally correct term, since 2006, for waste matter previously classified as “requiring supervision” or “especially requiring supervision”. The new term has been adopted so as to correspond more closely with the terms used across the EU for this type of waste.

ICAO (International Civil Aviation Organisation) Committee of the UN, responsible amongst other things for creating standards for civil aviation. Aircraft licensing is subject to various chapters of Appendix 16 of the ICAO guidelines on noise

Glossary

emissions and air pollution. Chapter 4 currently contains the strictest noise limits for licensing aircraft types. It was ratified by ICAO in 2006.

Kerosene

Fuel for aircraft engines, chemically and physically similar to diesel fuel.



L_{eq} – see “Continuous noise level”

Nitric oxide (NO_x)

Nitrogen monoxide (NO) is a colourless, non-water-soluble gas, which is converted to nitrogen dioxide (NO₂) upon contact with air. NO₂ reacts with water to form nitric acid which can damage both the natural environment and buildings.

When exposed to high temperatures and intense sunlight, NO₂ is a trigger for so-called “summer smog” with increased concentration levels of ozone.

Oil separator

Collection equipment for separating petrol or other mineral oil hydrocarbons from waste water. Separators take advantage of the fact that these substances are lighter than water and therefore collect on the surface of the water.

PAH

Polycyclic aromatic hydrocarbons (PAHs) are compounds with several benzene rings, produced as a result of combustion processes. Some PAHs are classified as carcinogenic and/or may cause genetic defects.

PCA systems (Pre-conditioned air systems)

Equipment to provide external air conditioning for aircraft. PCA systems are employed to make the operation of aircraft auxiliary power units unnecessary.

PM10

Specialist term for airborne particles 10 µm or less in size.

Primary energy source

Natural energy source immediately after extraction or mining, e.g. crude oil, coal, gas.

Push-back

As aircraft can only move by means of engine propulsion, even on the surface, they cannot move in reverse under their own power. It is, however, necessary for aircraft to reverse to leave parking positions on jetbridges. They are pushed backwards from these parking positions with special vehicles. This procedure is known as push-back.

Radiant cooling

The extraction of heat energy by the use of interior cooling elements.

Red lists endangered species

Lists of animal and plant species in danger of extinction, compiled by an international commission.

Renaturalisation

The restoration of a biotope or ecosystem to its natural state.

RiStWag

German guidelines for construction measures in water catchment areas. Amongst issues covered by these guidelines are the criteria for designing separator systems.

Soot

Fine graphite particles resulting from the incomplete burning of hydrocarbon compounds. They are carcinogenic.

Sulphur dioxide (SO₂)

Colourless, foul-smelling, cough-inducing gas. Reacts with water to form an acid which can, for example, be harmful to plants and buildings.

Surface noise

Noise generated by aircraft whilst on the ground. Classical surface noise is generated by engine test runs, aircraft taxiing operations and APU operation. Noise generated by take-off and landing is not considered to be surface noise, not even for the phases when the aircraft is located on the ground.

Take-off power

Engine power of at least 90%, as required at take-off.

Thermal output capacity

The maximal thermal output of a combustion facility based on the specific calorific value of the fuel in use. The calculation is based on the max-

imal quantity of fuel burnt within a specific time-frame.

TOC

Total organic carbon. A unit of measure for quantities of dissolved organic substances.

Toluene (also known as methylbenzene)

Chemically very similar to benzene, but less toxic. It is used as a fuel additive and is found in motor vehicle exhaust gases.

Unburnt hydrocarbons (C_xH_y)

When exposed to high temperatures and intense sunlight, unburnt hydrocarbons contribute to smog with increased concentration levels of ozone.

Water hazardousness classification (WGK)

Measurement and classification of the hazardousness of a substance for water, according to legally prescribed criteria. The WGK has to be individually measured for every material.

Xylene (also called dimethylbenzene)

Used as a solvent, a typical component of vehicle exhaust fumes. It is less toxic than benzene.

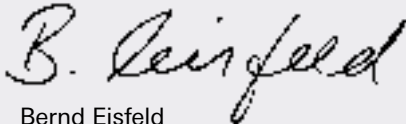
Validation

Declaration of validity

Flughafen Hamburg GmbHs environmental management system, incorporating Flughafen Hamburg GmbH and its subsidiary companies SAEMS, CATS, GroundSTARS, STARS, RMH and AIRSYS, including the environmental policy, environmental objectives and programmes, environmental operations inspection procedures and the environmental statement meet the requirements of Directive (EU) No. 761/2001 in the revision published on 2 February, 2006.

The data and information presented in this environmental statement adequately and accurately reflect the environmental relevance of all activities of the named companies at the location in question.

Hamburg, 19 September, 2008



Bernd Eisfeld
Environmental Assessor

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Schedule

The next Environmental Statement will be published in abbreviated form in 2009. The abbreviated edition, with updated objectives and inspection data, will appear annually.

The next comprehensive Environmental Statement will be published in March, 2011, after validation by an environmental auditor.

Hamburg Airport at a Glance

Gebäude und Einrichtungen Buildings and facilities

- T1 Terminal 1
- Plaza Airport Plaza
- T2 Terminal 2
- P1-P5 Terminal-Parken - Terminal car parking
- P6, P9 Holiday-Parken - Holiday car parking (mit Shuttle-Bus - with shuttle bus)

- 1 Radarturm mit Technikgebäude
Radar tower with technical building
- 2 Luftpostleitstelle
Airmail control centre
- 3 Frachthof
Cargo terminal
- 4 Speditionen
Freight forwarding agencies
- 5 Frachthallen
Air cargo hangars
- 6 Kantine
Cafeteria
- 7 Werkstätten
Workshops
- 8 Ausweisstelle Geb. 235
Security pass office (building 235)
- 9 Flugzeughallen
Aircraft hangars
- 10 Beschäftigten-Parkhaus
Staff car park
- 11 Tankdienstgebäude
Refuelling service building
- 12 Tankhof
Petrol/gas filling station
- 13 Enteisungsmittelzentallager
De-icing station
- 14 Hubschrauberlandefläche Vorfeld 1
Apron 1 helipad
- 15 Polizei-Hubschrauberstaffel
Police helicopter station
- 16 Geschäftsflygerzentrum
General aviation terminal
- 17 Flugsicherung (DFS) mit Kontrollturm
German Air Traffic Services (DFS) with control tower
- 18 Hubschrauberlandefläche West
Helipad west
- 19 Wetterbeobachtungsstation Deutscher Wetterdienst (DWD)
Weather observation station of the German Meteorological Service (DWD)
- 20 Betriebssportanlage
Works sport facility
- 21 Betriebsbereich Nord (Flughafenmeisterei)
Northern operations area (airport maintenance)
- 22 Flughafenfeuerwehr
Airport fire brigade

Technische Anlagen und Systeme Technical facilities and systems

Instrument Landing System für die Landerichtungen (150° = 15)
Instrument Landing Systems for landing directions (150° = 15)

- 23 ILS-Haupteinflugzeichen 23
Main ILS approach indicator 23
- 24 ILS-Landkursender 05
ILS localiser 05
- 25 ILS-Gleitwegsender 23 und VOT
ILS glide path transmitter 23 and VOT
- 26 ILS-Landkursender 15
ILS localiser 15
- 27 ILS-Gleitwegsender 05
ILS glide path transmitter 05
- 28 ILS-Landkursender 23
ILS localiser 23
- 28 ILS-Haupteinflugzeichen 05 (FU)
Main ILS approach indicator 05 (FU)
- 30 UKW Sichtpeiler
VHF marker beacon
- 31 Empfängerstation
Receiving station
- 32 ILS-Gleitwegsender 15
ILS glide path transmitter 15
- 33 ILS-Landkursender 33
ILS localiser 33
- 34 ILS-Haupteinflugzeichen 15 (GT)
Main ILS approach indicator 15 (GT)



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Keep in touch...

For additional information, DVDs are available free of charge from the Environmental Protection Centre upon request. Topics include airport ecology and the noise protection hangar. The Flughafen Hamburg GmbH Environmental Protection Centre will be pleased to assist you with any questions you may have relating to environmental protection.

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