

Environmental Report

*Environmental Statement 2008 and Environmental Program to 2011
for Frankfurt Airport*





Validation in conformity with EMAS*
Certification in conformity with DIN EN ISO 14001

*Currently relates to the Airport site. The associated Environmental Statement
is on pages 2 to 3, 16 to 27, 32 to 35, 40 to 45, 48 to 63, 68, 84 to 145.

Environmental indicators 2006 and 2007				
Traffic statistics		2006	2007	Δ 06/07
Passengers (arriving + departing + transit)		52,821,778	54,167,817	+ 2.6 %
Airfreight (arriving + departing + transit)	[t]	2,057,175	2,095,293	+ 1.9 %
Airmail (arriving + departing + transit)	[t]	96,889	95,168	– 1.8 %
Traffic units without transit *		73,756,590	75,589,063	+ 2.6 %
Aircraft movements (arriving + departing)		489,406	492,569	+ 0.7 %
Aircraft movements at night (arriving + departing)		50,448	49,797	– 1.3 %
Aircraft noise		2006	2007	Δ 06/07
Equivalent continuous sound level [Leq(4) in dB(A)] based on the German Aircraft Noise Act in conformity with DIN 45643				
Approach: monitoring station 01 Offenbach-Lauterborn	[dB(A)]	62	62	± 0
Approach: monitoring station 06 Raunheim	[dB(A)]	61	61	± 0
Take-off: monitoring station 12 Bad Weilbach	[dB(A)]	59	59	± 0
Take-off: monitoring station 51 Worfelden	[dB(A)]	59	58	– 1
Ground noise: monitoring station 03 Zeppelinheim	[dB(A)]	51	51	± 0
Ground noise: monitoring station 08 Kelsterbach	[dB(A)]	55	55	± 0
Percentage of western operations (from the parallel runway system with take-off toward the west, approach from the east)				
	[%]	71	76	
Percentage of eastern operations (from the parallel runway system with take-off toward the east, approach from the west)				
	[%]	29	24	
Greenhouse gases Fraport AG		2006	2007	Δ 06/07
Direct CO ₂ emissions (Scope 1 GHG Protocol- standards, here fuels)	[t]	28,125	30,311	+ 7.8 %
Indirect CO ₂ emissions (Scope 2 GHG Protocol- standards, here purchase of electricity, heat, and cooling energy)	[t]	217,343	202,813	– 6.7 %
Emissions acting locally from air traffic		2006	2007	Δ 06/07
Aircraft emissions measured up to a height of 300 meters (taxiing, take-off, climb-out, descent incl. roll-out, engine ignitions, APU ¹⁾)				
NO _x	[t]	2,587	2,610	+ 0.8 %
HC	[t]	635	621.7	– 2.0 %
PM10	[t]	11.2	11.4	+ 2.2 %
Specific aircraft emissions measured up to a height of 300 meters (taxiing, take-off, climb-out, descent incl. roll-out, engine ignitions, APU ¹⁾)				
NO _x	[g/TU*]	35.07	34.3	– 1.4 %
HC	[g/TU*]	8.60	8.2	– 3.5 %
PM10	[g/TU*]	0.15	0.15	± 0
Traffic		2006	2007	Δ 06/07
Percentage of passengers using public transport	[%]	33	34.4	+ 1.4 % points
Percentage of passengers using high-speed trains	[%]	15	17	+ 2.0 % points

* A "traffic unit" (TU) is a passenger with baggage (excluding transit passengers, according to ADV and ACI) or 100 kg cargo or mail.

Traffic					
		2006	2007	Δ 06/07	
Percentage of employees of Fraport AG using public transport	[%]	36.6	33.2	– 3.4% points	Decrease possible on account of increase in flexibility of shift times.
Percentage of employees of FRA ²⁾ using public transport	[%]	38.6	37.8	– 0.8% points	No major changes are expected in the annual cycle, the figure was therefore taken from the year 2005 for 2006.
Energy consumption FRA Site ²⁾					
		2006	2007	Δ 06/07	
Total energy consumption	[mil kWh]	1,072.8	1,034.6	– 3.6%	Total of all energy sources.Reduction due to meteorological changes (warmer winters, cooler summers).
Relative total energy consumption	[kWh/TU*]	14.5	13.7	– 5.6%	
Electricity	[mil kWh]	575	566	– 1.6%	
Heating energy	[mil kWh]	379	358	– 5.5%	District heating and quantity of thermal heating developed on site from local heating, gas, and heating oil.
Cooling energy	[mil kWh]	119	110	– 7.6%	Cooling exclusively from external district cooling supply.
Energy consumption Fraport AG					
		2006	2007	Δ 06/07	
Energy consumption (electricity, heating energy, cooling energy)	[mil kWh]	587.96	566.88	– 3.6%	Total of all energy sources together.
Electricity	[mil kWh]	287.64	285.62	– 0.7%	
Drinking water and service water FRA site ²⁾					
		2006	2007	Δ 06/07	
Drinking water	[mil m ³]	1.579	1.687	+ 6.8%	Increase due to construction sites.
Relative drinking water consumption	[l/TU*]	21.4	22.3	+ 4.2%	
Service water	[mil m ³]	0.150	0.152	+ 1.3%	
Share of service water in total water consumption	[%]	9.5	9.0	– 0.5% points	
Drinking water and service water Fraport AG					
		2006	2007	Δ 06/07	
Drinking water	[mil m ³]	0.867	0.967	+ 11.5%	Increase due to construction sites.
Service water	[mil m ³]	0.123	0.117	– 4.9%	
Wastewater FRA ²⁾					
		2006	2007	Δ 06/07	
Sewage	[mil m ³]	1.626	1.605	– 1.3%	
Relative sewage volume	[l/TU*]	22.05	21.20	– 3.9%	
Groundwater					
		2006	2007	Δ 06/07	
Nitrate content at measuring station 45	[mg/l]	96	84	– 12.5%	The intensive process of nitrate removal is having a significant impact on the decrease in concentration.
Hazardous materials Fraport AG					
		2006	2007	Δ 06/07	
Hazardous materials that were supplied as dangerous goods and consumed (excluding fuel)	[t]	215	223	+ 5.2%	Value incl. propane gas consumption for operation of firefighting exercise system. Strong fluctuations on account of varying consumption of surface deicing agents from year to year.
Waste					
		2006	2007	Δ 06/07	
Recycling each year (without soil and construction debris)	[t]	19,936	20,422	+ 2.4%	Increase on account of non-recyclable waste (see categories listed for disposal each year).
Disposal each year (without soil and construction debris)	[t]	3,568	4,280	+ 20.0%	Fluctuations in quantities each year are currently based on non-cyclical occurrence. In the year 2007, substantial quantities of waste were generated which are not recyclable: Sludge from the rainwater retention basin, Sludge from the sewage treatment plant, Plastics, Mixed materials, including critical parts waste
Recycling rate	[%]	85	83	– 2.0% points	

¹⁾ Auxiliary power unit ²⁾ Entire airport site

Sustainable environmental protection is one of the core functions within the Fraport Corporate Strategy. Fraport regards airports and their surrounding regions as organic units and takes its environmental activities beyond the scope of the legal regulations whenever possible. Our interpretation of environmental protection requires all sectors within the air-transport industry to join forces and involve politics as well. We therefore pursue a policy of encouraging future-proof solutions in the associations within the industry and their initiatives. Fair dialog with all our stakeholders forms the basis for our commitment to create a future worth living. Our EMAS-validated and ISO 14001-certified Environmental Management System provides the transparency required for this endeavor.

THE EXECUTIVE BOARD OF FRAPORT AG

Dear Readers,

Since our last Environmental Statement was published three years ago, environmental protection has gained an increasingly prominent role in the public debate. Climate change and the need for climate protection have taken center stage in the media, putting more pressure on politicians and members of the business community across the globe to generate appropriate solutions. This debate is no longer limited to specific subjects and measures but has expanded to encompass analysis and strategies based on this. What is at issue is the ecological future of the planet and the people who are dependent in a huge variety of ways on the natural resources of planet Earth.

This global perspective is undoubtedly necessary, but it is important not to lose sight of the fact that efficient environmental protection embraces an array of individual aspects that have to be systematically assessed and processed in gradual steps that may extend over many years. The 2008 Environmental Statement provides an insight into the activities of our environmental stewardship to anyone with an interest in this area. This statement addresses a broad spectrum of environmental issues including climate protection, aircraft noise, energy efficiency, resource conservation, and biodiversity. Our track record demonstrates that we have implemented the goals defined in our Environmental Program for Frankfurt Airport with verifiable success. Transparency is particularly important in this context and we have complied with the strict standards of the European Eco-Management and Audit Scheme EMAS since 1999. Fraport is also certified in conformity with the global environmental standard ISO 14001. These two audits are carried out on a regular basis and ensure that our environmental management is fully compliant with all environmental protection requirements.



PROF. DR. WILHELM BENDER
Chairman of the Executive Board (VV)

DR. STEFAN SCHULTE
Vice Chairman of the Executive Board and Executive Director
Traffic and Terminal Management, Airport Expansion (VB)

The 2008 Environmental Statement covers a number of new focuses which are vitally important from our point of view:

- Joint climate protection activities in the global aviation industry
- The Fraport Climate Protection Program for CO₂ reduction at Frankfurt Airport.
- The airport expansion in Frankfurt, which will safeguard our corporate mission to deliver market-based and sustainable mobility by eliminating capacity constraints.
- Mitigation measures, compensation programs and renaturation activities during the course of airport expansion in Frankfurt, particularly in relation to the development of aircraft noise.
- The environmental policy of our group, which is active beyond Frankfurt through shareholdings in other national and international airports, and in airports which we operate under a management contract.

Our Environmental Statement is particularly intended to encourage dialog between the airport, residents living nearby, and everyone interested in issues related to the environment. This exchange of views is crucial at a time when people are demanding more mobility than ever before while also being confronted on a daily basis with the finite nature of the resources required by mobility. We are well aware that innovative and mutually acceptable solutions are necessary. Identifying these solutions will not be easy, and a great deal of work will have to be carried out in the upcoming years. The staff at Fraport will do everything in their power to develop mobility concepts that meet customers' requirements, protect the environment, and are sustainable. The following report will demonstrate the progress we have already made.

We hope that you will find our Environmental Statement interesting, exciting and thought-provoking. We look forward to discussing these issues with you.



DR. MATTHIAS ZIESCHANG
Member of the Executive Board and Executive
Director Controlling and Finance (VF)

HERBERT MAI
Member of the Executive Board and
Executive Director Labor Relations (VA)

INTERVIEW WITH DR. PETER MARX *Vice President Environmental Management (VAU)*

Environmental protection driven by globalization



Dr. Marx, the last major Environmental Statement published by Frankfurt Airport came out in the summer of 2005. It is now 2008, and when it comes to environmental issues we would be justified in saying that three years is rather a short space of time. However, there is a sense that more has happened on the environmental protection front during the past three years than over the previous three decades.

Climate change is most certainly the crucial factor underlying this perception. It is now generally accepted across the world that human activities have caused the earth and its atmosphere to warm up. Climate change is a fact and most people acknowledge the need to restrict its effects. The challenges associated with this phenomenon are indeed unquantifiable, and go way beyond anything humankind has experienced in the past. The situation is correspondingly dramatic and significant public pressure is being exerted on politicians and business leaders alike.

Which brings us to the topic of this interview. What is Fraport doing about climate protection?

Firstly, we're taking the most obvious and effective measure by saving energy. The greenhouse gas CO₂ is produced when fossil fuels are burnt in order to generate electricity from coal-fired power plants, propel a vehicle, or power an aircraft flying from A to B. Carbon dioxide is generally accepted as the most important greenhouse gas and it therefore makes sense to decrease CO₂ emissions directly by saving energy strategically in our immediate surroundings as airport operators. Secondly, we are involved in joint ventures in the aviation-traffic industry to reduce overall CO₂ emissions. Aircraft are a much greater problem than airports and ways need to be found to significantly reduce their emissions.



1 |

Let's start with the primary focus: The airport is an area where Fraport can exert control directly. How do you approach this problem?

The first question that inevitably arises in this context is: Where can we save energy? This remains the crucial issue given that most of the energy consumed in the world today is still generated from fossil fuels. At Frankfurt Airport, Fraport is primarily responsible for the infrastructure and aircraft handling. This means that we work on enhancing energy efficiency, improving air-conditioning, and optimizing the lighting in the buildings. One example of progress in this area is the operation of vehicles and ground support equipment with minimum fuel consumption on the apron.

You need large amounts of electricity produced elsewhere in order to run the airport. Is this included in the airport's CO₂ footprint?

Of course. Although we have made sure that we will only be using energy produced from renewable energy sources in the years 2008 to 2013, mostly in the form of hydropower.

Can you verify that?

The green electricity that we receive is certified by the German Technical Inspectorate TÜV Süd.

What are the other areas where the airport can cut down emissions?

CO₂ reduction does not, of course, simply involve saving energy, even though that is very important. We like to think beyond this and look at renewable energy that we can generate directly here at the airport, such as geothermal power which may be accessible at Frankfurt Airport due to the unique geographic location. We are currently conducting preliminary feasibility studies that have yielded some positive results. When it comes to "CO₂ reduction through system change", we are international frontrunners for arrivals and departures.



2 |

Are you talking about the "Frankfurt Airport intermodal traffic hub?"

Exactly. Frankfurt Airport is one of the few airports worldwide with regional and long-distance train stations that are perfectly linked up with the rail network. Freight trains will soon be able to dock in CargoCity South. All in all, this represents a hugely important opportunity to take freight off the road and make better use of the railway system, which is of course more energy-efficient. A further example in this area is exploiting the potential of the ICE high-speed trains to replace short-haul flights, which used to serve as feeder-flights, for example from Cologne or Stuttgart.

Let's come to the aircraft, which are the main source of CO₂. They belong to the airlines and this takes them outside Fraport's area of responsibility.

I have two comments on this issue. It's true that aircraft produce the greatest volume of CO₂ emissions within our sector of the aviation industry. However, these emissions are low when compared with emissions from road traffic and power-generating companies. Aircraft emissions only make up around 2% of global carbon-dioxide emissions. Even shipping traffic creates more CO₂ than air traffic. My intention is not to sideline our role but I should like to put the dimensions in perspective. As far as the relationship between airports and aircraft is concerned, it is indeed the case that Fraport doesn't own a single aircraft. However, the CO₂ emissions generated by aircraft during the Landing Take-off Cycle are attributed to Frankfurt Airport. This means that a large share of our carbon footprint is produced by aircraft which are operated outside our direct control.



1 | 2 |

Dr. Peter Marx (right) talking to Dr. Mike Schwarz.

Could you quantify this?

During the benchmark year 2005, Frankfurt Airport emitted a total of some 1,660,000 tons of CO₂. If the aircraft were left out of the equation, the amount would be much less. In other words, more than half of the carbon-dioxide emissions attributed to our aircraft originate from aircraft.

Does calculating emissions on this basis seem fair to you?

This practice is an international convention. The same approach is taken in the case of aircraft noise. Airports are held accountable for the noise they cause, even though the aircraft and hence the airlines are actually responsible for causing the noise.

And how do you deal with this issue as an airport operator?

As I said before, we're also involved in a joint approach with-in the industry in addition to our program of reducing CO₂ within our direct sphere of influence here at Frankfurt Airport. Joining forces with other players in the aviation industry is directed towards cutting down CO₂ emissions overall. Objectively speaking, making collaborative efforts involving all system partners within the aviation industry is the only way of achieving success in protecting the climate over the long term.

This sentiment is always being put forward by the industry but there is a general sense everyone is passing the buck when it comes to the question of responsibility.

That argument doesn't apply here. Let's take our new IT system as an example. This system allows us to optimize taxiing traffic and departure sequences and reduce kerosene consumption as a result. Then there's the landing procedure we have implemented at Frankfurt for air traffic at night known as the Continuous Descend Approach (CDA). We devised this approach to reduce aircraft noise. At the same time, this saves up to half a ton of CO₂ per flight compared with conventional landing procedures. The optimization of taxiing traffic and CDA are extremely complex projects that can only be implemented jointly, involving airlines, air-traffic control, airports and regulatory authorities.

"...Objectively speaking, making collaborative efforts involving all system partners within the aviation industry is the only way of achieving success in protecting the climate over the long term."

*On the other hand, 500kg of CO₂ is a comparatively small amount.*

Let me give you another example. Lufthansa has been urging Fraport to expand Frankfurt Airport for over 10 years. Capacity constraints on the ground are one of many reasons for this need. These constraints lead to delays and this forces aircraft into holding patterns where they needlessly release CO₂ emissions into the atmosphere.

Is this amount really significant in quantitative terms?

We believe this is the case. Lufthansa demonstrated to us that this problem results in an additional 11 million tons of CO₂ being emitted in European airspace every year. Added to this are the extra kerosene costs which customers ultimately pay for.

Then let me ask this question: Is an environmental management organization focused on a single business capable of implementing advanced environmental protection in this day and age?

Fraport Environmental Management has been organized to operate across companies and on an interdisciplinary basis right from the start. We in Frankfurt are responsible for an airport where more than 500 other companies and authorities are operating. We have to cooperate with all of them if we want to achieve a satisfactory outcome. And one of our basic statements for many years has been that environmental protection does not stop at the airport perimeter fence. The Noise Abatement Program has to date fitted over 8,000 homes and public buildings, such as kindergartens, schools, and retirement homes, with structural noise insulation. This is an example of an initiative that extends beyond the confines of the airport. We have been working closely with the airlines, German air-traffic control and relevant authorities to reduce noise for many years. I believe that this collaboration is set to increase in the future. More and more suggestions for noise abate-

ment, air pollution control, and emissions reduction have been put forward by the German Air Transport Industry Initiative (Initiative Luftverkehr für Deutschland). A number of organizations including the major players in the sector, Lufthansa, German Air-traffic control (DFS Deutsche Flugsicherung), Frankfurt Airport and Munich Airport are members of this initiative.

Environmental protection knows no boundaries. We mostly see globalization as an economic phenomenon. Does environmental protection have any chance of keeping up?

It must. This requirement is self-evident for climate protection. National or corporate borders are irrelevant for the CO₂ emitted into the atmosphere. This fact was obvious at the latest when production of CFC's (chlorofluorocarbons) was discontinued on the basis of an international agreement. Environmental protection is often associated with a global dimension, for example when it comes to issues like climate protection or aircraft noise. Aircraft noise is relevant because we will introduce new night-time flight restrictions after construction of the new north-west runway has been completed. This means that flight departure times for aircraft traveling to FRA will need to be rescheduled to off-peak and night times at their departure points, leading to night-time aircraft noise being "exported". This also applies to aircraft departing from FRA. One conclusion that Fraport has drawn from our global commitments relates to the composition of our group-wide Environmental Policy which came into effect in the spring of 2008. This is underpinned at Frankfurt Airport with relevant environmental principles.

What would you envisage under this?

Fraport is currently one of the largest airport operators in the world. This role entails a great deal of responsibility and we exercise this responsibility by focusing on our company's sustainability. In practical terms, this means that we have committed ourselves to working closely with our stakeholders to maintain and develop specific economic, social, corporate, and ecological standards. These ecological standards are formulated in our corporate Environmental Policy and they are effective within the framework of our Fraport Sustainability Strategy. This policy relates to Frankfurt Airport and all other national and international airports in which we hold shares.

Dr. Marx, perhaps we could get a brief perspective on the future. After all, forecasts are indispensable tools for the aviation industry. Would you like to tell us what environmental protection will look like in the sector and at Fraport by the year 2020?

Perhaps you would allow me to make a minor adjustment. Forecasts are forecasts and not prophecies. Scenarios like this are essential for our planning processes but they're not necessarily an automatic reflection of the reality of tomorrow. Quite apart from this, I'm assuming that at some time

in the years to come, there will be a global emissions trading system for the air-transport industry targeted towards global reduction of CO₂ emissions by aircraft. We have no idea of the extent to which the Europeans will move this issue forward, what role the ICAO will play as the UN organization of global civilian air traffic, or what stance the USA will take on issues relating to climate protection, or what will be happening in China and India with respect to climate protection. However, we will get an international agreement because it is absolutely essential on objective and ecological reasons in view of the growth in air traffic, most importantly in Asia.

"... we will ensure that growth of these environmental impacts is not proportional to growth in air traffic."

And what will be happening in Frankfurt? And at Fraport?

Frankfurt Airport is being extended following ten years of preparation. The basis for this is the resolution on the Zoning Plan procedure which includes a large number of regulations that we have to comply with as airport operator: noise abatement, night flight restrictions, air hygiene, nature conservation, reforestation, coherence measures in the surrounding woodlands, regulations for the construction period. Given the large number of details we will have to deal with, it's vital that we should never lose sight of our key objective. And that is about separating growth in traffic from environmental impacts. It's obvious that more traffic will entail an increase in environmental impacts. This is inevitable, however, we will ensure that growth of these environmental impacts is not proportional to growth in air traffic. Fraport as a corporate group will continue to play a proactive role in the standing committees, organizations and task forces at international level. We will advocate the inclusion of Europe's high standards for environmental protection in consultations and seek to ensure that they are implemented as comprehensively as possible.

Dr. Marx, thank you very much for your comments. ■

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Unless otherwise specified, the details of this Environmental Statement are based on internal data that has been directly or indirectly collected by Fraport.



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Global – Ecological – Sustainable



The foundations of the current Fraport Environmental Strategy were defined in the Fraport vision which identified three corporate goals: value creation, strong performance, and sustainability. The corporate goal of sustainability has gained increased importance in recent years and this is how Fraport came to join the Global Compact initiative. This was established by the United Nations and obliges participating companies to make their special contribution toward creating “more fair-minded and sustainable global economy” by implementing universal human rights and environmental principles. Fraport has formed a group-wide sustainability board as an organizational result of this initiative.

Corporate sustainability goal – Environmental Management in conformity with EMAS

Within this strategic context, environmental protection at Fraport is a sub-goal of the corporate goal of sustainability. This assigns special significance to activities associated with environmental protection at all locations. They are set up for the long term and are based on ecological criteria. In practical terms, this means that the strategic approach needs to be robust enough to stand up to expert external scrutiny and any measures must be designed with an appropriate level of transparency. This target has been met at Frankfurt Airport by validation of the location in conformity with the Eco-Management and Audit Scheme (EMAS) and certification of Fraport Environmental Management in conformity with ISO 14001. Where Fraport holds stakes in or has management contracts with other national and

international airports, some certificates have already been awarded in conformity with ISO and preparations for certification are being made at other locations.

Fraport vision statement on the environmental protection sub-goal

The key elements of Fraport’s environmental strategy are defined in the Fraport vision statement that is set out in the environmental protection sub-goal:

“We are dedicated to environmental protection and environmental compatibility at all Fraport locations with the aim of conserving our natural resources. Our commitment to environmental excellence exceeds legal requirements. We believe that environmental protection is an issue that transcends the airport boundaries.”

This vision is about more than simply complying with statutory environmental regulations, even though the legislation in many countries such as Germany has become extremely tough. Moreover, Fraport Environmental Protection continues beyond the airport perimeter fence and includes the surrounding region. Against this background, the Fraport group is involved in the Global Reporting Initiative GRI and advocates a global, accredited aviation industry standard for the presentation and evaluation of sustainability issues. Overall, the principle of a sustainable environmental strategy can be summarized with two concepts: direct responsibility and transparency.

The expansion of the Fraport Group opens up a new dimension for the challenges of environmental protection.

Successful initiatives for the airport's key environmental issues – aircraft noise and climate protection – can only be developed within a sustainable strategic approach, and this needs to be implemented on a global scale.

Fraport focuses on a long-term environmental strategy

Aircraft noise: a balanced approach

Even though climate protection is currently the focus of public awareness, aircraft noise is still the most important environmental issue at most airports. Fraport Environmental Management at Frankfurt Airport takes a balanced approach when it comes to aircraft noise, aiming for a strategy that takes full account of the whole range of issues involved. The overarching goal for this sector is:

"In view of the projected growth entailed by expansion at Frankfurt Airport, Fraport will seek to uncouple the increase in airborne noise from the increase in air traffic."

A wide range of technologies, procedures and measures are required to achieve this goal, and these are being discussed, developed, and implemented not only in Frankfurt but in all major airports worldwide. Numerous airports across the world are members of the Airports Council International (ACI), which has taken responsibility for this. Airport representatives discuss their environmental strategies and the associated measures and experiences in the ACI World Environment Standing Committee. ACI is strongly anchored in the civil aviation organization of the United Nations, the International Civil Aviation Organization (ICAO). This process of debating strategies and discussing experiences means that the environmental strategies of the majority of airports and airport operators are formulated in a similar way and the means of implementation are also applied similarly. ACI's balanced approach to aircraft noise is in line with ICAO recommendations:

- Reduction of noise emissions at the sources of noise – i.e. primarily in the aircraft
- Noise optimized residential and route planning – no residential settlement in areas with significant exposure levels and rerouting of take-off and landing routes away from densely populated areas
- Noise optimization in operational processes – in the air (i.e. in the landing and take-off cycle of aircraft), and in the ground procedures
- Introduction of appropriate regulations – e.g. special night flight regulations

All these initiatives have been adopted at Frankfurt Airport and other airports operated by Fraport. However, it is important to remember that effective aircraft noise management is based on the systematic partnership between all parts of the air-traffic industry: the airports, airlines, air-traffic control, regulatory authorities, and indirectly the aircraft and engine manufacturers. Reliable data constitutes an essential foundation for any noise abatement activities. In Frankfurt, this is collected by the aircraft noise monitoring system operated by Fraport. The collection of dependable aircraft noise data and continuous optimization of monitoring systems is a top priority at all airports operated by Fraport.





Fraport has been addressing environmental and sustainability issues within the German Air Transport Industry Initiative (Initiative Luftverkehr für Deutschland) – an initiative founded in 2003 and made up of the German Air Traffic Control (DFS Deutsche Flugsicherung GmbH), Fraport AG, Deutsche Lufthansa AG, and Munich Airport. In 1974, Frankfurt Airport became the first airport in the world to offer airlines financial incentives for using quieter aircraft and the noise-reducing “low drag – low power” procedure – which became known at the Frankfurt Landing Procedure. Since 1993, noise-based airport landing fees have been levied on the basis of the category of the aircraft within the ICAO noise classification. In 2001, seven noise categories were defined on the basis of aircraft noise actually measured. There are now eight categories for each aircraft type with a scale of noise components distinguished according to day and night times. An additional incentive was created on January 1, 2008 with the introduction of noise category 0 (lowest noise category).

Climate protection: reducing CO₂ emissions

CO₂ is the most important greenhouse gas and it exerts a decisive impact on global warming. Effective climate protection therefore needs to address reduction of this gas as its top priority and identify means of drastically reducing CO₂ emissions worldwide. The part played by the air-traffic industry in this context is often exaggerated. The latest surveys and projections suggest that the air-traffic industry’s contribution to global CO₂ emissions is approximately 2 – 4 percent. However, air traffic is expected to grow in the future and this will inevitably be associated with a rise in CO₂ emissions. The air-traffic industry has accepted this challenge and agreed at ACI’s 3rd Aviation and Environment Summit to take the necessary measures to reduce the negative impact on the environment while also working towards sustainable development of their global networking. The declaration – which was signed by Fraport for the

entire group – makes an appeal to the governments of the delegate countries to support the development of a global emissions management program through ICAO.

If all air traffic procedures are analyzed as an entity, airborne aircraft is the biggest source of emissions.

However, airports also contribute to CO₂ emissions: electricity consumption, heating and cooling, shuttle and service traffic, and the use of all types of machine and equipment. ACI recommends an integrated and long-term strategy for airports in this context. The main options for change are presented below:

- Promotion of activities directed towards reducing CO₂ emissions in areas where the airports have direct control or can exert effective influence
- The main starting points for action are the LTO cycles as well as aircraft taxiing traffic and the emissions from service vehicles on the apron
- Further scope is provided by increasing efficient use of energy in airport buildings in order to allow a further reduction in emissions

Fraport is also involved in the ambitious goals and measures set out by the German Air Transport Industry Initiative (Initiative Luftverkehr für Deutschland) to reduce CO₂ emissions.

Fraport’s 2020 climate strategy

Fraport is developing a “2020 Climate Strategy” for initial implementation at Frankfurt Airport over the upcoming years. Intensive work is also being carried out at the other airports in the group to optimize the CO₂ footprint. Rising energy prices are playing a role here because they are one of the key business drivers for avoiding CO₂ emissions.

Sustainability: a key factor in successful growth

Sustainability as a corporate goal of Fraport entails directing corporate strategy towards long-term stability with more cost-effective, more socially oriented and more ecological outcomes. As one of the most important airport operators in the world, Fraport also has to take into account fundamental market trends and the requests of the traveling public for a high level of individual mobility. Increasing capacity problems at Frankfurt Airport placed the company under intense pressure to take appropriate measures enabling it to deliver air traffic that meets the requirements of the marketplace as well as meeting the requirement for sustainability. Construction of a new runway and a new terminal will make a big contribution to this aim and ecological criteria will be one of the key defining aspects of the development.

Inclusion in sustainability indexes

Inclusion of the Fraport share in the most important global sustainability indexes – FTSE4Good, DJSI STOXX, DJSI World, SAM Bronze Class 2008 – bears testimony to the success of the company's sustainability strategy.

Environmental Statement awarded accolade of best German environmental publication

Another noteworthy achievement was the DURA Award (Deutscher Umwelt Reporting Award), commending the previous Fraport Environmental Statement as the best German environmental publications. The judging panel acknowledged the Environmental Report as "a mirror of the effort to enhance transparency and foster dialog".

Environmental management – an important element in the sustainability strategy

Fraport Environmental Management plays a key role in implementing the Fraport sustainability strategy. Its function is to enable the operating units to structure the operational processes they are responsible for with maximum environmental friendliness. The focus of our activities is on conservation and careful management of the natural resources of soil, biodiversity, water and air, combined with increasing energy efficiency and reduction of emissions – including atmospheric pollutants and greenhouse gases. Environmental management also targets the key area of aviation noise, which many residents living in the vicinity perceive as the biggest environmental pollutant emanating from the airport. The methodological foundation for Fraport environmental management is the Environmental Management System (EMS).

A systematic approach to sustainable environmental management

According to ACI, an Environmental Management System is the most important requirement for sustainable environmental management. This is why all airports are recommended to adopt an Environmental Management System. Experience at Frankfurt demonstrates that an Environmental Management System at a major airport is not a static construct but needs to be seen as a process that is continually having to be adapted to changing conditions and requirements. The key activities of Fraport Environmental Management are advancing the Environmental Management System at Frankfurt Airport and guiding the establishment and development of Environmental Management Systems at other airports within the group. Lima, Frankfurt-Hahn and Hanover already have the appropriate systems in place. Project teams at Cairo, Delhi, Antalya, Varna, and Burgas are currently in the process of creating an Environmental Management System. ■



FRAPORT LAUNCHES A PROGRAM FOR REDUCTION OF CO₂ EMISSIONS AT FRANKFURT AIRPORT

Climate protection goals of Fraport AG:

- 1 | 30 percent¹⁾ reduction of carbon-dioxide emissions by 2020.
- 2 | Airport expansion to be CO₂ neutral.

Climate protection at the airport



¹⁾ Per "Traffic Unit" (equivalent to a passenger with baggage or 100 kg of cargo or mail)

Global climate change and the measures to prevent further change have become the key theme of environmental protection. Against this background, Fraport AG formulated climate protection goals for Frankfurt Airport in spring 2008 which are intended to bring about a significant reduction in CO₂ emissions. This means that Fraport is also making a decisive contribution to the Local Energy Initiative Frankfurt (LEIF).

A global problem that affects everyone

Something that seemed inconceivable a few years ago has now become part of everyday life. Global warming and the associated measures for more climate protection are increasingly determining the lives of us all. Since climate change and the CO₂ emissions generated by the combustion of fossil fuels are directly linked, we are increasingly being confronted with the need to take decisions that have effects which are more far-reaching than was ever obvious in the past. One fact that is forcing us to address this issue is the sharp rise in the prices of oil, gas and electricity. This starts with selecting a new energy-saving fridge and certainly doesn't stop when the decision is taken to buy a new car with reduced consumption and emission values. What kind of lighting should I buy? What type of accommodation should I move into? What kind of house do we want to build? What heating system

will pay off today and in the future? What form of transport should I use? Where should we spend our next holiday? The answers to these and other similar questions are increasingly associated with energy consumption, emission reduction and climate protection.

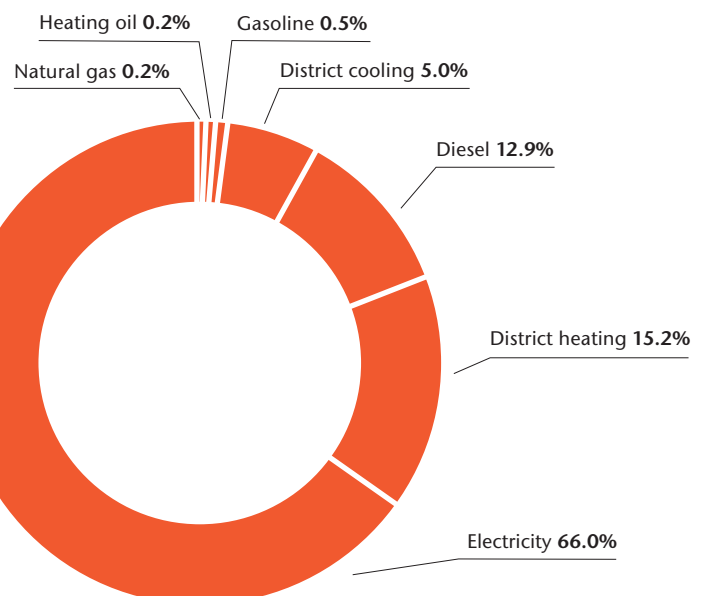
Fraport confronts new challenges

The public is not alone in facing new challenges when it comes to taking decisions on issues relating to climate protection and energy savings. Companies also need to reduce their energy consumption and adapt their energy supply to the changes in the economic and ecological environment. This challenge has a particularly significant dimension as far as Fraport AG is concerned. Frankfurt Airport is one of the biggest and most important airports in the world and as the operating company running the airport,



Origin and proportion of CO₂ emissions from Fraport AG

FRA site 2007



Climate protection goals of Fraport AG

1. Specific CO₂ emissions reduction goal (baseline year 2005 – target year 2020):
Minus 30 percent for each traffic unit of Fraport AG at the FRA location.
2. The airport expansion is carried out CO₂-neutral, i.e. in the year 2020, Fraport AG emits no more CO₂ at the FRA location than in 2005 in absolute terms.

Fraport needs to define the strategic direction of energy management in such a way as to safeguard the success of the location and the economic prosperity of the surrounding district for the future.

Analyzing the core data of the location demonstrates the multifaceted nature and complexity of this function. Frankfurt Airport has the energy requirements of a big town with some 100,000 citizens as a result of approximately 70,000 jobs, up to 185,000 air passengers at peak times every day, and comprehensive logistic and maintenance facilities. The most important energy consumers at the airport are electricity, district heating and district cooling. Despite the rising volume of air traffic at the airport,

energy consumption there has remained virtually constant in recent years. This is down to enhanced energy efficiency which is calculated on the basis of traffic units (one traffic unit is equivalent to one passenger plus baggage or 100 kg of cargo or mail). However, independently of this, an increase in total energy consumption is projected for the coming years due to the planned expansion of the airport.

Climate protection targets for the FRA site

In spring 2008, Fraport AG formulated its new climate protection targets for Frankfurt Airport. The airport operator stated its intention of continuing

to gradually reduce CO₂ emissions at the location over the coming years. While CO₂ emissions in the year 1990 still amounted to 6.2 kilograms per traffic unit, this fell to about 3.6 kilograms for each traffic unit by the year 2005. This corresponds to a decline of some 40 percent. A significant drop of 30 percent for each traffic unit on the figure for the baseline year 2005 is the target by 2020 and this goal is to be achieved by optimizing business processes. A further target is to keep CO₂ emissions created by Fraport AG at the airport through the supply of energy in the year 2020 at the same level as 2005, despite the expansion of the airport.



* Per "Traffic Unit" (equivalent to a passenger with baggage or 100 kg of cargo or mail)

Strategic climate protection measures defined by Fraport AG ¹⁾

1. Fraport supports the aims of the German Air Transport Industry Initiative (Initiative Luftverkehr für Deutschland) on the issue "Single European Sky" (SES).²⁾
2. Fraport supports the objectives of ACI Europe for CO₂-neutral operation of airports.
3. Fraport is investigating the use of geothermal energy.
4. Fraport will demonstrate with Terminal 3 that an environmentally friendly terminal is also feasible in commercial terms.³⁾
5. Fraport uses electricity from renewable sources for the years 2008 - 2013 (2014ff still no trading).
6. Fraport sources district heating from highly efficient cogeneration (i.e. 60 percent CO₂ savings compared with conventional heat generation in conventional heating power stations).
7. Fraport offers third-party companies at the location the opportunity to take electricity from renewable sources for the years 2010 – 2013.
8. Fraport mobilizes staff to take energy-aware action.

Savings at the terminal

The two fully air-conditioned passenger terminals represent an important starting point for saving energy. They are the biggest consumers at the location using 198 million kWh (status 2007), representing 70 percent of the overall electricity consumption at Fraport AG. Starting in summer 2005, control of the operating hours for the air-conditioning was optimized in the more recent Terminal 2. In the older Terminal 1, a project entitled "Upgrade of Technical Control Centers" has been introduced. This is testing and analyzing the potential of energy-saving measures.

Climate protection through efficient control of vehicles and aircraft on the ground

An additional potential for reducing carbon-dioxide emissions is in the field of ground processes. The vehicles required on the apron can be deployed more efficiently by using new IT systems. The „Airport System for Transport and Operations“ (ASTRO) currently being developed can save an estimated 500 tons of CO₂ each year.

Aircraft taxiing movements also offer the potential for a further CO₂ reduction. Owing to the high utilization of the entire system, taxiing and waiting times are continually being incurred in this area. The introduction of Depart-

ment Management is intended to gradually alleviate this problem. The resulting potential for CO₂ savings here are estimated at around 14,400 tons.

Intermodal hub FRA

Another asset of the airport for CO₂ savings are the excellent connections to the rail network. The intermodal hub at Frankfurt Airport has its own long-distance train station and a regional station, and rail connections have already been built at CargoCity South. These will be operational from the third quarter of 2008 and will be used by express freight trains. They will replace up to 10,000 truck journeys between Frankfurt and Leipzig each year. A growing number of passengers are using the long-distance station to and from the airport who would otherwise use their cars or book a short-haul flight. In the year 2007, 17 percent of air passengers used the ICE. The regional station has also contributed to CO₂ reduction for many years and has played a role in avoiding the creation of air pollutants. Out of 34 percent of airport passengers who opt to use public transport, around one third arrive or leave by this mode of transport. The calculated intermodal use by passengers yields CO₂ savings amounting to 100,000 tons each year. Moreover, approximately 38 percent of some 70,000 employees at the airport use public transport to travel to work. Around 7,100 employees at

Fraport AG take advantage of a job ticket, with the company spending 190,000 euros on this scheme each month. This means that Fraport employees alone avoid 6,300 tons of CO₂ each year. If we extend this result to the entire FRA location and all the employees working here, this represents at least 35,000 tons. New projects like the CARRIVA Carpool will given even more airport commuters the opportunity to stop using their private cars without having to lose a disproportionate amount of time.

Clean electricity plus on-site energy generation

Electrical energy plays a key role in the climate-protection strategy at the airport. The Fraport subsidiary Energy Air supplies the entire airport with electricity. Starting in 2008, this utility will supply Fraport with electrical energy that is 100 percent certified and generated exclusively from renewable sources. Currently, the sole source is hydropower. During the years 2008 and 2009, this measure will make annual CO₂ savings of some 185,000 tons, and Fraport AG is projecting 200,000 tons of CO₂ savings each year between the years 2010 and 2013. In addition, third-party companies operating at Frankfurt Airport will be offered certified eco-power from 2010 onwards.

¹⁾ See chapter: Environmental information. ²⁾ See also chapter: "Investments in sustainable environmental protection".

³⁾ See also chapter "Efficiency rather than ostentatiousness".

This latest move has the potential to reduce CO₂ emissions generated at the airport by a further 70,000 tons each year.

Another extremely promising prospect relates to generating alternative energies directly at the airport. This includes the exploitation of geothermal energy, i.e. energy generated by heat stored in the earth. If the preliminary feasibility analyses currently being carried out have a positive outcome, this project could save around 22,000 tons of CO₂.

Practical testing of future-proof technologies

Solutions with lower CO₂ emissions or none at all are also the aim for the fleet of vehicles operated at the airport – for example with increased use of state-of-the-art mobile ground support equipment for handling aircraft, and the use of electric vehicles. Vehicles with hydrogen-powered fuel cells are also being tested, a project lasting from the end of 2006 to the end of 2009. The big advantage of this future-proof technology is that these cars neither emit the greenhouse gas CO₂ nor emit any other pollutants.

The majority of new buildings constructed on the airport site are to use low-energy methods of construction. In the case of renovations and refurbishments, any potential for energy efficiency that has already been determined should be exploited to

the maximum extent. Furthermore, stationary ground power supply for aircraft and the use of all types of light sources are to be optimized for maximum energy savings.

On technical grounds CO₂-neutral growth at the airport no longer represents a utopia. The only issue at stake is price. In view of increasing energy costs and the fact that fossil fuels constitute a finite energy resource that will run out within the foreseeable future, we will soon be in a position where investments in new alternative energy sources and intelligent energy management will also be worthwhile on commercial grounds.

Joining forces in the Local Energy Initiative Frankfurt (LEIF)

There are many different opportunities to save energy and hence make an effective contribution to climate protection – but there is often a long lead time before the practical applications are realized. It is therefore desirable to facilitate an intensive exchange of ideas among responsible managers and experts in practical applications. This is why Fraport is involved in the Local Energy Initiative Frankfurt (LEIF) which is sponsored by the EU Commission within the scope of the BELIEF project (Building in Europe Local Intelligent Energy Forums). LEIF was set up in 2006 as a forum intended to strengthen environmentally friendly use of energy at the FRA location. Participation is open to anyone

dedicated to saving energy and to climate protection: individuals, groups of people, associations and societies, companies and authorities which are affected in a wide range of different ways and are willing to make contributions derived from their experience.

The contribution made by Fraport to LEIF is particularly important in this context. The airport is one of the showcase locations which will play a key role in deciding whether the climate targets set by governments can be achieved. Although these specifications vary, the targets are undoubtedly ambitious. The EU is aiming for a 30% reduction by 2020 measured against the CO₂ emissions generated in the year 1990, while the German government is even planning a CO₂ reduction of 40 percent. CO₂ emissions generated in the state of Hesse amounted to 44.6 million tons in 2002 and the state is planning a cut of eight million tons by 2012. The climate protection concept adapted by the city of Frankfurt envisages an ambitious CO₂ reduction target of 20 percent over the next ten years, even though there are numerous obstacles. Fraport will make a contribution with a wide range of measures directed towards protecting the climate. ■

Fraport reports on CO₂ strategies in the Carbon Disclosure Project

Fraport has been participating in the Carbon Disclosure Project since 2006. This is the biggest global initiative in the financial sector to analyze the effects of global climate change on companies and their strategies. The aim is to create more transparency in CO₂ emissions that have negative impacts on the environment. 300 institutional investors across the world supported the project in the year 2007. These investors manage assets totaling 41 trillion US dollars.



Climate protection: *forecasts and solutions*

Climatologists have been observing an increase in the temperature of the earth's surface and the earth's atmosphere for a considerable period of time now. These changes are the result of the phenomenon commonly referred to as the greenhouse effect. The current cause of this effect is identified as the increase in greenhouse gases such as CO₂, which have been released into the atmosphere in steadily increasing volumes since the start of the industrial revolution and the increased use of fossil fuels, notably coal and oil. These emissions rise into the atmosphere where they are disseminated and cause the earth to heat up due to increased absorption of long-wave infra-red radiation. The foreseeable consequences of this process are global climate change, an increase in extreme weather conditions, melting of large ice fields at the poles, and a rise in sea level. Coastal settlement areas and global food production are at particular risk from these geographical changes.

Climate change is a fact but it is still possible to slow down the process of change over the coming years and decades. During the twentieth century, the average temperature worldwide increased by 0.74°C. Climate researchers and the Intergovernmental Panel on Climate Change (IPCC) set up by the UN are predicting that the earth's temperature may increase by three degrees Celsius during the 21st century if no action is taken to reverse the trend. The objective is therefore to reduce this value. The simplest and most effective lever is to bring about a significant reduction in the CO₂ generated by human activities. While carbon dioxide is a naturally occurring constituent of the atmosphere, around 42 billion tons of CO₂ are currently being produced each year as a result of combustion processes initiated by humans: power plants, industrial facilities, heating, road traffic, shipping, aircraft – with air traffic only causing around two percent of global CO₂ emissions. Nevertheless, the assumption is that the volume of air traffic will continue to grow in the future and aviation's share of global carbon-dioxide emissions would rise accordingly – if nothing is done to counteract this trend.

Since CO₂ stays in the atmosphere for around 100 years, fast action is needed. That's why the European Union is planning a number of measures including the incorporation of European air traffic within the European emissions trading system with effect from 2012. The objective is to achieve a reduction in the CO₂ emitted by air traffic as quickly and efficiently as possible.

Fraport welcomes this emission trading system since it is an ecologically more efficient and commercially more effective measure to reduce the impact of air traffic on the climate than a tax on kerosene or a ticket tax. However, it is important to find a practical global solution for integrating air traffic within emissions trading. This must have a fair structure that is competitively neutral and includes all the competitors in the sector. Any isolated introduction of this system, which is restricted to specific regions, will lead to distortions in competition and will at best only exert a marginal effect on climate protection.

Hitchhike to the airport: CARRIVA Carpool Club tests concept for commuters

Every day the same picture. Hundreds of cars are traveling on the roads and motorways around Frankfurt. They are all heading towards the airport where their occupants work. Occupants? Generally, there's only one person sitting behind the steering wheel while the other seats in the car are empty. Actually, it would make sense to form car pools in order to save money and relieve the burden on the environment. But that seems rather unrealistic in view of flexible working times, employees living in different places and the sheer size of the Frankfurt airport complex.

The CARRIVA car-pooling model offers a solution to this difficult problem. This model was developed by e-Notions with the scientific support of the Institute for Future Studies and Technology Evaluation (Institut für Zukunftsstudien und Technologiebewertung, IZT) and sponsored by the German Transport Ministry as part of the initiative "Mobility 21". The basic idea of this pilot project is simple. Commuters at Frankfurt Airport can use the Internet to register in a database, giving the route they drive along and their cellphone number. If someone is looking for a car pool, registered commuters can send out a system request by cellphone which is immediately forwarded to a telephone link with a passing driver or carpool member. The pick-up point and time can then be agreed directly.

Let there be light: Fraport develops passenger stairs with solar collectors

When aircraft are parked in their apron positions, mobile passenger stairs provide the link between the cabin and the ground or the bus transfer. The passenger stairs are partly covered with a roof at Frankfurt Airport to provide more comfort for passengers, and they are illuminated during the hours of darkness. In order to supply the lighting system with electricity, the passenger stairs have their own batteries which used to have to be removed regularly, charged up in the workshop, and then installed again. An ideas team from the Fraport vehicle workshop considered this to be a waste of resources.



Innovation prize for Fraport Team: emergency electricity with minimum emission

The "Xplore New Automation Award" is an innovation prize advertised internationally. It is awarded every three years for future-oriented project developments in technical disciplines. In 2008, first place in the ecology section went to a young team from Fraport who had developed a backup power supply with fuel cells and a mains-synchronous reset at the Werner-von-Siemens-Schule (technical school for electrical engineering) in Frankfurt. An airport needs to have a certain number of backup power units to guarantee electricity supplies if the mains electricity supply fails. Currently, diesel units are used, but they emit comparatively large amounts of CO₂. The three young Fraport employees Jens Gommermann, Marcus Keimling and Christian Eller carried out a project study to establish the extent to which fuel cells powered by hydrogen are suitable for emergency power supply. One advantage of this system is that operation of fuel cells is essentially free of emissions. The judging panel of the "Xplore New Automation Awards" was so impressed with the solution that the Fraport Team came out winner. The team members received their award from the hands of German Economics Minister Michael



The carpool brings a financial benefit because the driver receives a contribution towards costs from the carpool member. The financial transfer is transacted automatically when a car pool is mediated successfully. The ecological benefits are obvious. Increasing the number of people traveling in one car reduces emission of pollutants and noise.

The project has been in preparation since 2005 and was launched in the summer of 2008. The managers responsible for the project hope that people will make a commitment to participating in the scheme. This would contribute towards developing the project into a financially and ecologically attractive alternative to conventional transport options in the Frankfurt/Rhine-Main region within a very short space of time.

The team put forward a proposal in the company's in-house proposal scheme suggesting that the stairs should be equipped with photovoltaic solar collectors. The idea was that these would regularly recharge the batteries. The plan was implemented immediately. Engineers in the Fraport vehicle engineering department developed a prototype that was initially proved in an extended test phase. After a few modifications and refinements had been carried out in cooperation with the manufacturer TEC Hünert, this alternative technology has been deployed together with energy-saving LED lamps at Frankfurt Airport since 2008. Initially, three stairways of this kind were operating, with another twelve to follow by June 2008. If the technology proves to be successful, around 70 existing stairways will be re-equipped. Plans are also being made to equip the existing automated stairways at the airport with solar panels, which would provide the batteries with a buffer for increasing the operational safety. Saving energy, optimizing operating processes, cutting costs: The example of powering passenger stairways with solar electricity demonstrates what energy management geared to operations can achieve.

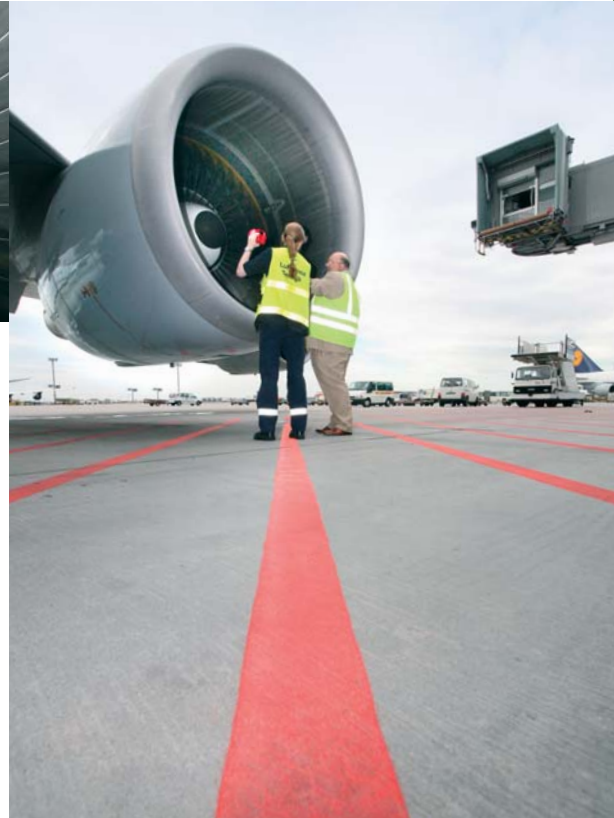
Glos at the Hanover exhibition "Get New Technology First" on April 23, 2008. At the same time, Fraport AG decided to carry out further tests on the fuel-cell system to establish whether it is suitable for possible operational use.

Happy winners (from left): Christian Eller, Marcus Keimling and Jens Gommernann.



INTERVIEW WITH ROLF-DIETER ROLSHAUSEN, AIRPORT CHARGES

Business model with *environmental elements*



Mr. Rolshausen, perhaps you could give us a helping hand. What are airport charges?

Rolf-Dieter Rolshausen: In simple terms, these are charges which an airline has to pay to the airport operator for using an airport.

What exactly does "use" mean in this case?

You can compare the charges with a motorway toll system. In our case, you pay for the use of the landing and take-off runways, the taxiways and the individual parking positions. We use this income for our operational processes, for maintaining and updating the aircraft noise monitoring system, for maintaining the runway system, and to defray such costs as traffic control on the apron, the airport fire service, or the winter service. Expenses for the terminal infrastructure and the increasingly expensive security measures are also paid from these charges.

You are the executive manager at Fraport responsible for airport charges. Perhaps you'd like to let us into the secret of how much money you collect each year?

That's not a secret because our company is listed on the stock exchange.

In 2007, we collected charges amounting to approximately 540 million euros. This is around 30 percent of total income of the Fraport Group.

That sounds like money easily earned ...

...that would be great. But we're operating in a highly competitive market. It's a well-known fact that airlines are experiencing intense pressure on prices and scrutinize our charges very carefully. They want to know down to the last cent what services they are getting for their money and how they can save on charges.

Is it at all possible to cut costs in the age of flat rates?

You can certainly cut costs with us. The most effective way for airline companies to cut airport fees is through the environmental components that we have built into the charging structure.

How does this environmental component operate?

The environmental component is an instrument of control which we use to provide economic incentives for influencing the environmental impact of the airlines in the direct environment of our airport. For example,

1 |

Fraport is committed to ensuring that airline companies use modern aircraft in Frankfurt, which generate less noise than older machines. We therefore say to the airlines: Anyone landing aircraft in Frankfurt which make less noise can save money on charges.

But the environmental component is only part of the charge.

That's right. If you look into the detail, the total amount that an airline has to pay us for a specific aircraft at our airport is made up of several elements. There is a variable share calculated from the number of passengers carried or the airfreight that is transported. And there is a fixed element that



New airport charges introduced for air pollutants

2 |

comprises two components apart from the time-dependent parking charges: the total aircraft mass and the environmental component.

It sounds complicated.

It is complicated, most particularly because the right charge has to be calculated for each individual aircraft.

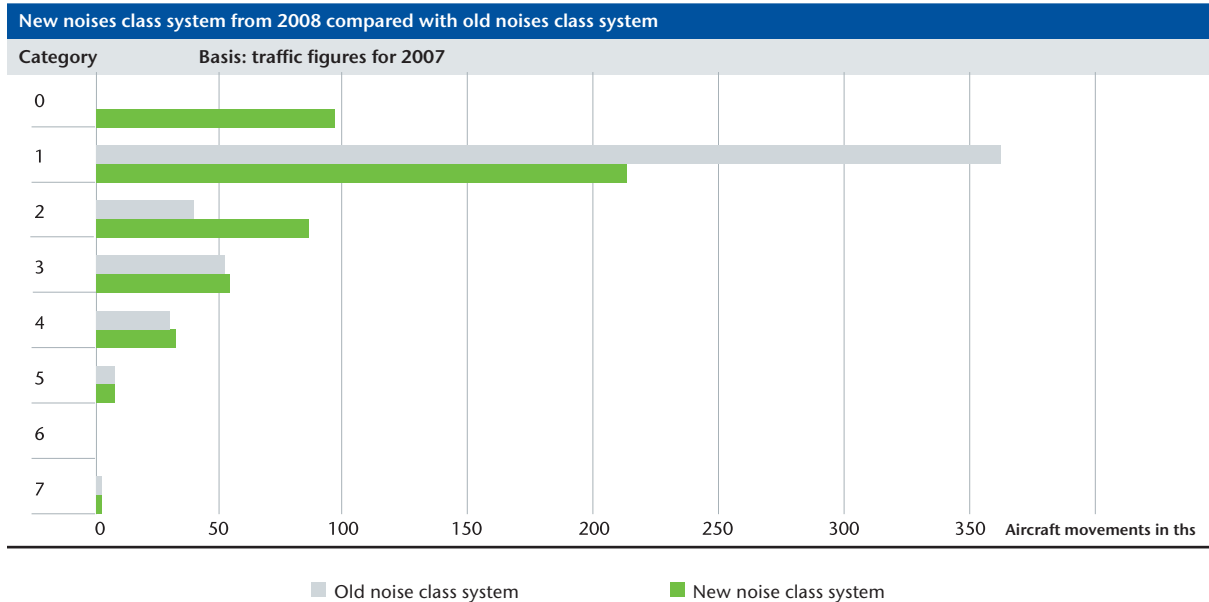
You were referring to the controlling effect of the environmental component and talked about aircraft noise. However, there are also other environmental effects exerted by aircraft, such as emission of atmospheric pollutants.

This is the key issue. Until the end of 2007, the environmental component

was simply a noise component. In other words, we calculated the development of noise for individual types of aircraft here in Frankfurt and classified aircraft according to seven different categories involving a scale of charges on the basis of the amount of noise produced. New rules have applied since January 1, 2008. The new noise category of 0 represents the lowest noise category. This has created an additional incentive for lower-noise aircraft, which don't have to pay a noise charge during the daytime. This means that we now have eight noise classes. At the same time, we have increased the environmental share of the fixed charges from 18 million euros →

1 | 2 |

Rolf-Dieter Rolshausen (right) talking to a Lufthansa engineer.



to 40 million euros and reduced the weight component in exchange. The environmental component has therefore become even more important as a cost factor. Moreover, a new factor has been introduced into the equation. We have started a trial period for an emission component that is determined on the basis of emission of the atmospheric pollutant NO_x (nitrogen oxide) and HC (hydrocarbons).

What were the reasons for introducing this new component?

Ultimately, it was a political decision to introduce the two elements noise component and emission component. Aircraft noise continues to be the number one environmental issue at airports. The noise component gives us certain options for exerting

pressure on the airlines to deploy low-noise aircraft models in Frankfurt. The emission component has a similar aim and you might say that we are sponsoring aircraft which emit less NO_x and HC.

What expectations do you associate with the emission component?

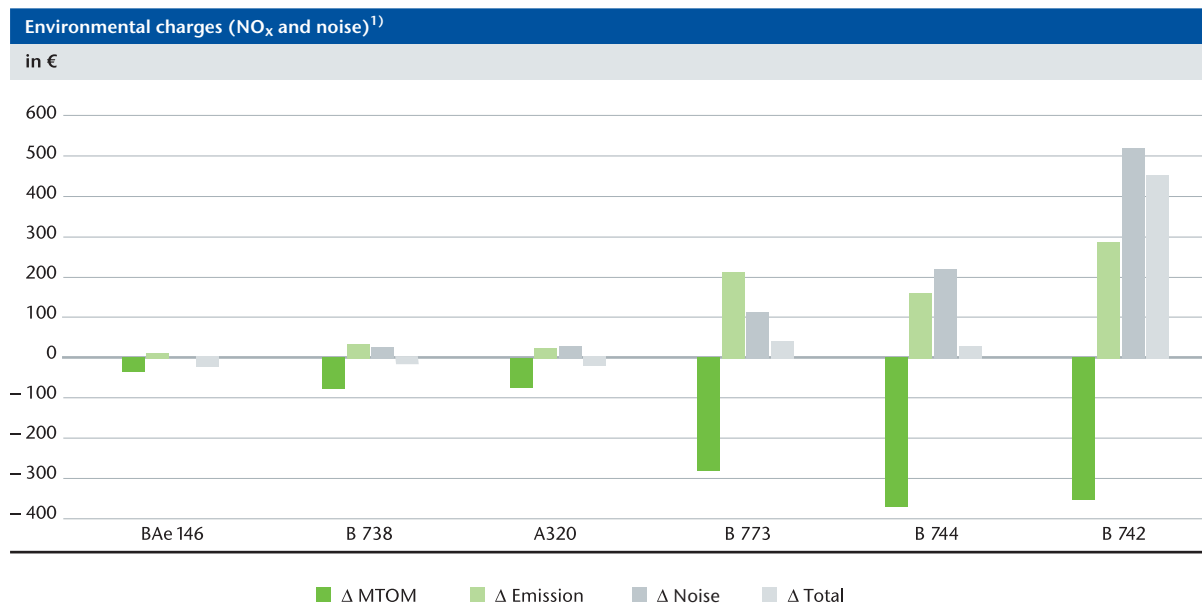
Climate change is the big environmental theme of our time. The most important cause of this is the gas CO₂ which exerts an effect right across the globe. Nitrogen oxides (NO_x) in contrast to CO₂ have a mainly local effect and they are subject to increasingly tough limits in European legislation. NO_x and HC create summer smog when they are impacted by solar radiation. The debate on climate protection that is being conducted globally in the aviation industry has already resulted in a

consensus that it is necessary to take a global approach to global problems while resolving local problems at the local site. The consequence is that the future aim is to control CO₂ emissions generated by the aircraft fleets through an international emissions trading system, while NO_x emissions need to be reduced by airport charges.

But Frankfurt Airport is not the only place where NO_x and HC are a problem.

Correct. It relates to all airports. The charge on emissions amounts to three euros for each kilogram of NO_x equivalent emitted, and it is being tested in Frankfurt and Munich. This represents 50 percent of German air traffic. Each individual flight event is recorded and calculated on the basis of its emissions in the standardized LTO cycle. The volume of emissions is deter-





mined from the relevant combination of aircraft model and engine. The relevant data is accessed from databases and the ERLIG²⁾ formula, which was developed specifically for this purpose. It is conceivable that this kind of emission charge will eventually be levied at all German or even all European airports.

Mr. Rolshausen, you have been working on this issue at Fraport for many years. What do you perceive to be the net result of your work?

As far as I'm concerned, development of the environmental component in our charging system was one of the most exciting challenges during recent years. Of course, you can only come up with a solution for this kind of issue in a team. This is because a large number of technical, commercial and

ecological factors are operating here, which can only be weighted if the relevant experts engage in productive cooperation. We started to introduce a noise component many years ago based the international ICAO classification of aircraft types. Since 2001, we have been refining this system, and we introduced noise categories here at Frankfurt Airport on the basis of our test results. Because they reflect the actual noise behavior, they are fairer for our customers – the airlines. The emission component has now been added to the mix. We are therefore dealing with a continuous development and I am proud to have made a contribution.

Do you have any idea of how this trend will continue in the future?

The share and the significance of the

environmental component within the charging system looks likely to continue increasing. The Maximum Take-Off Weight has sharply declined in importance at FRA over the past 15 years. Perhaps it will be eliminated completely as a segment of the fixed charges in the not too distant future, and only the environmental component with an appropriate definition will remain. At any rate, this is the general trend. After all, environmental protection is already part of our business model today. The current discussion on climate protection demonstrates that this development has by no means been brought to a close. ■

1)

The regulations governing the environmental policy at Fraport have been set up to reduce charges for aircraft that have been defined as environmentally friendly, whereas the charges for aircraft classified as polluting have been increased. The total amount of the charges levied has not changed, only their weighting. The diagram shows the aircraft types BAe 146 (small aircraft) to B 742 (large aircraft) as examples, specifying the relevant composite fixed charge components. The airline saves more overall with smaller aircraft which are generally quieter and low emission (see fig. Δ Total). In the case of larger aircraft (see B 773, B 744, B 742), environmental charges (Δ emission, Δ noise) outweigh the reduced weight-related charge (Δ MTOM) so that costs per aircraft movement increase overall. This is particularly obvious in the case of the B 742 which is considered to be not exactly environmentally friendly. A high charge of around 450 euros is incurred here on account of the environmental component.

²⁾ Emission Related Landing Charges Investigation Group, ECAC (European Civil Aviation Conference)

FOUR-PILLAR STRATEGY TO UNCOUPLE GROWTH IN TRAFFIC AND ENVIRONMENTAL EFFECTS

Investments in sustainable



*Dr. Karlheinz Haag, Head of Group Environmental
Concepts at Deutsche Lufthansa AG*



... environmental protection



Dr. Haag, kerosene is the fuel used by the airline industry, and Lufthansa is not only one of the biggest airlines in the world but one of those generating the fastest growth. Prices for kerosene have been on a continually upward trajectory over the past years and months and there is rising concern that flying will no longer be affordable for ordinary citizens in future. Have we reached the limits of growth in air traffic?

That's not my perspective. Past experience has demonstrated that there have been many events and crises which have put a short-term brake on the development of air traffic. Just reflect for a moment on September 11, 2001. However, air traffic has always recovered from setbacks like this and it will continue to grow. The reasons for this are obvious. The economy of the 21st century demands global mobility and people want to travel quickly, comfortably, and safely. The high price of kerosene is a big challenge – Lufthansa now spends more money on kerosene than for its payroll costs. On the other hand, the high price of fuel also gives us a big incentive to save kerosene, which in turn benefits the environment. Each ton of kerosene that does not undergo combustion means 3.16 fewer tons of CO₂. This is of course the greenhouse gas that is primarily responsible for climate change.

Although you are saving kerosene, your fleet is expanding and the number of aircraft you have in the air is increasing. Doesn't that eliminate the saving effect?

Certainly not. Lufthansa has long been pursuing a strategy of separating environmental effects from traffic growth. We have enjoyed success with this approach in the past and we are continuing to work on an expanded strategic perspective that extends to the year 2020.

Are you able to put a precise figure on this?

Of course. Our projections are based on the long term and we are therefore in a position to prove that we have been successful in carrying out 50 percent of our growth in traffic volume since 1991 on an environmentally neutral basis. The separation of traffic growth and environment impact is therefore a fact. In 1999, we set ourselves the target of reducing specific fuel consumption with reference to the baseline year 1991 up to the year 2008 by 33 percent, and by 38 percent up to the year 2012. So far (May 2008), we have already achieved a reduction of 30 percent. The introduction of the new long-haul aircraft A380 in 2009 and the B 747-800 in 2010 will most likely enable us to achieve these very competitive targets. At any rate, I am confident of success. However, new aircraft powered by advanced

engines are only one element in the equation. We also have options for cutting down the consumption of kerosene and hence our CO₂ emissions elsewhere. One key factor will be the expansion of Frankfurt Airport, which is the most important hub in the Lufthansa network. In 2006 alone, capacity bottlenecks in Frankfurt resulted in our aircraft unnecessarily releasing more than 400,000 tons of CO₂ into the atmosphere as a consequence of being held in holding patterns and subjected to arrival delays.

You referred to the strategic goal of separating environmental impact from traffic growth and you talked about a period until 2020. What exactly do you have in mind?

I have already referred to two important initiatives: new aircraft that save kerosene and hence protect the environment, and airports that have sufficient capacity to ensure smooth operation. However, if we want to exploit all the potential to be derived from climate protection and aircraft noise, we need a comprehensive and sustainable vision

A brief question: Can you see an alternative to kerosene?

There may be an alternative to kerosene at some point in the distant future, but over the medium and long term kerosene is indispensable for the aviation industry. This fuel has a high energy density and offers a large number of other advantages. We're also dealing with a global infrastructure which you can't remodel from one day to the next. However, one possibility is adding synthetically derived kerosene, which would improve our CO₂ footprint.

Biofuel has been the subject of a great deal of criticism.

The argument goes like this: What's the point of generating fuel from biomass if rain forests are cut down to grow the fuel source?

There's certainly an issue there. Our function as environmental managers is therefore to take a very close look at this area. The real issue is the source of synthetic fuel and how it is obtained, and the impact of biofuel on the climate needs to be ascertained. You can produce fuel from coal



that we have to fulfill over the coming years and decades. The basic elements of this strategy have been formulated for some time. I'm talking about the four-pillar strategy that was originally developed by IATA (International Air Transport Association) and that determines the policy of virtually all the system partners in the aircraft industry: airline companies, airports and air-traffic control, as well as aircraft and engine manufacturers. This strategy is also relevant for governments to create appropriate framework conditions in areas like climate protection through national and international agreements and regulations.

Can you tell us about the four pillars and their potential for an impact on climate protection?

Briefly, the four pillars are comprised as follows – with my analysis here being based on the perspective of the airlines. Pillar 1 relates to technical progress. This primarily involves the aircraft, their engines, the aircraft weight, the aerodynamics, and technical features such as noise management in the new A380. The search for alternative fuels also comes into this category.

or gas but you can also create fuel from biomass. However, more CO₂ is produced from coal and gas than from the combustion of fuel which is derived from crude oil. This is not the case with biomass. As far as we are concerned, the conversion of biomass to liquid fuel therefore makes more sense in ecological terms. Another factor here is that in the long term, algae also represent a very promising raw material alongside biomass grown on land. However, this is all very much at the initial stages and requires an array of studies and preparations before any real progress can be made.

Let's return to the four-pillar strategy. What does Pillar 2 involve?

Pillar 2 entails an appropriate infrastructure that is in conformity with the needs of the system. Landside infrastructure essentially relates to airports, which have to provide the necessary capacity for smooth operation without any structural backlog. Airside infrastructure relates to initiatives such as the Single European Sky (SES), which allows routes from A to B to be shortened. The airways in Europe are a political anachronism that forces the airlines to fly on massive diversions. This is reflected negatively in kerosene

consumption and in the emissions footprint. Estimates confirm that a uniform European airspace would reduce CO₂ emissions by up to twelve percent.

And Pillar 3?

Pillar 3 stands for optimization of operational procedures. These are primarily the responsibility of the airline companies. Lufthansa, for example, has optimized its flight routes in Asia and this is possible there, unlike in Europe. We are also increasingly flying at adjusted speeds and using the jetstream to save kerosene. We have installed lighter seats in aircraft, optimized fresh-water provision, and improved calculation of the fuel requirement – all this saves weight and thereby cuts down the amount of fuel used. Optimization is even possible when it comes to aircraft maintenance. We can enhance the energy efficiency of the turbines by improving engine washing and save a total of 74,000 tons of CO₂ in just one year. Now we come to the last item. Pillar 4 relates to economic instruments...

And what is the perspective of the rest of the sector?

In principle, we are in agreement. Of course, there are a number of different positions in relation to the structure of emission trading. However, a difference of viewpoints is not confined to this issue. Nevertheless, I hope that we will have a robust solution in the not too distant future that can be applied worldwide and not just on a European scale in isolation. Climate change is a global phenomenon and CO₂ knows no boundaries. One-sided measures, such as an isolated system of EU emission trading, would not only disadvantage those parties concerned – it would not bring about any positive change with respect to the problem. We need a global solution. Anything else would be pure spin.

And just one final question: What is the most important contribution that Lufthansa has to make towards sustainable environmental protection?

I believe that the measures we have just been talking about have to be regarded as a holistic entity. We will only



...such as kerosene tax...

...which is not a solution from our point of view.

What is your objection to this tool? It would be an eco-tax, just like taxes that motorists have to pay when they fill up with fuel.

At first glance, maybe. However, if you take a closer look, the situation presents itself very differently. Air traffic is a global system which finances itself in principle by charges. Travel by road or rail isn't quite the same. Governments pay for the lion's share of the infrastructure like the road and rail network. We believe that a kerosene tax is not in line with the system and that it wouldn't have any effective ecological steering effect. Control can potentially be achieved with an appropriately structured emissions trading system, if it is set up in conformity with the market and the system. With respect to the air-traffic industry, conformity with the market entails "access to a maximally extensive market in certificates", and conformity with the system in our view entails a global solution.

be able to achieve the ecological targets we have set ourselves if we exploit all the options and intensively involve all the system partners in the aviation industry. We have just been discussing climate protection, but there are also other environmental issues that are extremely important, for example aircraft noise or the reduction of atmospheric pollutants like NO_x. As far as Lufthansa is concerned, our central focus is the aircraft and their technical equipment. We are continually renewing our fleet and issues like saving kerosene, climate protection and noise abatement are key criteria. Over the coming years, we will be investing 14 billion euros in new aircraft. You can rest assured that investment of this money will be in line with sustainable environmental protection.

Dr. Haag, many thanks for the interview. ■

PROJECT TO UPGRADE THE TECHNOLOGY CONTROL CENTERS IN TERMINAL 1

High-tech for the terminal: environmental protection starts with smart planning



1 |

Up to now, Terminal 1 has been the heart of Frankfurt Airport. Construction started up in 1965, in 1972 it was officially opened for operations by the German President at the time, Gustav Heinemann. Since then, the terminal has been used by around one billion passengers. The terminal has repeatedly been remodeled, fitted with new technology, tailored

to suit new uses, and extensively expanded with new buildings. It has meanwhile grown to encompass some 630,000 square meters of floor space. This covers approximately the area of 100 football pitches – but with a roof and air-conditioned.

The terminal has more than 50 centers housing the technology to keep the

air-conditioning system of this giant operating in line with the expectations of passengers, visitors and employees: the air-conditioning units, heating technology, cooling technology, and the control technology – today, we talk about building automation – which integrates the interaction of the various components. The plants and systems integrated within the tech-

Energy savings through updating and replacement

The 50 technology centers for air-conditioning in Terminal 1 are to be completely refurbished in line with comprehensive technical planning by the year 2018. The new technology means that the terminal will consume less energy and hence make an important contribution to the reduction of CO₂ emissions at Frankfurt Airport.



2 |

nology centers have to be replaced at regular intervals, either because the equipment has worn out with the passage of time, or because the deployment of newer, more cost-effective and more environmentally friendly technology is available. The process of replacement and renewal has to be planned over a long time-frame. Experts who know the termi-

nal inside out have to deal with what must appear to an outsider as a system of terrifying complexity.

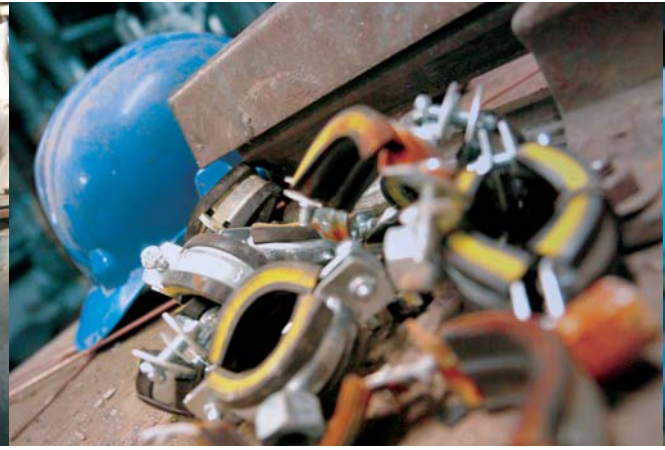
“Planning is like traveling by bus”

How do you make plans to re-equip 50 technology centers in one of Germany’s biggest building complexes

1 | In the “catacombs” of a massive building: one of 50 Technical Control Centers for Terminal 1. The air-conditioning is controlled and directed here. This system provides the interior temperatures that provide a comfortable environment for air passengers and employees.

2 | Everything planned down to the last detail: Sketch of a Technical Control Center.





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which is effectively operating round the clock seven days a week? When anybody asks questions like this, the Fraport planners tell the bus story: “We’re planning over a long time-frame extending to the year 2018. And naturally we can’t close the terminal for a single day because we happen to be installing new systems. You might say we’re in a similar situation to a bus which has to travel from A to B here and now. Our bus is no longer in the prime of life and the driver, who knows the bus like nobody else, will soon be starting his well-deserved retirement. Our job is to refurbish the bus with state-of-the-art technology while it’s traveling along, without interrupting the journey. The mission isn’t just to swap a couple of worn-out seats in the back but to change the entire engine which consumes much too much fuel and pumps out dark diesel clouds into the environment. And we also need

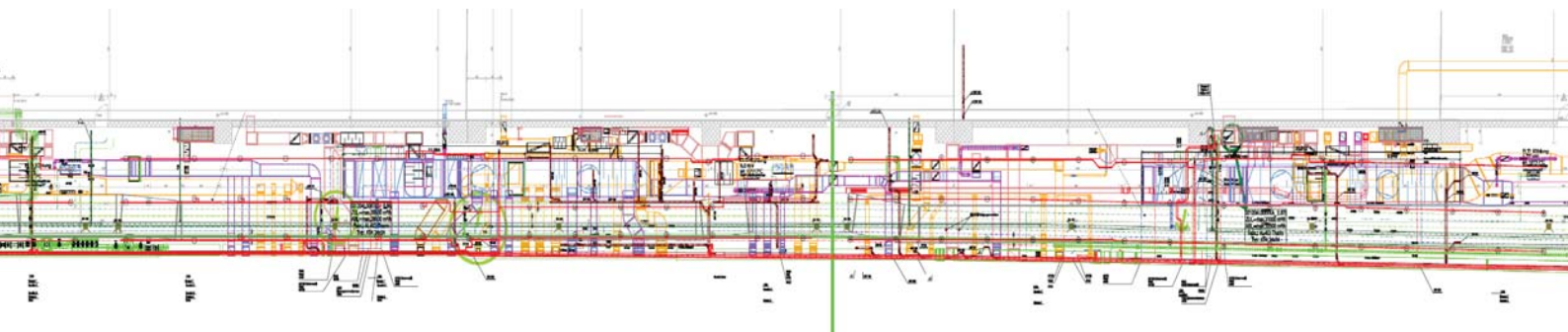
new tires – but please keep the bus rolling. That’s about the extent of the task we’re faced with. Only the whole situation in our case is just a little bit more extensive.”

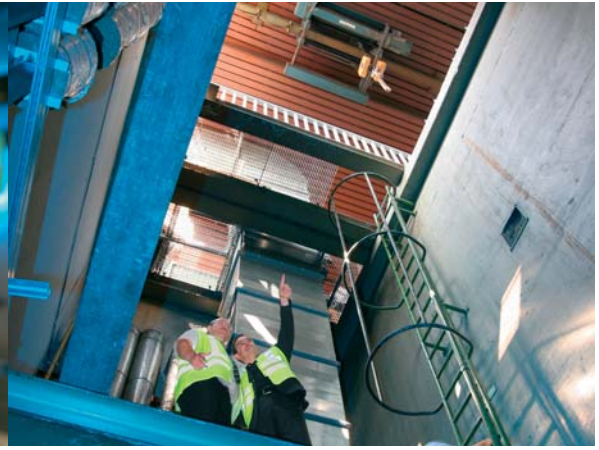
Saving costs in the system as a whole

The planning stage is vital, and like so many things, it also develops its own dynamic as the process gets underway. Originally, Fraport simply wanted to have a survey carried out in order to establish which of the individual items of equipment at the 50 technology centers will become obsolete at which point in time and when they should be replaced. But then a decision was taken to carry out a pilot project in the course of the “Upgrade the technology centers” project. This pilot project was intended to highlight the potential of different

measures for saving energy. The initial project stage involved reviewing the feasibility of the plans made for the entire Terminal 1 and implementation was summarized in a comprehensive general specification.

In view of the complexity of the entire project and the massive problems associated with the interfaces between the various technical trades and installations, an external company was commissioned to carry out overall planning control. The company oversees three general planners for three sections of the terminal. The Fraport planners effectively act as supervisors. The general specification forms the starting point and it prioritizes the commercial and technical goals. This stage is followed by the actual planning of implementation and ultimately by realization. By 2018, the re-equipping of the technical centers will have been completed.





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And what then? The planners are confident that “While there is still technical progress, planning and renewal will continue.”

Technical progress plus ecological benefit

Technical progress may relate to small and virtually imperceptible innovations in building automation which are directly associated with the current state of development of information technology and which may be extremely effective. But complex system changes can be worthwhile. For example, conventional air-ducting systems in air-conditioning are increasingly being replaced by water-pipe systems. Cost issues are the key initial factors for planning: “Naturally, a building in the dimensions of our Terminal 1 consumes a great deal of energy, and we’re assuming that ener-

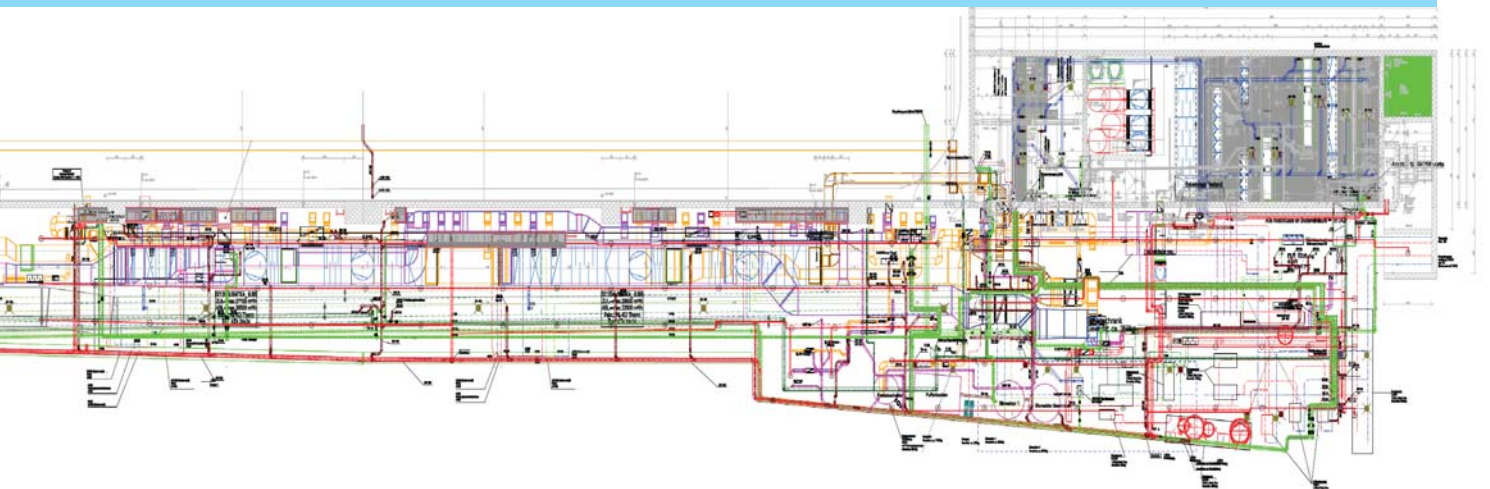
gy prices will continue to rise over the coming years. Every saving achieved at the planning stage delivers cash savings to our company after deduction of investments in new technology”, is how the planners explain their approach. “And this economic effect generally also has a direct ecological benefit. We need less energy, the energy efficiency of the building is significantly improved, and this means that fewer pollutants such as CO₂ are given off into the atmosphere.”

The program of rationalization measures has already seen an initial advance measure being implemented with air-conditioning center 4. This will save approximately 1,800 MWh each year. During the period from 2008 to 2011, the air-conditioning centers 18/30 will also be refurbished and this will save 6,600 MWh each year. The two air-conditioning centers offer an optimized solution for energy,

which will entail corresponding reductions in CO₂ emissions. The overall reduction in this case amounts to 2,400 tons of CO₂ each year. ■

1 | The Fraport planners: Jürgen Pfaff, Technical Program Manager and Werner Zeiss, Commercial Program Manager, on a building inspection.

2 | Logistic masterpiece: The new technology and all the equipment are brought to the underground Technical Control Center for installation through a small intake shaft.



FRAPORT AFFILIATE N*ICE IS LEADING PLAYER IN THE BUSINESS OF DEICING AIRCRAFT

Breaking the Ice

The specialists from N*ICE have 38 deicing vehicles to ensure safe and smooth-running flight operations at Frankfurt Airport each winter. They used their long track record of experience to develop a new system that allows the deicing agent glycol to be precisely measured. The new technology saves costs and reduces pollution of the environment.



Innovative technology protects resources

Hard winters are few and far between in Frankfurt, but every few years the weather gets really uncomfortable and 30 centimeters of snow can fall within the space of a few hours. 1996/1997 was a winter like that: cold, icy, and lots of snow. Frankfurt Airport was quite simply unable to keep up with the demand for deicing the aircraft on account of the extreme weather conditions. In preparation for the

following year, technical experts at Fraport AG, the Airline Operators Committee and Lufthansa worked out the Frankfurt Airport Deicing Plan. And on July 2, 1999, "N*ICE Aircraft Services & Support GmbH" was founded with Fraport holding a stake – an independent company within all the infrastructure necessary for deicing aircraft at Frankfurt Airport.

*Deicing vehicle from deicing company N*ICE engaged in deicing the wings of the A380.* →





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Deicing enhances flight safety

Wolfgang Gräf and Oliver Arzt from N*ICE are professionals when it comes to deicing aircraft, and they enjoy a distinguished reputation within the international aviation community. However, the “winter of the century” 2005/06 put even their professional knowledge and skills to a tough test. Instead of the average 5,800 aircraft deicings that are generally carried out at Frankfurt Airport, this time there were more than 9,000 deicing operations overall. “Our job has unrelenting quality standards and they have to be maintained under all circumstances”, as Wolfgang Gräf described the functions of N*ICE. “Effective aircraft deicing is a key aspect of aircraft safety. That’s because there’s quite simply no room for compromises.”

The problem is that ice, residual snow or even just hoar frost on the wing surfaces alter the contour of the wings and consequently change the aerodynamic characteristics. In a worst-case scenario, this can lead to disruption of the air flow which generates the lift in the aircraft. Despite reaching the take-off speed normally required, the aircraft fails to get off the ground – or it doesn’t continue to climb after lifting off.

Two stages are necessary to ensure that deicing operates correctly: deicing and subsequent anti-icing. A heated fluid applied under pressure is used for deicing. This deicing fluid is prepared in a system that is assembled on a truck. The fluid is primarily made up of water and the deicing chemical propylene glycol. After the deicing agent has been applied, the wings are covered in a protective film between one and two millimeters in thickness. This anti-icing fluid is also comprised of water and glycol. Polymers are added since their particularly long molecular chains make the mixture viscous. Once this film has been applied, the aircraft taxis to the take-off position free of snow and ice and commences the actual take-off procedure. At a speed of approximately 80 miles an hour, the air molecules flowing past break up the polymer chains, the protective film loses its viscosity, and the liquid flows off the wings. The aircraft then takes off safely and lifts off into the skies.

Ecological and economic aspects

Aircraft deicing on the ground is a science in itself. “The proportion of glycol we use always depends on the conditions”, is how Wolfgang Gräf explains the approach of the deicing team from N*ICE. “Three indicators are key factors here: the temperature,

the presence of precipitation, and the length of time the aircraft needs until it can take off. And then we build in a safety buffer, of course.” Part of the deicing fluid already runs off the wings during the cleaning procedure. This fluid is conducted into the apron drainage system to prevent it from entering the soil. Around 40 percent of the deicing agent remains on the aircraft and flows off when taxiing and on take-off. The jetstream swirls the deicing agent to form an aerosol and this gets into the air and from here into the ground.

“The polypropylene glycol that we use in Western Europe is not dangerous for the environment or health in the concentrations that we use at Frankfurt Airport. It is completely biologically degraded within a short space of time”, comments Oliver Arzt on the environmental properties of the deicing agent. “We are also subject to the strict environmental regulations laid down by the Regional Administrative Authority in Darmstadt and we are integrated within the environmental management of Fraport. The groundwater quality at and around the airport is also systematically monitored under this management. There are more than 500 measuring points. We are therefore in a position to effectively exclude negative environmental effects derived from our deicing agent.”



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Nevertheless, the deicing experts at N*ICE aim to reduce the quantity of glycol used as much as possible. This is also necessary for economic reasons: glycol has become increasingly expensive during recent years. And since N*ICE requires up to three million liters of this very useful fluid each year, any savings effects are extremely welcome.

New deicing technology "Made in FRA"

Aircraft deicing at airports directly affects air safety – and air safety is governed internationally by means of numerous regulations, standards and checking mechanisms. Is there any scope for optimizing the process? There's no question about it as far as the N*ICE experts are concerned, because they have developed a new technology and they successfully tested it during the hard winter of 2005/2006. Wolfhard Gräf: "We had an internal meeting outside the airport so that we could discuss a few fundamental issues without being subject to the permanent operational pressure. And when we were sitting together in the evening, we developed an idea of how you might be able to use less glycol. We discussed the idea with our system supplier Vestergaard who has specialized in deicing vehicles for airports. The sup-

plier then worked closely together with Uwe Schulz, the Technical Director at N*ICE, and initially installed the relevant technology in four vehicles. Conventional deicing vehicles have two tanks: one for a mixture of water and glycol for deicing and the other for pure deicing fluid for the anti-icing procedure. Our idea was to integrate a third tank and a second proportional mixing plant in the system. This would enable us to modify the mixing ratio for deicing and anti-icing much more precisely with the water carried in the separate tank to match the prevailing circumstances. We are now in a position to use precisely the amount of glycol necessary for safe deicing."

The tough practical test during the winter months worked so successfully that by 2009 all 38 deicing vehicles operated by N*ICE will have been converted to the new system. Other locations are also interested in the new solution: A series of airport operators, airlines and ground-handling services are considering the introduction of the new system. ■

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When temperatures drop, the specialists implement deicing of the wings.

THE FRAPORT ENVIRONMENTAL FUND PROMOTES NATURE CONSERVATION PROJECTS IN THE REGION

Where the natural wilderness returns



Promotion of nature conservation projects in the region

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The nature conservation center in Rodenbach is one of the numerous facilities in the Frankfurt/Rhine-Main region supported by the environmental fund of Fraport AG. The work carried out here is exemplary in many ways. Professional preliminary work has enabled committed conservationists to successfully launch a series of conservation and renaturing projects.

Nature conservation center in the municipality Rodenbach

Rodenbach in the Main-Kinzig district is located a few kilometers to the east of Hanau. The town is located in the middle of extensive forests which have been bisected by the Limes defensive line since the times of the Roman Empire. This line was recently declared a World Heritage Site by UNESCO. The nature conservation center is housed in a spick-and-span wooden building hidden away among trees at the edge of the town. The world here has remained undisturbed and the building seems to conform to all the clichés of a typical German club house. However, this initial impression of provincial homeliness disappears when you go into the building: offices rather than a bar. Computers instead of dusty filing cabinets. A beamer is installed on the ceiling of the conference room, and a unit for evaluating air samples is located in the corner. There's no doubt about it, this is a professional outfit.

Susanne Hufmann is a biology graduate who spent a number of years working in public service. She is now employed by the Society for Nature Conservation and Floodplain Development (Gesellschaft für Naturschutz und Auenentwicklung e. V.) which shares the nature conservation center with the Hesse Society for Ornithology and Nature Conservation and the Rodenbach Bird and Nature Conservation Society. The organizations cooperate with each other, and work between the three full-time staff and numerous voluntary members runs very smoothly. Their joint mission forms a bond between them. Susanne Hufmann rose to the challenge of moving from a safe post within the civil service to the uncertain world of nature conservation, which is dependent on sponsors and erratic public donations and she is quite evidently in good spirits: "The work that we're doing here is necessary and extremely useful. A conventional view would be that a lot of what we do here is the job of the government. However, I believe that we're doing the job just as well. And we also have the advantage of

really being able to make a difference through our personal commitment. There's more than one nature conservation project in the immediate vicinity and more generally in the surrounding environment that you come across in the course of your work and you think: If we weren't here this simply wouldn't be happening."

Sustainable nature conservation instead of fast PR sound bites

The activities of the nature conservation center focus on two areas. Nature conservation in the forest and water conservation. These two focuses require a systematic approach and a long lead time. Gaining Fraport AG as a sponsor is a big plus for the dedicated conservationists. This is because lots of sponsors are primarily interested in spectacular flagship projects which promise maximum public effect.



1 | Susanne Hufmann (right) and her colleague Günter Könitzer at work.





However, successful nature conservation is unable to work properly without scientific preliminary work being carried out – and this is time-consuming, expensive and often not easy to communicate to the general public. Since Fraport has its own Environmental Management and forestry specialists, the issue of nature conservation is seen from a professional point of view.

Fraport supports more than 500 environmental projects

“Since 1997, we have been sponsoring more than 500 projects from our Fraport Environmental Fund to the tune of more than 22.5 million euros. “Our company voluntarily donates sponsorship money”, comments Rainer Gomolluch from Corporate Communications. “And that’s why we are able to provide financial support for projects in the region that we believe are important and effective.

When we make a decision, we naturally ensure that these funds are deployed taking the issues of sustainability and retention of biodiversity into account.”

That’s why environmental managers at Fraport did not hesitate for long when they received a proposal from the Rodenbach Nature Conservation Center in 2001 to finance a project for drawing up comprehensive scientific documentation on the subject of “riverside floodplain woodlands in Hesse”. This work means that it is now possible to protect wetland forest habitats with particularly valuable ecologies in the immediate vicinity of numerous water courses. These habitats can also be further developed wherever possible. Securing these biotopes makes an important contribution to protecting species of plants and animals which are dependent on this specific habitat.

The success of this project has facilitated mapping of the entire region of Hesse on a similar scientific and financial basis. Patches of old forest formed the subject of this inventory. These are areas of beech wood which are no longer managed and have effectively been left to develop organically. The objective of this project was to draw up a survey of all the old forest patches present in the entire region of Hesse and analyze them to establish their condition, range of species, dead wood and hollow tree trunks. The task then was to draw up recommendations for an integrated system of old-forest and dead-wood habitats in forests located in Hesse.

Patches of old forest and alluvial forests along small rivers

“The preparatory work we were able to carry out thanks to the finance provided by Fraport forms a vital basis for

Fraport Environmental Fund: Ecological knowledge for the next generation

Knowledge about the environment and its complex processes is becoming more and more important with each new generation. Climate change is just one example of how environmental issues are increasingly determining our everyday lives. The status of environmental education has therefore increased significantly during recent years. The commitment and knowledge which is imparted to children and teenagers in dedicated lessons on ecology is a necessary and valuable investment in the future. Fraport’s Environmental Fund was set up in 1997. It promotes conservation and environmental projects and ecological research initiatives in and around Frankfurt, as well as educational environmental projects. The Environmental Fund has sponsored more than 130 landscape designs configured to emulate nature at schools and nurseries in recent years. Apart from projects in schools, financial support has also been provided for setting up information initiatives in nature conservation areas and establishing nature trails, such as the Geo Nature Trail at Oberjosbach and the Limes Experience Trail in the Hochtaunus nature reserve. Another educational environmental initiative has involved environmental tours for children and young people. They have been carried out on behalf of Fraport AG by qualified biologist Maria-Angela Simone. One focus has been aquatic environments.



implementing numerous practical nature conservation projects", is how HGON taskforce manager Herbert Steinhäuser describes the next step. "We now know the areas where we need to take action and what proposals we have to make. The science is in place and the problem now is to identify the right partners to make contact with." These might be private forestry owners, foresters, and frequently also mayors of local communities who own woodlands. The arguments a nature conservationist uses to persuade local politicians to designate a patch of old forest as a protected part of the landscape or to extend one of the few remaining alluvial forests along small rivers are not necessarily idealistic in nature. Any local authorities participating in this kind of project are credited with "eco-points". These are incorporated within the statutory specified offset payments which are incurred, for example, when a new bypass is constructed or a new indus-

trial park is developed. Another option is to sell the eco-points to "interventionists" who would otherwise also be subject to statutory compensation measures. One way or another, the bottom line is that the local authority saves money. "Some conservationists believe that this approach is not acceptable as a matter of principle. As far as we're concerned, this is a very effective lever to get things moving on the ground. You have to be realistic and see the perspective of both parties involved. There is a balance between strong nature conservation on the one hand and economic development of the region on the other hand. These endeavors are interdependent and we can't be blind to reality and carry out our work in a vacuum", is the explanation provided by Susanne Hufmann for the dilemma.

Amazonia on the River Kinzig

Nature conservation in Rodenbach has a track record of impressive success. The initiative of the society's members has created areas in the Kinzig environment which is more reminiscent of the rain forest in the Amazon Basin than of four-square German forests. And the landscape has also changed in the villages and towns of the district. The storks are returning after years of not being able to breed here. Although the idyll is not perfect – if it ever was – the natural environment in many places has clearly started to change for the better with the proactive support of the conservationists. ■

A water experiment box is also planned for schools in this context. It will allow water quality to be analyzed in biology lessons and plant and animal species from aquatic environments to be identified. Another initiative sponsored by Fraport relates to lectures and guided tours with Petra Simon. She goes to schools in the Rhine-Main area and talks about her many years of experience as head of a wild animal sanctuary. If the school agrees, she also brings exotic animals along to the lessons and talks about their lifestyle and behavioral characteristics. Both initiatives are to continue during the coming year. Details of schedule agreements, additional information on the Fraport Environmental Fund and applying for sponsorship money are available on the Internet by clicking on the website www.aktivfuertiregion.fraport.de



Biomonitoring at Frankfurt Airport: Environment study with honey bees

Honey bees are particularly sensitive in their reaction to environmental influences. That's why they are increasingly used as a "measuring instrument" for determining the quality of the environment in biotopes over a large area, which may cover an area of approximately 28 square kilometers. Frankfurt Airport has also invited these critical environmental inspectors to its site. In spring 2006, eight bee populations from the renowned Institute for Beekeeping at the Polytechnic Society Frankfurt introduced in the south of the airport. At the same time, another eight bee hives were set up at Niederursel and the northern Taunus region as control groups.

Since then, the bees have been under continuous scientific observation. Around 100 honeycomb cells, which contained eggs from the queen, were mapped for each bee population and their development was tracked until the bee pupas matured. The size of the bee brood was also calculated at the three locations. The honey is the third indicator. The quantity and the quality were investigated with the assistance of two other independent research institutes.



Driving the future: Hydrogen cars on trial

Katja Huth, you work for Fraport and have been using cars powered by fuel cells as part of a field study at Frankfurt Airport for the past year and a half.

What's it like to drive with hydrogen? > Katja Huth: Just like a conventional car. There's virtually no difference in the performance and handling. Normally, I'm no longer aware that I'm driving a special car.

Are there any differences at all? > You don't notice the most important difference when you're driving: the vehicle doesn't generate any emissions. No CO₂, no NO_x, no particulate substances. Just water comes out of the exhaust and that's why our test car doesn't have a special emissions test badge. Otherwise, the car is very quiet and you have to refuel frequently.

Waste management at Frankfurt Airport: Avoidance, recycling, disposal

Frankfurt is the first German airport to produce a comprehensive publication about waste management. It is entitled "From waste to raw material" (Vom Abfall zum Rohstoff) and covers the entire waste management process at Germany's biggest airport. The brochure has been printed in a climate-neutral procedure on FSC paper to conserve resources. It presents all the important information on the subject including the relevant figures, data and facts. A separate supplement accompanying the brochure is published every year with the latest "Waste data" of Fraport AG.

The basis for waste management at the airport is the German Substance Cycle and Waste Management Act (Kreislaufwirtschafts- und Abfallgesetz) and the regulations of the EU Waste Framework Directive, which have been introduced in Germany with binding effect. Separate collection of different waste categories and proper disposal are a key goal at Fraport. Where waste cannot be avoided, waste materials should be completely recycled as far as possible. Waste is only consigned to final environmentally compatible disposal as the last option.



Detailed data on the biomonitoring is now available and the scientists carrying out the analysis were initially surprised by the results obtained. As far as brood development was concerned, there are no significant differences between the three sites. The bee populations at the airport were particularly successful at producing honey, and with an average yield of 19.9 kilograms per population and year they were well above the average productivity of German bee populations, which produce between 13 and 15 kilograms a year. The qualitative analysis of the airport honey also generated excellent results. It meets the strict quality requirements of the German Beekeepers' Association with an exceptionally rich pollen spectrum and a high level of enzyme activity. All these results point to good biodiversity at Frankfurt Airport.

How often? > Every 120 to 160 kilometers depending on the driving style.

Where do you refuel with hydrogen? > We refuel at Infraserv in Höchst near the airport. There's a special fuel station there where you can refuel with hydrogen. Filling up with hydrogen is rather different from normal. You use a kind of compressed air valve, but it's quite simple.

How safe are these cars? And how dependable are they? > The technology has been matured and is sufficiently robust. We use the three cars that we're currently testing on roads, motorways and on the airport apron. They don't have to be serviced more frequently than standard models.

What's your view? Does fuel-cell technology have a future in the car? > I can't answer this question simply with a straight Yes or No. It depends on a large number of factors including the future price of oil, the costs of a hydrogen infrastructure, the possibility of maximally clean production of large volumes of hydrogen, the statutory regulations for climate protection – to name just a few issues. But I would say that in principle, hydrogen is a realistic option for developing low-emission transport systems over the long term.

Fraport AG has a mission to achieve sustainable waste management throughout the airport complex with all the available resources.

The brochure "From waste to raw material" is only available German in the series "Environment Spectrum" of Fraport AG on the Internet under <http://www.fraport.de>. It can also be ordered by post from Fraport AG, UKM-IK, 60547 Frankfurt am Main, Germany.



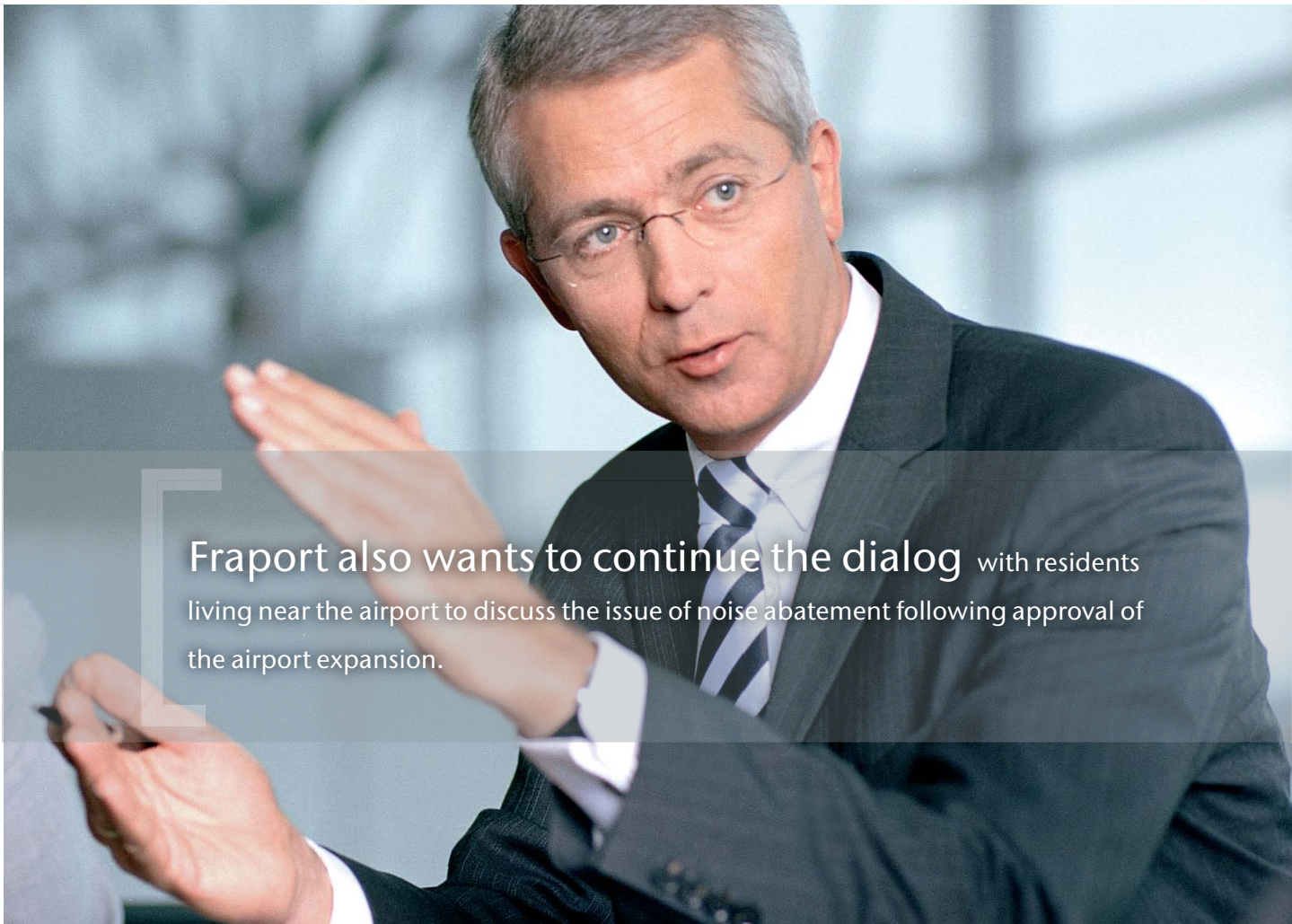




INTERVIEW WITH DR. STEFAN SCHULTE,

Vice Chairman of the Executive Board of Fraport AG and Executive Director Traffic and Terminal Management, Airport Expansion

“We will play a major role in the deployment of noise-abatement measures!”



Fraport also wants to continue the dialog with residents living near the airport to discuss the issue of noise abatement following approval of the airport expansion.

Dr. Schulte, the approval of the Zoning Plan on the expansion of the airport was signed in December 2007. This enabled Fraport to start constructing the new runway. It is now May 2008 and the runway still isn't being built, although the Executive Board has been pressing for expansion of the capacity at the airport for years. Why have you suddenly become so hesitant?

The airport expansion has been on our agenda for a decade. The basis for the expansion was formed by mediation and a Zoning Plan procedure governed by air-traffic legislation. This involved a great deal of planning resources for Fraport. When the Zoning Plan was adopted on December 18, 2007, we effectively received the building license for the expansion. Why haven't we started building operations yet? Lawsuits

have been filed in court against the approval of the Zoning Plan. These actions were predicted and we have always maintained that we would not take any irreversible actions, in particular cutting down woodlands, without consultation with the Hesse Administrative Court out of respect for the independent court system. This approach is also in line with the fair dialog we want to have with the residents affected by the expansion.

You are assuming that the judgment will be in your favor and you will then start work on the expansion?

Rendering a judgment is the prerogative of the courts and we will have to accept their decisions – just like everyone else. However, we believe that the Zoning Plan approval has such a good foundation that it will not be rescinded. As far as starting work on construction, we are generally bound by nature conservation regulations. It looks as though we will only be able to cut down woodland from September to February.

The regulations governing the approval for the Zoning Plan as far as nature conservation and protection of the environment is concerned are very extensive and detailed.

That is definitively the case. Although Frankfurt Airport is in the middle of a conurbation, the settlement situation in the vicinity of the airport is relatively favorable compared with the urban landscape at other airports. Nevertheless, there are communities in the neighborhood that will be significantly affected by aircraft noise, and the strict regulations on noise abatement are therefore justified from that point of view. Undoubtedly, there could be quibbles over individual issues, but Fraport supports a process in which strict regulations enhance legal certainty. For example, we therefore welcomed the new legislation on aircraft noise that came into effect in 2007. The noise values that are prescribed here go much further than the regulations under the previous legislation. The new regulations mean that we have to put more resources into noise abatement and there is correspondingly enhanced legal certainty. They serve the needs of both sides: the citizens living in the vicinity and the airport.

“... When the Zoning Plan was adopted on December 18, 2007, we effectively received the building license for the expansion.”

“...The result is that the airport strengthens the economic power of the region, guarantees excellent mobility for people and companies, and with the current level of 70,000 jobs represents the biggest workplace in Germany.”

Airport expansion entails more air traffic which will inevitably produce more aircraft noise in the surrounding districts.

What arguments do you have for those who will be increasingly affected by the rising impact of aircraft noise?

The airport location provides a key benefit for the Frankfurt/Rhine-Main region. The excellent “connectivity” with Europe and the rest of the world offered by the airport means that companies locate in this region, create jobs, and increase purchasing power. The result is that the airport strengthens the economic power of the region, guarantees excellent mobility for people and companies, and with the current level of 70,000 jobs represents the biggest workplace in Germany. The expansion is necessary in order to secure this locational advantage and enable us to match the increasingly tough competition from other airports and business locations in the age of globalization.

But that means more noise!

Firstly, it means more passengers, more freight, more aircraft movements and therefore more aircraft noise as well. This will impact on some parts of the region. Our mission is therefore to use all the effective, feasible and commercially efficient technical and operational measures to minimize this aircraft noise for those people affected. This primarily involves the airlines, air-traffic control and the regulatory authorities, but also Fraport, and ultimately the aircraft and engine manufacturers. One of our declared goals is to significantly reduce the number of people in the Frankfurt/Rhine-Main region impacted negatively by aircraft noise compared with the value forecast for 2020. In practical terms, this means that technical measures need to be identified and implemented which will reduce the noise emissions generated by the aircraft. Less aircraft noise can also be experienced by residents in the district if flight management and flight procedures are optimized and take the settlement structures around the airport into account. Naturally, safety and capacity issues also play a role here alongside technical and operational factors. I can only say that the aviation side is carrying out an intensive review of noise abatement measures. →



“...the number of aircraft movements during the mediation night is limited to one third of the current volume of air traffic.”

Keyword aircraft noise: The prohibition on night flying, as requested in mediation, has been generating considerable controversy in the surrounding area for a considerable period of time and some very strong emotions are aroused on this issue. The night flying regulations defined in the approval for the Zoning Plan permit exceptions between 23.00 and 5.00 and this has been broadly criticized in public debate. What is the position of Fraport on this issue?

Originally, Fraport AG advocated a so-called mediation night in its application for the Zoning Plan. In other words, a prohibition on night flying for flights scheduled between 23.00 and 5.00. The regulatory authority responsible for approval – the Hessian Ministry of Economics, Transport and Regional Development – did not agree. Why? The reasons are legal. The ministry has an obligation to approve zoning plans taking account of all the legitimate interests and objections on the basis of decisions rendered by the courts. The result is an objective and multilayered noise abatement concept that takes reasonable account of the function of the airport as an international hub, the interests of the airlines based here, and the protection of residents in the district against aircraft noise.

Just a moment: Where is the protection for the residents?

This is essentially provided by the fact that the nighttime scheduled aircraft movements or slots are defined from 22.00 to 6.00 and this means that a binding upper limit has been defined. Only 150 aircraft movements may be scheduled each night on an annual average. We never applied for this kind of limit. A maximum of 17 scheduled slots are planned for the period between 23.00 and 5.00, and only low-noise aircraft with chapter 4 noise classification may be used. This is the concession to the location-specific requirements I have just referred to. If the 17 possible slots between 23.00 and 5.00 are full, 133 plannable slots are available in the marginal nighttime hours, i.e. the period between 22.00 and 23.00 and between 5.00 and 6.00. Allowing a strictly limited number of aircraft movements

in the period between 23.00 and 5.00 does not therefore increase the total number of nighttime aircraft movements. They were not approved as additional slots. New impacts will also not be generated through the new runway because this will be closed from 23.00 to 5.00. A small number of essential aircraft movements will therefore be shifted from the night shoulder hours to the mediation night. However, the number of aircraft movements during the mediation night is limited to one third of the current volume of air traffic. This is how the approval of the Zoning Plan meets the demand arising from mediation for a ban on night flights between 23.00 and 5.00.

The approval of the Zoning Plan imposes a series of other regulations for noise abatement on the airport. What is your perspective and what effect will they have in your view?

Some of these regulations relate to taxiing and operations on the ground. For example, pilots are only permitted to use thrust reversal in the engines for braking the aircraft if this is necessary for safety reasons. Moreover, parking positions need to be supplied with ground power supply and this minimizes the use of auxiliary engines or mobile ground power supply for the equipment on board the aircraft and the associated noise emissions. Apart from take-off and landing, and the taxiing directly associated with these maneuvers, aircraft trucks must be used for taxiing procedures. And the loud full-power ground run-ups for the engines may only be carried out at night in a specially designed installation which is effectively a massive sound screen. The combination of all these measures will ensure that the noise generated directly at the airport is tangibly reduced. At the same time, we are working together with the airlines and the Federal Bureau for Air-traffic control (DFS) to further improve active noise abatement.

What do you understand by active noise abatement?

All realizable technical, and operating measures that are able to reduce aircraft noise, or more precisely, its effects on the residents around the airport. These include increasing the leading-edge angle used in the approach. The low-noise Continuous Descend Approach (CDA) is already used during the nighttime from 23.00 to 5.00 when traffic volumes are low and plans are currently under consideration to extend this procedure to a wider timeframe.

Isn't this a matter for air-traffic control?

When it comes to aircraft noise measurement, everyone is in the same boat: the airport, the airlines, air-traffic control. And when you have successfully tested something new, it still has to be approved. This is one of the reasons why there is a joint declaration by the air transport industry and the state of Hesse on Frankfurt Airport.

What is in this declaration?

The declaration essentially addresses three issues: 1. Continuation of the dialog with the neighboring communities beyond the approval of the Zoning Plan. 2. Creation of a joint basis for implementing noise abatement measures for the benefit of the region. 3. Clear commitment by the air transport industry to a "house of environment". Our joint message to the region is therefore: noise abatement has a high priority.

Climate protection is currently the big talking point on the environment. Isn't there a danger that as a consequence, the issue of aircraft noise will be marginalized or even swept under the carpet?

That's not where I'm coming from. Our Environmental Management cooperates with the technical departments at Fraport and is able to take a professional approach to all the important environmental aspects associated with a major airport. The increasing importance attached to the issue of climate protection is another aspect that needs to be considered when implementing the defined noise abatement targets. As well as looking at the potential for

reduced noise in a newly developed flight procedure, state-of-the-art research looks into the influence of the procedure on fuel consumption. Incidentally, the Executive Management are not alone in monitoring the implementation of environmental targets, external environmental inspectors also play a monitoring role. We also need to meet the new requirements defined in the approval of the Zoning Plan relating to aircraft noise, and the media continue to respond extremely sensitively – especially in the vicinity of the airport – to the issue of aircraft noise near the airport complex.

Dr. Schulte, you have made a big case for a "house of environment" in order to improve dialog between the airport and the region. What is behind this proposal and how can the "house of environment" act as a platform for communication and an exchange of ideas between the airport and the region?

I have already said that Fraport AG, as the airport operator, has a vital interest in having a good relationship with our neighbors near the airport. We have no intention of breaking off the dialog that was launched with the mediation and continued through the Regional Dialog Forum. We need a platform for dialog and we want to get closer to the citizens, particularly with respect to noise. This is where the "house of environment" comes in. Our ultimate aim is to create an information and dialog platform that is easily accessible to citizens where we can have a constructive debate about the positive effects and the negative implications of air traffic, but where we can also provide information about progress and new trends in the air transport industry. Ultimately, we want to create a "house" in which noise is "tangible", for example also by comparison with the traffic systems road and rail.

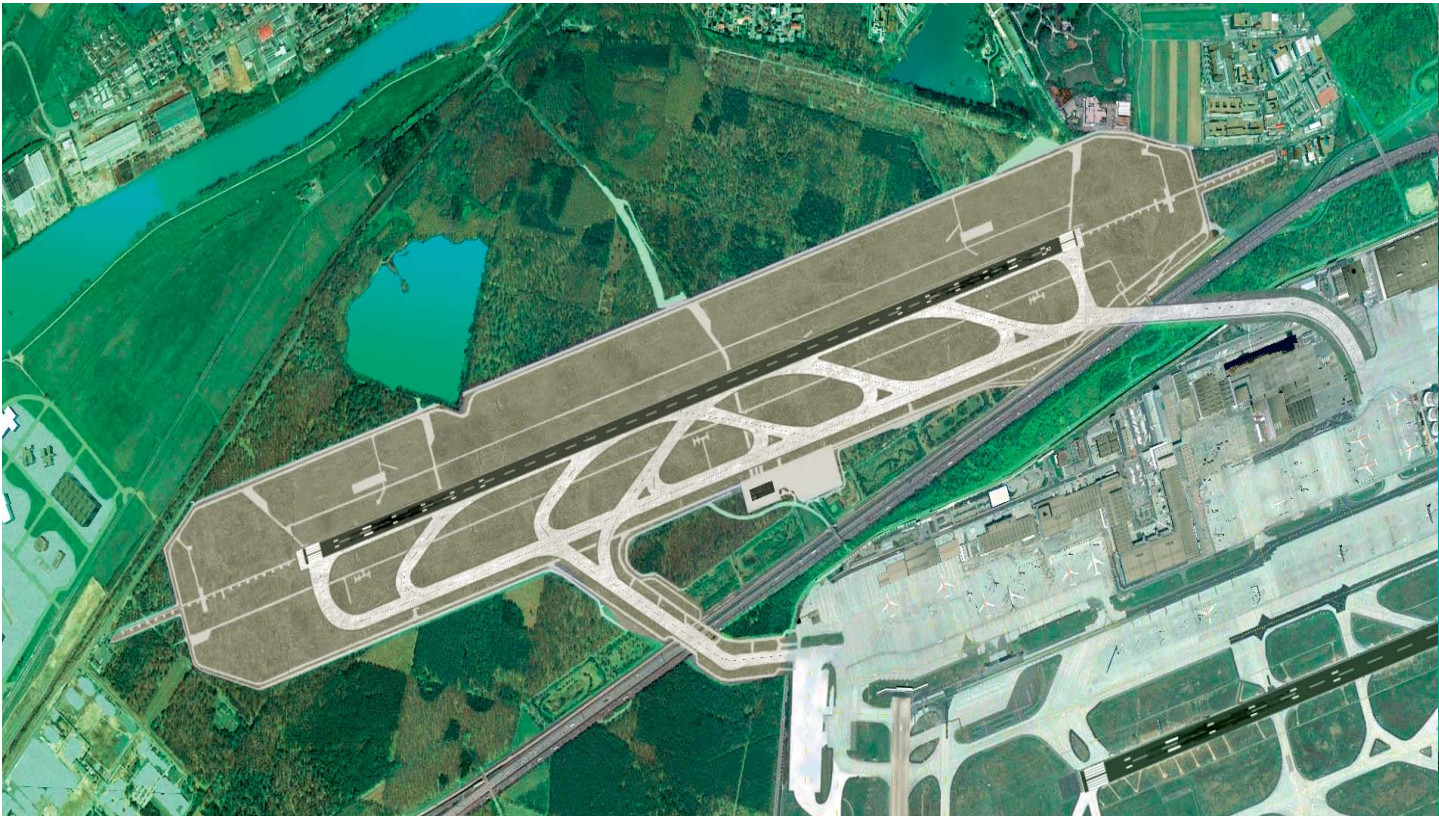
Dr. Schulte, thank you for the interview. ■

"...Our joint message to the region is: noise abatement has a high priority."



AIRPORT EXPANSION APPROVED BY THE PLANNING AUTHORITY

Expansion based on ecological concepts



December 18, 2007: This was the day Fraport had been anticipating for a very long time. The incumbent Hesse Economics Minister Alois Rhiel came to the press at the Hesse parliament building to explain his decision on the application for a Zoning Plan submitted by Fraport AG for the purpose of expanding the airport. He finished by signing the Zoning Plan resolution necessary for providing legally binding approval of the building application. More than ten years have elapsed between the start of discussion about the expansion of Frankfurt Airport and the point of approval.

Expansion of capacity is controversial

The process started in autumn 1997 when the CEO of Lufthansa at that time, Dr. Jürgen Weber, demanded the expansion of Frankfurt Airport. He stated that Frankfurt was the home base and most important hub of Lufthansa which networked intercontinental air routes with European and German air travel. He argued that capacities at the airport would soon

be exhausted and expansion was absolutely essential since air traffic was continuing to grow. Fraport AG concurred with this position and defined the objective of increasing the potential number of aircraft movements by around 50 percent by means of capacity expansion. However, Chairman of the Executive Board Dr. Wilhelm Bender made it absolutely clear from the start that expansion could only proceed in a consensus with the majority of the population in the Rhine-Main

region. The massive protests about the construction of Runway 18 West at the beginning of the 1980s were still vivid memories and the airport wanted to do everything in its power to avoid this kind of confrontation. This is why Fraport immediately agreed when the Hesse State Government initiated a mediation process with the focus on the environmental consequences of the airport expansion. →



Environmental perspectives were defining characteristics in the selection of the location for the new **north-west runway.**

Mediation agreed to expansion subject to certain conditions

The mediation panel met for the first meeting in the summer of 1998. The parties involved in the process included representatives from many different interest groups including residents living around the airport, the airport itself, other air transport companies, and representatives from politics and business. The panel was chaired by the Lutheran environmental priest Professor Kurt Öser, the Chairman of Frankfurt Chamber of Industry and Commerce Dr. Frank Niethammer, and European MEP Professor Hänsch. The objective of the mediation was to achieve “a scientifically based, socially viable balance between the diverse interests involved,” against the background of the planned expansion of the airport. Experts on noise pollution, air pollution and the degradation of the natural environment were commissioned to examine the environmental consequences of expansion. A key aspect was the possible position of the new runway. Fraport had commissioned the Federal Aviation Administration (FAA) to carry out a preliminary study on the new runway and this came up with 21 possible variations for discussion. The mediation process looked in depth at the final short list of seven different sites for a

new runway and analyzed their effects on noise pollution and forests, the natural environment, the atmosphere, and the groundwater. The final report drawn up by the mediation group was presented in January 2000. It advocated construction of a new runway but also proposed a ban on night flying, an anti-noise pact, and the establishment of a regional Dialog Forum specifically for the issue of airport expansion. The panel did not want its remit to extend to defining a site for the new runway definitively at that stage, but the mediators recommended three variants for further investigation:

- the north-west landing runway in the Kelsterbach Forest
- the north-east landing runway in the Schwanheim Forest
- the take-off and landing runway in the south with the demolition of the western runway.

Regional land use planning process favors north-west option

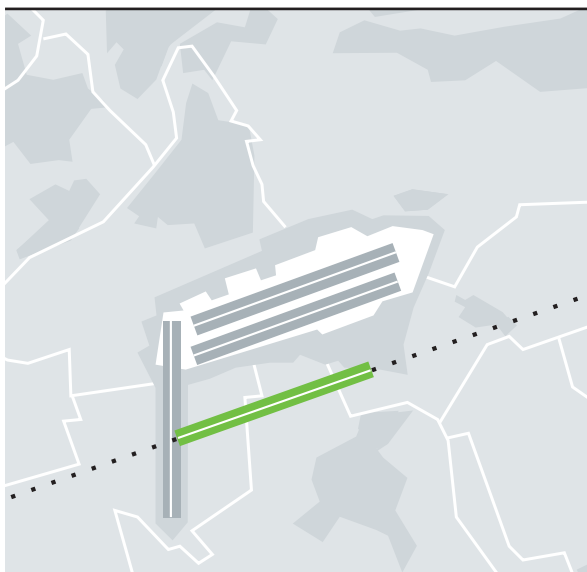
The official approval procedure commenced in the summer of 2000. The first phase dealt with the regional land use planning process. During this process, an array of options for expanding capacity, including the three mediation proposals was reviewed and compared by the responsible

authority – the Darmstadt Administrative District Board – with the participation of the general public.

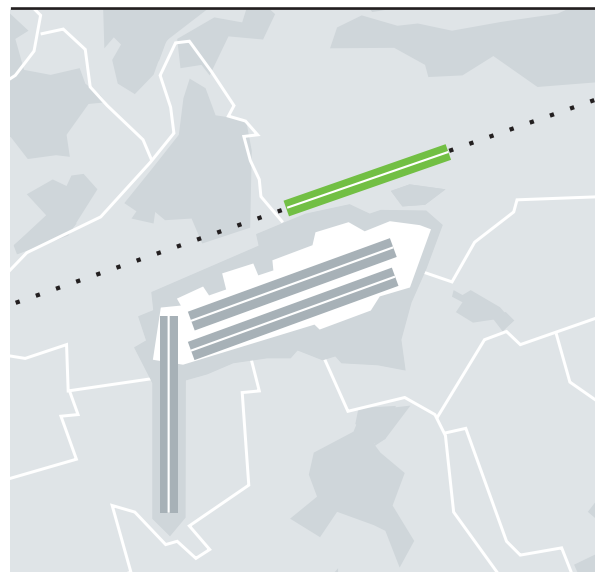
The documents prepared by Fraport formed the most important basis for this process. These documents were contained in a total of 16 files. The regional land use planning process carried out individual reviews on the “harmonization of the requirements” of residential settlement, business, transport, the water industry, energy supply, woodlands (forestry industry), and other associated issues. An “environmental impact assessment on the effect of the airport expansion on environmental issues (regional land use environmental impact assessment)” was carried out. This was based on the following protected assets:

- People (primarily the effects of aircraft noise)
- Animal, plants, biotopes
- Soil, water, air, climate
- Landscape
- Culture and other assets.

The regional land use planning process was completed in June 2002. The assessment of the runway alternatives was summarized in a table on the basis of individual issues relevant to the environment: The result was self-evident: “If all the criteria relating to protected assets and overarching these assets are taken into account, the



Version South



Version North-east

Comparison of the individual rankings of protected assets and derivation of overall ranking ¹⁾			
Protected asset/Sub-aspect	Version North-west	Version North-east	Version South
People – living and living environment function	1	2	2
People – recreational and leisure function	1	3	2
Animals and plants – Animals	3	1	1
Animals and plants – Plants and biotopes	1	3	2
Soil	1	2	3
Water – groundwater and used groundwater	1	2	3
Water – Surface water	1	1	3
Air	1	2	2
Climate	1	2	3
Landscape	1	3	2
Cultural and other assets	1	3	2
Interactions ²⁾	1	2	3
Overall ranking	1	2	3

¹⁾ assuming that the protected assets are all equally weighted ²⁾ in particular effects on forests, protected forest and regional green spaces

following result is derived for comparing the alternatives. The north-west alternative is clearly the alternative of choice.”

Zoning Plan procedure for the north-west runway

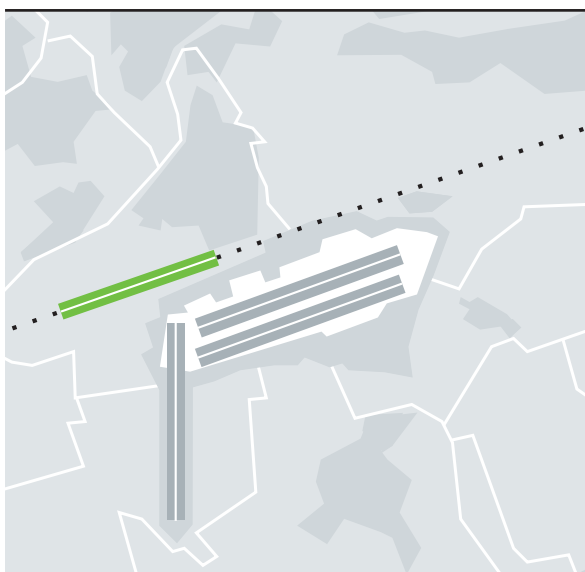
The Zoning Plan procedure is a public approval procedure which examines a number of different aspects and in that context carries out an in-depth analysis of the environmental impact following the initial assessment defined in the regional land use planning process. The Air Traffic Act (Luftverkehrsgesetz, LuftVG) forms the legal basis for a Zon-

ing Plan procedure in the case of airports. The licensing authority in this case was the Hessian Ministry of Economics, Transport and Regional Development. The participants in the Zoning Plan procedure included the following:

- The authority responsible for the public hearings (Darmstadt Administrative District Board)
- The Zoning Plan authority (Hessian Ministry of Economics, Transport and Regional Development)
- The developer (Fraport AG)
- Other parties involved: local communities and regional administrative authorities, public interest groups (for example planning authorities,

associations for the protection of the environment), private individuals affected by the development.

The expansion measures were justified in the Zoning Plan documents drawn up by Fraport. Furthermore, they included a restriction of the operating license for scheduled flights between 23.00 and 5.00 after the new runway comes into operation. The total scope of the application amounted to some 17,500 written pages, 900 plans and maps, 39 expert reports and analyses, as well all the engineering plans set out in the documents required for capacity expansion. →



Version North-west

*“If all the criteria relating to protected assets and overarching these assets are taken into account, the following result is derived for comparing the alternatives. The **north-west** alternative is clearly the alternative of choice.”*

Zoning Plan approval allows airport expansion

After a large number of internal meetings, scoping sessions with associations and institutions, and public hearings with the individuals and organizations affected, the Zoning Plan procedure was concluded with the approval of the Zoning Plan in December 2007. The document has more than 2,500 pages and provides detailed specifications for the expansion, concluding in the overall summing up that “in the opinion of the Zoning Plan Authority, the north-west runway is the project alternative of choice”. Key criteria determining this assessment were transport issues and protection against noise pollution: “The other expansion options were examined in detail by the Zoning Plan Authority and assessed on a comparative basis. The results indicate that they are either already not appropriate for meeting the capacity requirements (...) or have disadvantages by comparison with the north-west alternative when assessing the overall effects of the project, particularly analyzing the effects of noise pollution in each case.” Another aspect was the loss of woodland: “Approximately 294 hectares of woodland will be cut down and (...) to a large extent

that land will be permanently converted to a different use (282 hectares). However, twelve hectares of woodland will be reforested and 288 hectares of new woodland will be planted to offset the loss of woodland and protected forest.” Overall, all the statutory protective regulations were taken into account by the approved Zoning Plan: woodland areas with a high level of biological diversity are replacing areas of woodland cut down in the vicinity of the new north-west runway, animal species at risk re being relocated, new nesting and brooding sites are being created, and general impacts on the environment, for example through air pollution or contamination of the groundwater, will be minimized as far as possible.

Zoning Plan aims for legal security

The exceptions to the ban on night flying based on legal rulings were a bitter pill to swallow for the people living close to the airport: The objective of the Zoning Plan procedure was to create a secure legal basis and this was not guaranteed on the basis of an absolute ban on night flying. Germany is a constitutional state and a Zoning Plan resolution can therefore be con-

tested in court even if the resolution is based on extensive justifications. The ban on night flying requested by the mediation process, applied for by Fraport, and regulated in the Zoning Plan procedure by an exception clause will remain the focus of legal disputes for some time. Nevertheless, the key hurdle for expanding Frankfurt Airport was overcome by the adoption of the Zoning Plan.

The overview of environmental activities provided below presents the key measures relating to the issues of noise and atmospheric pollutants, biodiversity/nature and species protection. A complete overview of the extensive activities can be found in the adopted Zoning Plan dated December 18, 2007 by clicking on www.wirtschaft.hessen.de.

1 | When the Zoning Plan procedure was completed, the Hesse Economics Minister Dr. Alois Rhiel (right) gave the go-ahead for the Airport expansion. Prof. Dr. Wilhelm Bender (left) takes receipt of the comprehensive document with a total of 2,500 pages.



Measures for reducing emissions

Noise exclusively:

- Quota for scheduled aircraft movements during the night.
- Noise protection installation for ground run-ups.
- Restriction on the acoustic power emitted from high-rise buildings and freight-forwarding areas.
- Intensification of monitoring of aircraft noise with additional measuring devices and calculating models on a regular basis.
- Operating restrictions on aircraft that are not in conformity with state-of-the art engineering.

Noise and atmospheric pollutants:

- Replacement of diesel-powered ground power units by electrical power caddies (apart from backup maintenance).
- Avoidance of aircraft taxiing emissions by towing to hangars, in changes of position, and for journeys to ground run-up positions.
- Restriction on reverse thrust to the lowest "idling" load level (apart from emergencies).

Measures to protect nature and species:

- Avoidance, reduction and protection measures (for example, relocation of protected animals and insects, such as sand lizards, ants, and stag beetles).
- Installing protective fences and protective curtains for water birds, bats, amphibians and mammals on the site of the new runway and the surrounding roads.
- Restricting deforestation activities to the winter months.
- Compensation and coherence measures in the Rhine-Main area for which Fraport is investing a total of over 100 million euros. These areas cover a total area of approximately 2,300 hectares: reforestation on an area measuring 288 hectares, improvement measures in the surrounding woodlands on some 1,400 hectares, a range of special projects for renaturation and improving woodlands, meadows and conservation areas (for example floodplains in the Nidda valley).
- Ecological monitoring of all planned construction measures, which will be subject to strict compliance with conservation regulations.
- Intensive checks on the measures implemented and long-term environmental monitoring of the airport environment.

Airport expansion in figures

	2007	2020
Number of passengers in million	54.2	88.6
Aircraft movements	492,569	701,000
Number of employees at Frankfurt Airport	approx. 70,000	approx. 110,000
Length of new north-west runway		2,800 meters
Area of forest cut down for the airport expansion		282 hectares
Area of measures for compensation and maintenance of coherence ¹⁾		
carried out by Fraport		more than 2,300 hectares

¹⁾ Measures for maintenance of coherence ensure that the European "Natura 2000" conservation network remains coherent, i.e. intact, despite construction measures.

ECOLOGICAL CRITERIA ARE DEFINING CHARACTERISTICS IN THE CONSTRUCTION OF THE NORTH-WEST RUNWAY

Construction that respects people and nature

The approval of the Zoning Plan for airport expansion in Frankfurt regulates the ecological context for capacity expansion, for example the modalities of operating night flights and compensation measures such as reforestation, as well as defining specifications and requirements for the actual construction work. These include the following provisions and measures:



- Construction vehicles and machinery must be in conformity with the European emissions standard.
- Trucks traveling through built-up areas must be avoided.
- Transport on existing woodland or forest tracks should be avoided if possible in order to protect adjacent woodland areas.
- Unmetaled construction roads and the construction site should be sprayed with water as necessary in order to prevent nuisance and pollution being created by clouds of dust.
- Fences should be erected around the building sites for security.
- The facilities on building sites must be organized so as to provide maximum protection for the land. Particular efforts should be made to conserve natural assets protected under Natura 2000.
- Tree populations that are adjacent to the construction sites and that are to be preserved must be protected in accordance with DIN 18920.
- Trees in the area surrounding the construction site must be protected by appropriate precautions, e.g. cushioned plank surrounds. Any undergrowth or trees that nevertheless sustain damage must be professionally reinstated after construction operations have been completed.
- When carrying out construction work, it is important to ensure that no hazardous substances which risk contaminating the groundwater (e.g. by failing to refuel construction machinery in accordance with standard operating procedures or by using unsuitable construction materials) are allowed to enter the subsoil.
- Building trenches must be excavated so as to avoid contaminating the groundwater.
- All construction measures are subject to hydrogeological monitoring.
- Implementation of avoidance and minimization measures and compliance with such measures must be ensured by the construction managers and building inspectors.





INNOVATIVE TECHNOLOGY SAVES ENERGY IN THE NEW TERMINAL 3

*Efficiency rather than
ostentatiousness*

Apart from the north-west landing runway, the new Terminal 3 is the most important construction project for purposes of capacity expansion at Frankfurt Airport. The engineers working on system planning for the project are aiming to enhance the energy efficiency of the building by using innovative technologies in order to achieve maximum comfort and security for minimum CO₂ emissions and minimum operating costs.

Individual Airport Terminals

In an age of globalization, a major airport terminal is not quite like other buildings. Terminals are gateways to the world, and entry ports to a country or region. Some architects regard them as the temples of the 21st century. How should an airport terminal be designed today? There are lots of different answers to this question and they differ according to the region, political scenario and cultural environment. Airport terminals in the USA are generally operated by the airlines and this makes them a constituent element of the branding of the relevant airline. Airports in Asia are generally under state control and the architecture of these airports reflects the newly won economic and national self-confidence of these nations. The profile in Europe is as always highly diverse – here there is no clearly universal trend.

Extraordinary Dimensions

The question of what the new third passenger terminal at Frankfurt Airport would look like was not therefore merely an exciting issue for insiders within the air-traffic industry. After all, this terminal would define the next stage of development for the biggest and most important airport in Germany. The operating requirements formulated for the architects' competition in 2001 gave an insight into the extraordinary dimensions of the project: 75 new aircraft parking positions, approximately 25 million passengers each year, maintenance of the guaranteed transfer time from aircraft to aircraft within the time frame of 45 minutes. More than 100 applications were received from architects' practices around the world. 46 invitations were issued to participate in a two-stage selection and optimization process.

After countless working hours and meetings, the world found out how Fraport sees the future. The proposal submitted by winner Christoph Mäckler and adopted in 2005 looks rather sober at first glance. The complex has clearly been designed in the tradition of the functional understatement typical of the Bauhaus school.

Maximum Energy Efficiency

The true value of the new complex lies in the highly flexible modular concept which permits rapid adaptation to the prevailing market and traffic situation. This concept also opens up new scope for building installations that network innovative solutions intelligently and aim to create maximum energy efficiency.

Energy efficient planning creates an “Eco Terminal” at Terminal 3. A beacon for sustainable building technology.



Target CO₂ neutrality

The Fraport planners involved in the origination have been working on system planning since 2005 and they are committed to reducing primary energy consumption and the associated CO₂ emissions as much as possible within the boundaries of the planning parameters. Their objective over the long term is to establish CO₂ neutrality. Sebastian Schulze is the leading project developer at Fraport AG and he has been working on the engineering design of the new terminal. He compares the building with a make of German car: "Lots of new airports are currently being constructed in a design that is rather grand, elaborate and at times very ostentatious. We are setting different priorities and placing particular emphasis on functionality and energy efficiency. Our aim is to create a solution that is consistently robust. The complex being constructed in Frankfurt is

Made in Germany in the best sense. Our new terminal combines the virtues of the classic Mercedes diesel automobile, as manufactured during the 1970s and 1980s: robust, long life, functional and also exceptionally cost-effective to operate."

Exploiting maximum potential

Planning the systems for a large-scale and complex project such as the new Terminal 3 takes many years. In fact, it is really a never-ending story because requirements are continually changing and technical developments keep advancing. Deadlines are nevertheless specified and the entire complex is scheduled to go into operation in the year 2014 or 2015. At the current point in time (April 2008), the responsible planners at Fraport AG are working

on the basis of the following scenarios with respect to energy efficiency:

District heating

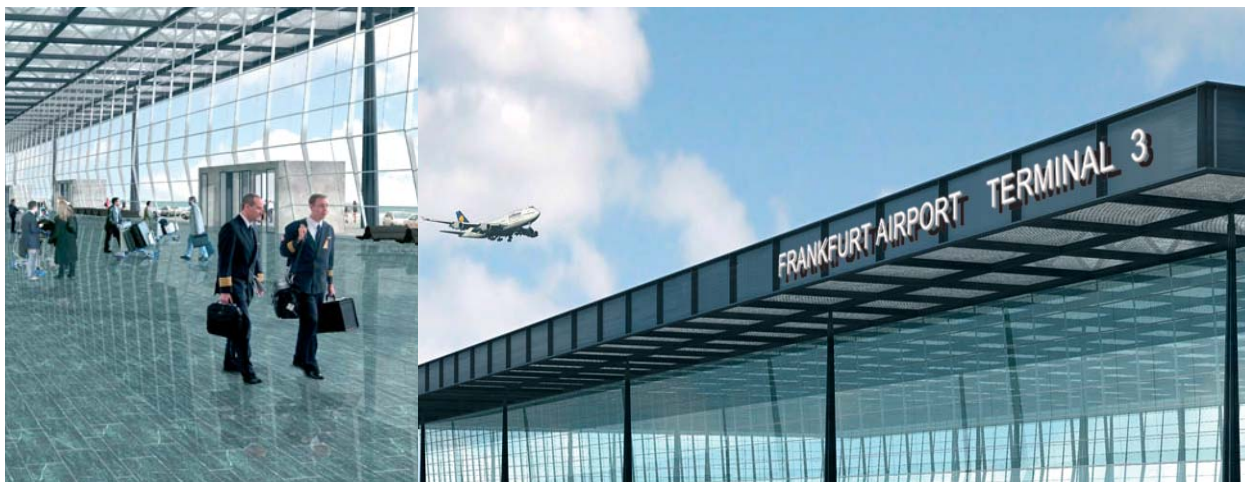
The original idea was to construct a local combined heat and power plant for Terminal 3 which would supply the electricity, heating and cooling needed for the terminal. A different solution was adopted after a number of economic feasibility analyses and environmental impact studies had been carried out. The district heating is supplied by the cogeneration power plant located in Niederrad. Given its size and design, this plant offers a higher level of efficiency in addition to more favorable economic data.

Energy distribution in the terminal

The current planning phases involve an investigation into the engineering options available for effective energy

Geothermal energy at Frankfurt Airport: Electricity and heat from Mother Earth

The specifications for climate protection and rising energy prices are the motivating factor: more and more companies are using renewable energies. Fraport AG is no exception. The Fraport affiliate Energy Air supplies Frankfurt Airport with electricity from suppliers that are now providing the airport with approximately 50 percent of the electricity from alternative energy sources, such as hydropower and wind power. Fraport is also considering the generation of renewable energy on site at the airport. There is a solid geological foundation for taking this approach. The comparatively high temperatures in the rock formations in the extended area of the Rhine Basin might permit profitable exploitation of the geothermal heat for the airport. If the feasibility study currently being carried out (May 2008) is successful, an exploratory program is planned as a follow-on project. If the results of the pilot are positive, Frankfurt Airport could have a dedicated geothermal power plant in the near future which could supply electricity and heat almost round the clock. The technology required for this method of energy generation is basically very simple.



distribution within the terminal. In practical terms, this is about using the waste heat and cooling capacity incurred in certain sections of buildings for purposes of heating and cooling in other parts of the complex.

Geothermal energy near the surface

Can the heat stored in the earth be used to supply energy to Terminal 3? Geological studies suggest that the prospects for this option are promising. If the regulatory authority approves the project, heat exchangers located in the earth or the groundwater could be used to supply the base load to meet the requirement for heating and cooling in the terminal. This could also be used to keep approaches to the terminal free of ice and snow in the winter. This option will therefore be pursued in the context of the ongoing planning process.

Ventilation systems

The use of displacement ventilation systems allows air exchange in ventilation systems to be reduced.

Photovoltaics

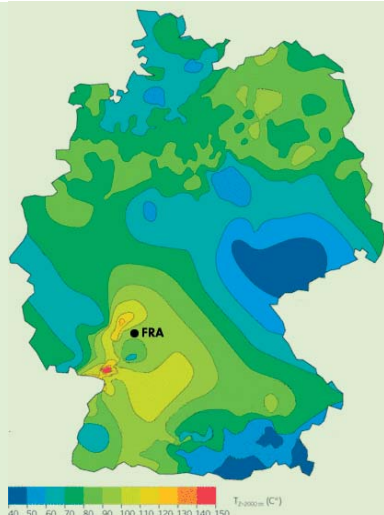
A total area measuring some 18,000 square meters would be usable. This could be fitted with solar panels that would contribute to supplying electricity to the terminal. Peak supply of approximately 1.2 MW could be achieved in this way. However, the general supply of electricity to the terminal must be designed to meet the "conventional" load – not least for reasons of operational safety. More precise studies are also being carried out in this area during the ongoing planning phases.

Thermal component activation

The energy storage effect during the day and at night is exploited through thermal component activation or floor temperature regulation (attenuation) in conjunction with geothermal energy in the check-in hall, at the gates, and in the office areas. A total of approximately 30,000 square meters of active surface is available.

Other energy saving measures

A key contribution to enhanced energy efficiency can also be provided by the use of energy-saving technology. This includes lighting systems and electric motors which can be used for applications such as baggage conveyors, air-conditioning or walkways. ■



Strategic boreholes are drilled to depths of approximately 3,500 to 4,000 meters and the heat stored at sites with hot water or hot rocks, which act as a heat exchanger, at a projected temperature of 160 degrees is exploited. The hot water or steam is transported to the surface of the earth and used to generate electricity and heat buildings. After the water cools down, it is pumped back into the naturally hot rock layers. Thomas Waldmann, who heads the project for Fraport, is hoping for a positive outcome to the preliminary investigations: "It would be an elegant solution for energy supply at Airport City Frankfurt, which would be sustainable and future-proof in every respect."

Fraport



Group



FRAPORT FOCUSES ON GLOBAL ENVIRONMENTAL PROTECTION

One World – Many Airports – One Goal

Germany: Frankfurt Airport (FRA)

Passengers/Freight¹⁾: 54.2 mil/2.2 mil t

Stake³⁾/Type of partner: 100 %

Environmental standard: ISO 14001, EMAS

Germany: Frankfurt-Hahn Airport (HHN)

Passengers/Freight¹⁾: 4.01 mil/112,000 t

Stake³⁾/Type of partner: 65 %/Stake

Environmental standard: ISO 14001

Export of environmental know-how

Airport affiliates/airport management contracts of Fraport AG (2008):

Egypt: Cairo International Airport (CAI)

Passengers/Freight¹⁾: 12.5 mil/ 275,000 t

Stake³⁾/Type of partner: Management contract

Environmental standard: Preparation ISO 14001

Senegal: Dakar Airport

Starts in 2010

Stake³⁾/Type of partner: Management contract

Environmental standard: Preliminary negotiations

Peru: Jorge Chávez International Airport Lima (LIM)

Passengers/Freight¹⁾: 7.5 mil/225,000 t

Stake³⁾/Type of partner: 70 %/Concession

Environmental standard: ISO 14001

Fraport is a global player which is now active at more than 60 sites on four continents through airport investments and associated companies. Environmental management know-how has become a valuable asset as the Group has undergone a process of global expansion, and it will continue to increase in importance.

A Lufthansa Airbus approaches New Delhi, India's second biggest airport. The aircraft is arriving directly from Frankfurt, the passengers include businesspeople, a group of IT specialists, and lots of tourists. Everyone on board knows that India is booming and is one of the big winners in

the globalization process. But this process is also going in the other direction, although a lot of Europeans are tending to ignore this. Fraport holds ten percent of the stock in the New Delhi International Airport (P) Limited (DIAL) and carries out a series of advisory

functions in relation to upgrading, expansion, and operation of this airport through an operational contract. This consulting contract also includes establishment of environmental management. →

Germany: Hannover-Langenhagen Airport (HAJ)

Passengers/Freight¹⁾: 5.6 mil/16,000 t
Stake³⁾/Type of partner: 30 %/stake
Environmental standard: ISO 14001, EMAS

Bulgaria: Varna Airport (VAR)

Passengers/Freight¹⁾: 1.5 mil/117 t
Stake³⁾/Type of partner: 60 %/Concession
Environmental standard: Preparation ISO 14001

Bulgaria: Burgas Airport (BOJ)

Passengers/Freight¹⁾: 1.9 mil/2,052 t
Stake³⁾/Type of partner: 60 %/Concession
Environmental standard: Preparation ISO 14001

Turkey: Antalya International (AYT)

Passengers/Freight¹⁾: 6.5 mil/6,500 t
Stake³⁾/Type of partner: 51 %/Concession, Only terminal operation
Environmental standard: Preparation ISO 14001

China: Xi'an Xianyang International Airport (XIY)

Passengers/Freight¹⁾: 11.3 mil/112,000 t
Stake³⁾/Type of partner: 24,5 % /stake in terminal and multistorey car park
Environmental standard: Preliminary negotiations

India: Indira Gandhi International Airport (DEL)

Passengers/Freight¹⁾: 23.2 mil/433,000 t
Stake³⁾/Type of partner: 10 %/Concession
Environmental standard: Preparation ISO 14001

Saudi Arabia: King Abdulaziz International Airport, Jeddah (JED)

Passengers/Freight²⁾: 13.4 mil/198,000 t
Anteil³⁾/Type of partner: Management contract
Environmental standard: Preliminary negotiations

Saudi Arabia: King Khaled International Airport, Riad (RUH)

Passengers/Freight²⁾: 11.3 mil/191,000 t
Stake³⁾/Type of partner: Management contract
Environmental standard: Preliminary negotiations

¹⁾ Figures for 2007

²⁾ Figures for 2006

³⁾ Complete airport, if special share not indicated

The example of New Delhi represents a development that can be seen all over the world. Today, globalization is not simply restricted to the economic dimension but encompasses virtually all aspects of life in the 21st century. In this context, environmental protection is gaining an ever increasing role – particularly in the emerging economies in the countries of Asia, South America and Africa.

Corporate group-wide environmental policy since 2008

Fraport has a direct shareholding in eight other airports apart from Frankfurt Airport, in Germany and abroad. The group is also active at other airports and companies through affiliates and management contracts. The

key to this successful expansion strategy lies in the operating business segments of the biggest German airport. Decades of experience and expertise at the FRA air traffic hub have created a pool of experience and expertise in management, operations and development of an advanced airport, and this knowledge is an extremely valuable asset that can be applied to other airport sites. Solutions that have proved effective in Frankfurt are in demand in the international marketplace and they have significant value-added. This applies in particular to environmental protection at the airport, which has been gradually developed and perfected in Frankfurt over a period of more than 40 years.

The basis for the environmental protection activities of Fraport AG is the

environmental policy, which sets out the objectives of the Executive Board for sustainable environmental protection. The scope of these goals is restricted to the site at Frankfurt Airport, but in spring 2008 an overarching environment policy was extended to all group sites (see below).

Environmental Management System (EMS) at all sites

Particular emphasis is placed on the development of Environmental Management Systems when the environmental policy is implemented across the group. These systems are tailored to the special conditions of the relevant airport. The basic idea behind this type of systematic approach is the use of indicators to record all the relevant



Environmental Policy for the Fraport Group

The Environmental Policy Statement has been formally adopted and signed by the Board of Fraport AG. It will be communicated to our staff and business partners.

- In developing and operating all our business locations, Fraport AG is committed to manage all airport activities in an environmentally responsible manner. We will strive to protect and create a safe living environment at our business locations by providing our employees with healthy and safe working conditions.
- Maintaining, developing and systematically improving our system of environmental management will support compliance with the applicable laws and regulations and lead to a continuous improvement of our environmental aspects.
- We will undertake initiatives to promote greater environmental responsibility by training our employees and providing awareness programs to the employees on our business locations.
- Our business will support a precautionary approach to environmental challenges respecting the principle that our environmental programs will be cost-effective, economically viable and sustainable.
- We will encourage the development and dissemination of environmentally friendly technologies by applying environmental criteria when selecting goods and services.
- We will provide an annual environmental report of our environmental activities making the information available to both employees and community.

environmental effects at an airport. This provides a verifiable and transparent reflection of environmental aspects such as aircraft noise, air pollution through harmful substances, consumption of resources such as energy and water, CO₂ emissions and waste disposal. The specific data that has been collected over many years constitutes an indispensable basis for effective environmental protection measures: programs for active and passive noise abatement, strategic approaches for air pollution control, major savings on electricity and water consumption, keeping CO₂ emissions to a minimum, development of sustainable recycling management for waste, sophisticated biological renaturing measures such as reforestation to offset the use of land for airport expansions.

Smooth-running environmental management on site is also a necessary precondition for validation in conformity with the European EMAS Eco-Management and Audit Scheme (regulation applicable only to airports within the EU) or certification in conformity with the international environmental standard ISO 14001. Frankfurt Airport has been compliant with both environmental standards since 1999 and 2002 respectively, and a high level of transparency is guaranteed for all the environmental effects relating to the airport. Inclusion of the Fraport share in the major Dow Jones STOXX Sustainability Index and the FTSE4Good provides tangible evidence that institutional investors in particular regard the environmental expertise of Fraport at the Frankfurt Airport site as positive value added for further development of the group.

ISO 14001 is the objective as the international standard for Fraport airports

An increasing number of investments made by Fraport in airports have now been certified in conformity with the

globally accredited environmental management standard ISO 14001. This reference standard defines the focus for a continuous improvement process as a means of achieving the environmental specifications of the relevant airport operator. It is based on the PDCA method (Plan-Do-Check-Act). The foundations for this method are the environmental policy, the environmental goals, the environmental program, and the company's appropriately designed environmental management that facilitates attainment of the projected goals.

The new Athens Airport was the start of this process. Construction work started in 1996 under the management of a Fraport Team and the airport was handed over to the Greek operating company in 2001. An aircraft noise measurement system and an air measurement system were installed at this airport under the control of Fraport specialists. An Environmental Management System was also set up to encompass the entire range of environmental protection measures required. ISO 14001 certification for Athens was carried out in the year 2000.

Fraport also provided support for setting up an Environmental Management System at Lima Airport (Peru) with the initial focus being on calculating noise-optimized routes and removal of asbestos from an old terminal building. The certificate for Lima was issued in the year 2003. An assessment of the environmental aspects and a system of indicators was developed for Lima in conjunction with the Environmental Management Department at Fraport AG. The aim of these measures was to enhance the Environmental Management System. A member of staff from Lima Airport came to Frankfurt specifically for this purpose.

In Germany, the Fraport affiliates Frankfurt-Hahn and Hannover-Langenhagen also have environmental ISO certificates and Hanover is additionally

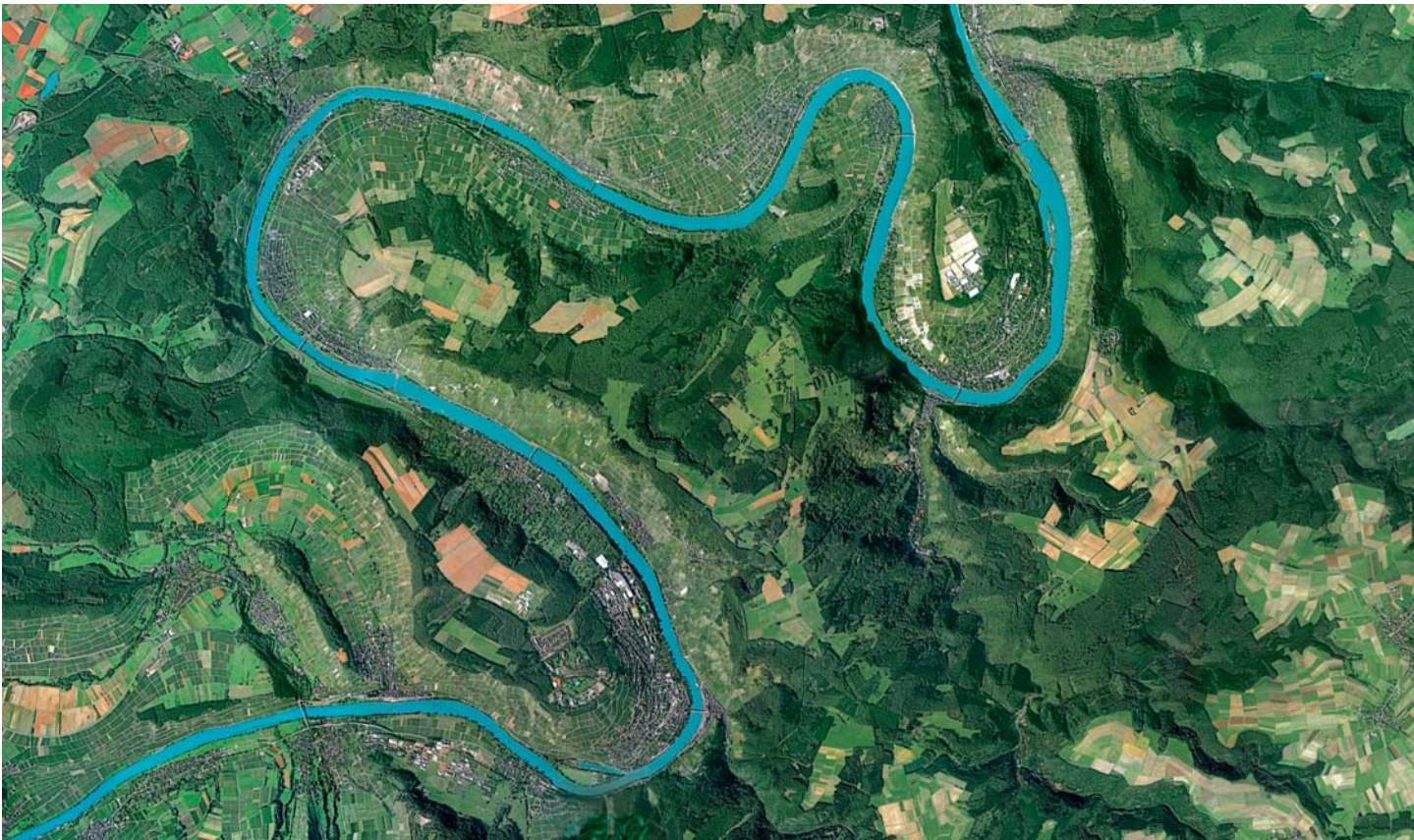
validated in conformity with EMAS. ISO 14001 and EMAS have been designed in a similar way, although ISO only involves certification of a single company, for example the airport operator, while EMAS applies to the entire airport as a site. At a large hub airport like Frankfurt, where more than 500 other companies are based, an EMAS validation is correspondingly more complex.

Preparations for ISO 14001 certification with the support of Fraport Environmental Management are currently being carried out (status May 2008) at the airports in New Delhi and Antalya. Departments for environmental management are being established at Cairo Airport and the two Bulgarian airports Varna and Burgas, and they are working toward certifications over the coming years. Fraport subsidiaries, for example the airport deicing company N*ICE, Fraport Austria and Fraport Cargo Service GmbH Hahn, are currently preparing for certification in conformity with ISO 14001.

All the indicators show that environmental protection will confront the entire airline industry with substantial new challenges over the upcoming years. While airlines will increasingly have to deal with issues in the area of climate protection and global CO₂ reduction, airports will have to focus on a raft of diverse environmental protection measures. Although the focus of these measures will continue to be reduction of aircraft noise, improvement in local air quality and a significant reduction in local CO₂ emissions will also be at the top of the agenda. Professional and certificated environmental management is indispensable for all these equally complex and challenging functions. ■

ENVIRONMENTAL MANAGEMENT AT GERMANY'S BIGGEST LOW-COST AIRPORT

The greening of Hahn



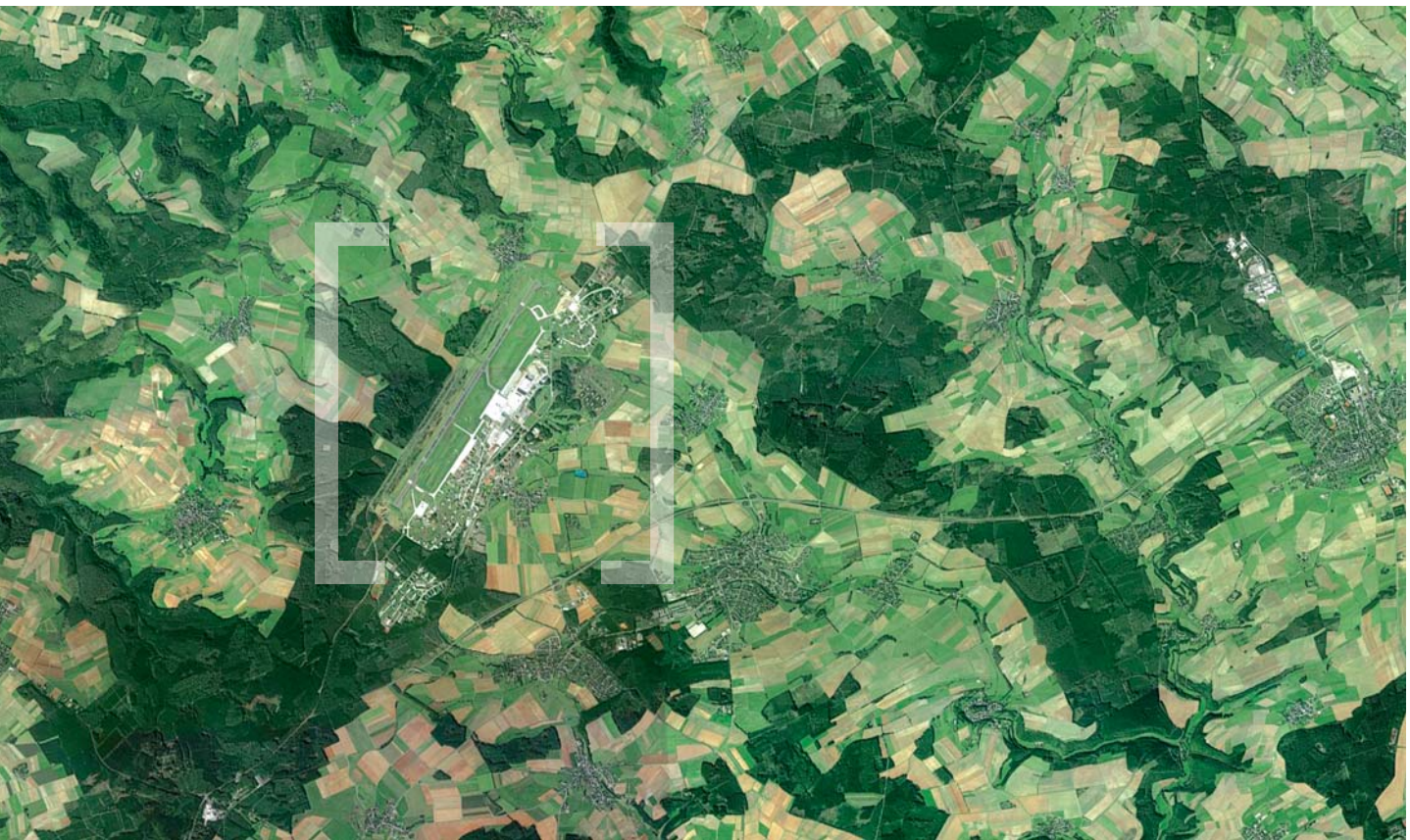
The Hunsrück plateau is located 120 kilometers to the west of Frankfurt, in the west of the hilly uplands of Germany with extensive forests and arable land, small towns and villages with wooden tiled roofs. And suddenly an airport appears on the landscape. Just a few years ago nobody would have thought that this location would develop quite so quickly. Frankfurt-Hahn was created from a former military airfield operated by the

US Air Force in 1993. Today, it numbers among the ten biggest airports in Germany. In 2007, more than four million passengers used the airport, and a total of 290,000 tons of freight were handled.

Why does this operation work here, whereas it would be out of the question at other locations? The most important reasons underlying this success story can be counted on the

The former military airfield at Hahn has been transformed into Germany's biggest low-cost airport.

Fraport AG is the main shareholder¹⁾ in Flughafen Frankfurt-Hahn GmbH. This airport has introduced environmental management – certified in conformity with ISO 14001 – which is specifically tailored to the requirements of the site.



fingers of one hand: deregulation of the European air-traffic market, which has favored the development of low-cost carriers like Ryanair. The visionary corporate policy of the management, which has led market leaders Ryanair to develop Frankfurt-Hahn into its most important site on the Continent. The states of Rhineland-Palatinate and Hesse, who got airport operator Fraport on board with a majority shareholding of 65 percent. Last but not least, Frank-

furt-Hahn has an unrestricted night flight license, which is particularly advantageous for the airlines from the operating perspective.

The area around the airport is very sparsely populated compared with urban areas like the Rhine-Main region, and an increasing number of people from the surrounding area, which is characterized by weak infrastructure, are finding jobs at the flourishing

airport. While around 800 civilians were employed at the American military airfield at the peak of activity there, the airport now employs some 3,500 people to operate the new airport. They include the managers and engineers at Flughafen Frankfurt-Hahn GmbH, who are responsible for environmental management on site. This is certified in conformity with the international environmental standard ISO 14001. →

¹⁾ by the end of 2008



Environmental management with special priorities

The 24-hour flight permit without restrictions does not mean that noise abatement is not an issue at Hahn. The German Aircraft Noise Act is also applicable here and this law has defined comparatively strict limits for aircraft noise for the region around an airport since the amendment in 2007. Frankfurt-Hahn already implemented a passive Noise Abatement Program in the years 1998 to 2004 and installed sound insulation in particularly exposed homes near the airport, and in the take-off and landing zones. Herbert Wichter is the contact for the issue of aircraft noise. Technical Manager of the airport Ulrike Müller describes the program at that time as being ahead of its time: "At the time, we spent some 6.5 million euros in order to install sound insulation windows and low-noise fans. In severe cases we even insulated entire roofs and buildings. Because it was already clear at this point that the regulations of the German Aircraft Noise Act would be much more stringent in the future, we defined generous criteria for participation in the sound abatement program. This has paid off in the long run. The new sound abatement regulations that were approved for the Zoning Plan procedure to extend the landing and take-off runway merely affect 100 to 150 housing units, and a number of institutions qualifying for protection such as nurseries

and retirement homes. A further sum of three million euros has been allocated for this." The way in which the noise abatement regulations have been implemented at Hahn is typical for environmental management at this location. The people affected are approached, a dialog is started up with them, and mutually acceptable arrangements are agreed if possible.

Airport expansion by consensus

The search for effective communication with the surrounding region has contributed to ensuring that the Zoning Plan procedure for extending the take-off and landing runway at the airport could be brought to a successful conclusion without having to engage in time-consuming legal disputes. The management of the airport company wanted to carry out this expansion because it wanted to use bigger cargo aircraft. The longer runway also makes it possible to move the point of touchdown for the aircraft several hundred meters and this reduces the noise experienced in the neighboring community of Lautzenhausen.

Ulrike Müller took part in the discussions with the critics of expansion right from the start: "The nature conservation organizations NABU and BUND had originally stated their opposition to an extension of the runway. Their legal argument was based

on the premises that felling the woodlands necessary for expansion would destroy the habitats of the protected Barbastelle bat. After protracted negotiations, we agreed a common position on forest transformation and reached agreement on close cooperation with subsequent monitoring of the bat population. This was the breakthrough as far as I was concerned." The airport company purchased 15 hectares of forest next to the airport site and agreed to conversion of the woodland to a natural habitat. Regular monitoring started in 2004, and this demonstrated that the habitat of the bats had been largely retained and that the size of their population had not decreased. A consensus was therefore achieved in this case, as well, which satisfied all the parties involved.

"...Electricity and heat are generated at a biogas plant located on the airport site under the management of a private operator. This covers some twelve percent of the energy demand."

Complex drainage necessary

The upland areas of the Hunsrück have a high average annual rainfall of 750 to 800 millimeters and are subject to relatively low average annual temperatures of eight degrees Celsius.

The deicing agents present in surface water present a particular challenge in winter. The wings are de-iced with potassium formate and the aircraft themselves with a glycol concentrate. In order to prevent high concentrations of the glycol concentrate accumulating in the surface water, 70 percent of aircraft deicing agent is sucked up directly at the parking position where the aircraft is being de-iced. Tankers then take the liquid to the biogas plant near Bad Sobernheim where it is converted effectively to electricity and heat. The surface water contaminated with deicing fluid is separated, and if increased concentrations of chemical oxygen are found, temporary storage is carried out in collector tanks with a volume of approximately 10,000 cubic meters and a reservoir with a capacity of approximately 44,000 cubic meters, equivalent to a volume of approximately 20 swimming pools. The contents are then pumped via a pipeline to a purification plant located 10 kilometers away or transported by truck to other purification plants. A complex drainage system with 40 pumps was installed for separation and this is monitored from a central

control center. Waldemar Singer is responsible for operating engineering at the airport and describes the problems associated with this procedure: "Transporting surface water in tankers is naturally not a long-term solution. But so far, the capacities of the purification plants in the vicinity were simply not adequate. This is going to change from 2009. The big new purification plant in Kirchberg will come onstream in 2009 and this will have another pipeline leading directly to the drainage system at our airport." Frankfurt-Hahn has invested 4.5 million euros in financing the plant, which is projected to cost ten million euros to build.

A future with new environmental technology

The environmental managers in Hahn have clear ideas on how the airport should develop over the next few years. One of their main goals is to deploy renewable energies more intensively to replace the heating oil and natural gas used today. An initial stage in this process has already been launched. Electricity and heat are generated at a biogas plant located on the airport site under the management of a private operator. This covers some twelve percent of the energy demand. Future strategies will focus more intensively on co-generation and photovoltaics. A pilot project is already running in

this field. The complex parking guidance system at the airport is operated using solar cells. Alongside deliberations on the deployment of new energies and technologies, intensive research is also investigating ways of saving energy, for example in the terminal and at other operational installations. For example, the installation of waterless urinals will save approximately 4.2 million liters of drinking water each year. The cost savings amount to approx. 33,000 euros each year.

Frankfurt-Hahn is an indication of the fact that environmental management at an airport cannot simply be implemented on the basis of blueprint specifications. The specific features of the business processes and the special circumstances of the economic and social environment combine with the geographical and climatic conditions to set the right priorities individually at each site. Environmental managers require a well-developed sense of the special circumstances and requirements of their particular location. Frankfurt-Hahn is an example of how the right priorities can be defined and successfully implemented. ■



FRAPORT'S PARTNER AEROPUERTO INTERNACIONAL JORGE CHÁVEZ IS GENERATING SUSTAINABLE GROWTH

Showcase Lima

The airport in the Peruvian capital Lima is a model of success in the expansion strategy of the Fraport Group.

Pioneering work is also being carried out here in the area of environmental protection. This work has reaped a number of rewards including certification of environmental management in conformity with the international ISO 14001 environmental standard.



The story of the Fraport investment in Lima airport started in the year 2000, when the airport group from Frankfurt was successful in a competitive tender against international competition for the concession to operate the biggest airport in the country. Operational control of the airport started in February 2001. That year, 4.1 million passengers passed through Lima Airport. By 2006, passenger volumes had already risen to more than six million, and the number of passengers underwent another substantial increase to 7.5 million in the year 2007. This high growth rate demonstrates that investment in upgrading and expansion of the airport has been a worthwhile investment. Holding a majority stake of 70 percent therefore makes absolute sense from the perspective of Fraport. The concession runs until 2031 respectively

2041, and ten million passengers are already projected for the year 2010. The strategic entry into the very promising South American market has been a success, and the airport named Jorge Chávez International Airport after the Peruvian aviation pioneer is developing from a national airport into an international air traffic hub which serves large areas of the southern continent from the western coast of South America.

In 2008, Jorge Chávez International Airport was nominated as the second best airport in South America by Skytrax Research, London. The criteria included environmental protection activities at the airport.

Systematic approach to the goal

One of the key elements in the success story at Lima Airport was that operating company LAP set environmental protection as a priority right from the start and was extremely proactive in implementing the environmental policy with appropriate commitment. The foundation of the approach was an environmental policy that is not only defined on paper but communicated to all the members of staff and fully accepted by them.

This list of targets comprises the following key issues:

- Reduction of emissions caused by the airport and the business processes of LAP – particularly where these impact on the natural environmental conditions.

- Implementation of all statutory and supervisory environmental regulations and all voluntary commitments.
- Development of environmental management that meets all professional requirements for organization and documentation in order to implement environmental goals successfully.
- Regular management reviews within the scope of the Environmental Management System which guarantee continuous improvement of the environmental performance of the company.
- Effective internal communication of the measures and targets defined in the LAP environmental policy, which includes the employees of other companies based at the airport.

An Environmental Management System based on these objectives was developed in parallel with the quality management system at the airport. This project was a big success in 2004, because the LAP Quality Management System was certified in conformity with ISO 9001 and the LAP Environmental Management System was certified in conformity with ISO 14001.

Expanding with environmental protection

The following key program issues were identified and implemented for individual environmental aspects:

- Aircraft noise: New take-off routes were introduced on the basis of aircraft noise calculations worked out by Fraport experts in cooperation with the regulatory authorities.

These measures have significantly reduced noise pollution in the urban area of Lima.

- Air pollution control: A program was implemented for monitoring and avoiding atmospheric pollutants which are emitted by operations and construction activities at the airport.
- Wastewater: Construction of a plant for purifying wastewater from the airport was commissioned by LAP. A special system for treating liquid aircraft waste was also installed.
- Drainage system: All areas of the airport under the responsibility of LAP were provided with new sewer pipes.
- Waste management: The disposal and separation of non-hazardous waste is now state of the art and in conformity with statutory and international standards. Hazardous waste and hazardous waste specifically from construction activities will be collected systematically in future with the aim of guaranteeing disposal of all waste in conformity with standard operating procedures.
- Contaminated areas: Contamination already present on the airport site is removed in line with a soil decontamination program. A special program was also implemented for removing asbestos from buildings.
- Hazardous materials: A safety program identifies hazardous materials and these materials are transported and stored in conformity with the safety regulations.
- Emergency management: Appropriate contingency plans were worked out and implemented for emergencies.

- Bird strike management: A bird-strike management program was implemented to avoid aircraft accidents.
- Drinking water: The water quality is regularly monitored by LAP.
- Communication: Dialog is promoted with the residents living in the district and this communication is to be intensified in the future.

For the coming years, two environmental focuses are planned which will be directed toward conserving resources and CO₂ reduction:

- Water: Water consumption is to be gradually reduced within the scope of a corresponding program. This includes a program for identifying leaks in water pipes and assessing the potential use for of the treated water produced by the purification plant.
- Energy: The consumption of electrical energy is to be reduced with an energy saving plan. A study is also planned for investigating the effects of changing lighting systems in the main terminal and the equipment.

The success story of Lima Airport is exemplary for Fraport and the entire air-traffic industry. The development of airports demands a systematic and uniform sustainable approach today and in the future, irrespective of the particular site involved. Environmental protection that is planned and implemented professionally plays a key role in the development process. ■



FRAPORT SUPPORTS ENVIRONMENTAL MANAGEMENT AT CAIRO AIRPORT

Beyond the Pyramids

Fraport AG has taken over management of Cairo International Airport for a period of eight years. The services provided by the Fraport Team on the ground include support and development of environmental management at the second biggest airport on the African continent.



The international airport located in the north-west of Cairo is the gateway for most visitors from Europe and North America to one of the biggest tourist attractions our planet has to offer: ancient Egypt with its sophisticated culture steeped in myth, the River Nile, the tombs of the pharaohs, and most importantly the pyramids of Giza. This is the only one of the Seven Wonders of the ancient world that has endured over millennia to survive until the present day. Cairo, the capital of Egypt and the biggest city in the Arab world, lies between the airport and Giza. The city itself is home to some eight million inhabitants, while an estimated 25 million

people are believed to live in Greater Cairo. The dimensions of this megapolis alone demonstrate that Cairo Airport is more than just a stopover for tourists. The airport has the second biggest traffic volume in Africa after Johannesburg and it is one of the biggest air traffic hubs in the Middle East. It is the home airport to Egypt Air, which has been part of Star Alliance since July 2008 – the airline alliance of which Lufthansa is also a member. More than 12.5 million passengers used Cairo International in 2007, which represented growth of 16.7 percent compared with the previous year.

Fraport subsidiary takes on airport management

The Cairo Airport Company (CAC), which is responsible for Cairo Airport, has concluded an eight-year management contract with Fraport AG. Since 2005, Fraport AG has provided the CEO and four other members of the Executive Board. The objective of the commitment by the hub experts is to expand the airport, upgrade the facilities at the airport, and adapt them to international service and safety standards. Environmental management is at the top of the agenda. Executive managers in Cairo are committed to developing all aspects of their airport

so that it is competitive in the international market. This is not an easy mission in contrast to the other attractive hub airports in the Middle East like Dubai and Qatar, but Cairo has every reason to be proud. The airport has three runways and will soon boast three terminals (status April 2008). It thereby meets the standards of the international air-traffic industry. This is also true for environmental management, which has been able to make remarkable advances on noise abatement, air purity and waste management during recent years.

Data for environmental protection

The Environmental Department at Cairo Airport was established in August 2004. The first step involved development of a training plan geared toward preparing the team of environmental managers for their future functions. Fraport provided support and contributed the know-how necessary for developing environmental management at a big hub airport. The actual training was delivered in two phases between January 2006 and September 2007. Measurement programs were prepared in parallel for calculating the key data required for implementing efficient environmental protection measures. The executive environmental manager, Moshira Fahmy, is definite: "You can only address the right issues and implement improvements strategically if you have informative data."

Over the course of 2007, an advanced noise measurement system was installed at Cairo Airport. Six measuring stations were set up within the airport and five other stations were established around the airport along the air routes. A mobile measuring station was also procured and placed at the disposal of the surrounding communities for precise calculation of aircraft noise pollution. All noise data are collected at an evaluation center on the airport site and analyzed there. The monitoring currently carried out at Cairo Airport is part of a national Egyptian environmental program directed toward noise abatement and improvement of air quality.

Data on air quality is recorded in addition to analysis of aircraft noise pollution. Two air measuring stations are positioned such that the effects of aircraft movements on air quality in the vicinity of the airport can be verified.

Another focus of environmental management at Cairo International Airport is disposal of toxic waste. Systematic preparation is also essential in this area. The first step is to record the volumes of waste produced, define the origin of the waste, and classify the potential hazard. Effective countermeasures can then be designed and implemented. Experts are necessary in both cases, and a team is currently being put together and trained specifically for waste management.

Goals in the near future

Cairo Airport is set for a period of rapid growth over the coming years and this will present environmental management with new challenges. Against the background of this development, environmental manager Fahmy emphasizes the importance of continuous and systematic work: "During the past two years, we have put in place the technical and human-resource assets that are necessary for dependable monitoring of noise and atmospheric pollution. The focus will now be on recording and evaluating the appropriate data. This will soon enable us to develop efficient and sustainable measures for protecting the environment, the region and its population as our airport undergoes further expansion." ■

1 | Terminal Cairo Airport.

2 | Environmental Management Team in Cairo (from left): Mohamed Sherby, Samar Sadik, Moshira Fahmy (HoD), Sanaa Shamik, Dalia Mohsen and Seham Ehsan.



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ENVIRONMENTAL PROTECTION ACTIVITIES AT INDIRA GANDHI INTERNATIONAL AIRPORT

At the center of tomorrow's market

Fraport holds a stake of ten percent in the airport of the Indian capital and the concession granted by its subsidiary company also confers responsibility for operation, management and development. This presents the group with new challenges on environmental management in a region where the air-traffic industry is set to change in many respects over the coming decades.



India's economy is booming. The emerging country has more than 1.1 billion inhabitants and covers an area exceeding three million square kilometers. Alongside China, it numbers among the big winners from globalization in recent years. Although per capita income of the population overall is still at a very low level, some regions of the country are developing companies which are able to compete in the international marketplace in areas like information technology or pharmacy. Today, India has a small but rapidly growing middle class. Commentators in India and foreign institutions and investors assess the future

economic prospects as exceptionally good. However, infrastructure is a big problem in this nation, given the many different ethnic groups and the very large geographical area. Transport systems and energy supply are regarded as inadequate and obsolete, and these are obviously significant hindrances to an advancement of economic prosperity.

Observers need to analyze the special situation of the country if the importance and perspectives of air traffic in India are to be assessed realistically. The majority of experts is assuming that the major momentum for growth

in the global air-traffic industry will be generated in Asia – primarily in China and India. The greatest growth will take place here and environmental impacts such as CO₂ emissions and rising consumption of all forms of resource will increase. If we look at the situation in light of this perspective, starting to implement an advanced environmental management program at the major airports in India is certainly not a luxury.

Fraport joins Delhi

Since 2006, Fraport has held a ten percent stake at the Indira Gandhi International Airport (DEL) in Delhi. The joint venture company Delhi International Airport Private Limited (DIAL) is the owner of a concession running for 30 years and governs the key operating activities at the airport: operations, management, and airport development. Delhi is already the second biggest airport in India with more than 23 million passengers and 432,000 tons of airfreight. Moreover, it also looks set to be ranked number one in the near future. Growth forecasts for the coming years fluctuate between ten and 15 percent, and capacity at DEL is therefore being expanded to accommodate 35 million passengers by 2010 – mainly thanks to the launch of a new third terminal. There are already plans for further expansion to accommodate 75 million passengers after the new terminal has been opened.

Fraport is also playing a major role in the development and planning of environmental management at Delhi Airport. The environmental managers at DIAL regularly swap ideas with their colleagues from Frankfurt and close contacts are also being maintained on environmental issues in operational areas. Waste is a key environmental aspect for Delhi Airport at the moment. Significant progress has been made on waste management during recent years. The airport now has an efficient waste management system in confor-

mity with all the statutory regulations. Waste from aircraft, terminals, and hangars, and most particularly hazardous waste such as used oil from vehicles and ground support equipment is collected, separated into the different categories and hazard levels, and disposed of in conformity with the regulations. Special emphasis is placed on education and training of the personnel responsible for disposal in accordance with the standard operating procedures.

The DIAL environmental management has just started to install water meters for the water supply in order to obtain reliable data about consumption. Rainwater collected at the airport is conducted strategically to the ground-water in order to secure the supply of water to the airport. All wastewater produced is purified in a plant specially installed at the airport for this purpose.

The air quality at the airport is continually measured in a monitoring program and the results are published. This allows compliance with the specified limits to be checked prior to introducing any measures necessary for improving the air quality.

As at most of the world's airports, aircraft noise is an issue at Delhi. Significant efforts are currently being made to improve aircraft noise management at the airport itself and in the surrounding region. A system for measuring aircraft noise forms the basis for this program. The system

comprises six fixed measuring stations that will soon be supplemented by a mobile station. The measured data are recorded and evaluated by state-of-the-art software.

Promoting traffic growth and limiting environmental impact

The dynamic growth at Indira Gandhi International Airport will present the DIAL environmental management with significant challenges during the coming years. On the one hand, the airport operator will intensify and concentrate activities on all areas where direct influence can be exerted. On the other hand, a start has already been made on implementing mandatory measures for companies that are based at the airport. A reference standard has been drawn up that compels airlines and suppliers of ground support equipment to optimize their environmental management and comply with the environmental standards at the airport. ■

1 | *The planned new terminal.*

2 | *The Environmental Management Team*

(from left): Murugesan Muthukrishnan, Kabir Kardian, Praveen Puri (General Manager Environment), Sanjay K. Singh, Reena Singh.



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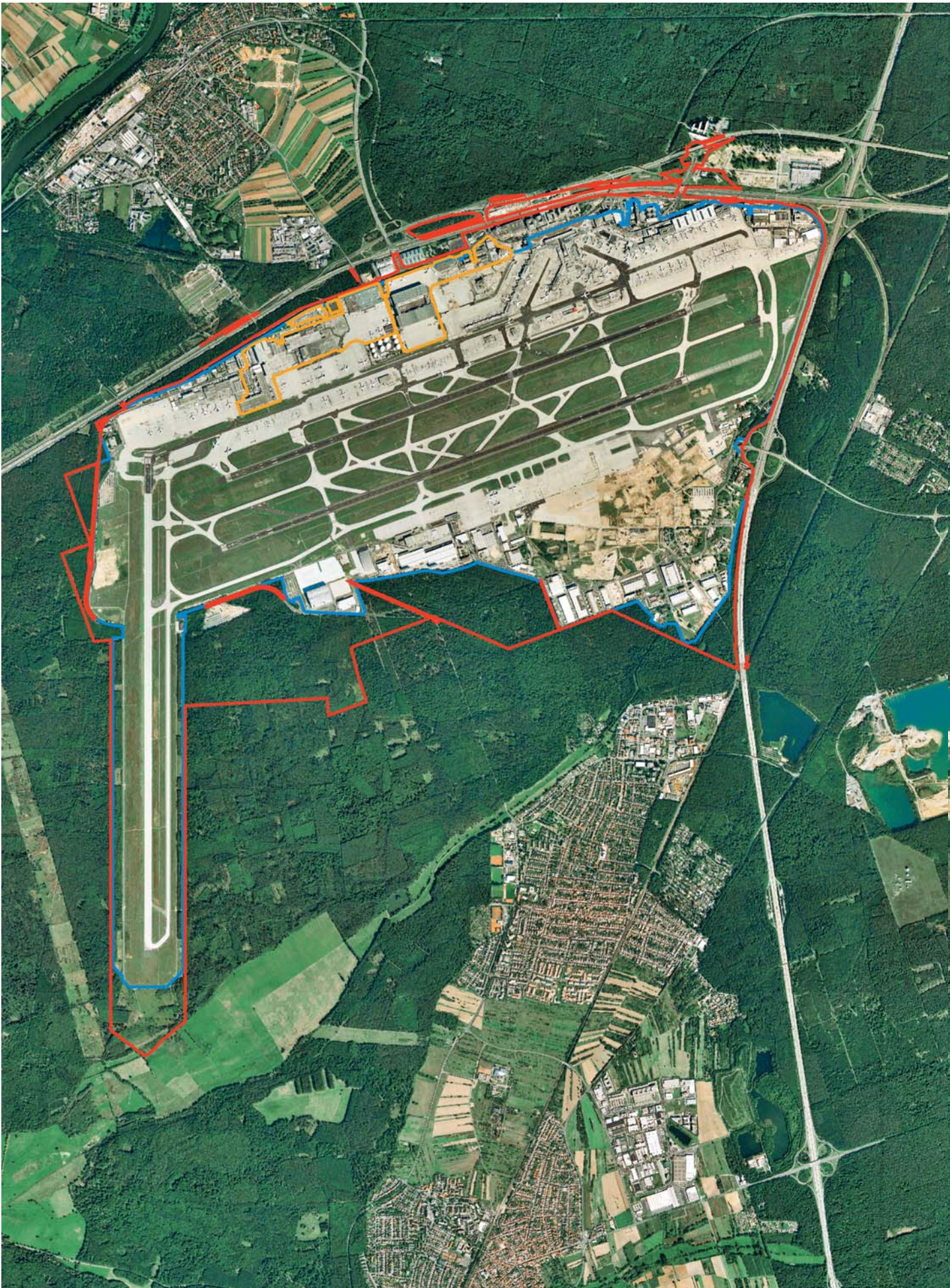
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Environmental indicators 2006 and 2007 (see inside coverpage)

Validation (see rear coverpage)

Unless otherwise identified, the details of this Environmental Statement are based on internal data that has been directly or indirectly collected by Fraport.



— Total integrated floor space at FRA location

— Operational area

— Zone managed by Deutsche Lufthansa



FRA and Fraport AG

Historical highlights for the development of the airport and environmental protection

In 2006, Frankfurt Airport celebrated its 70th birthday on the current site.

1924	Südwestdeutsche Luftverkehrs AG (Southwest German Air Traffic corporation) was founded.
1936	"Rhine-Main" began flight operations, airships (dirigibles) were a popular mode of transport.
1945	US Air Base constructed.
1949	Parallel take-off and landing system went into service.
1964	Implementation of the first aircraft noise monitoring system.
1965	Introduction of the first noise optimized "Minimum Noise Routes".
1966	First German Aircraft Noise Abatement Commission established.
1971	First restrictions on night flights.
1972	Fraport declares environmental protection as part of company policy.
1972	Introduction of the Frankfurt low noise descent approach "low drag – low power".
1972	Terminal 1 inaugurated.
1980	Underground railway station came on line.
1983	First Passive Noise Abatement Program around FRA.
1984	Runway 18 West completed.
1993	Introduction of variable airport charges based on noise levels.
1994	Terminal 2 opened and the Sky Line automatic passenger transfer system became operational.
1999	Long-distance railway station commenced operations.
1999	First validation of Fraport's Environmental Management System in conformity with EMAS.
1999	Start of mediation procedure on airport expansion.
2001	Second Passive Noise Abatement Program is set up.
2002	First certification of Fraport's Environmental Management in conformity with ISO 14001.
2002	Introduction of air quality measuring stations on the airport site.
2005	CDA landing procedures are introduced for night flights.
2007	Approval of the Zoning Plan for the airport expansion is made public.
2008	Climate protection program at the airport for CO ₂ reduction.
2008	Adoption of a group-wide Environmental Policy.

Leading Edge Worldwide

Transportation figures and basic data for 2007

Terminals		2
Passengers		54.2 mil
Passengers per day ¹⁾		148,400
Airfreight	[t]	2.095 mil
Airmail	[t]	95 ths
Daily cargo volume ¹⁾	[t]	approx. 5,700
Aircraft movements		492,569
Take-offs and landings per day ¹⁾		approx. 1,350
Passengers per aircraft movement		119
Seat load factor	[%]	75.8
Airlines 2008 ²⁾		125
Destinations 2008 ²⁾		307 in 109 countries
Percentage of transfer passengers ³⁾ [%]		53
Trains per day (regional)		218
Trains per day (long distance)		175
Total number of jobs (at airport)		approx. 70,000
Total integrated floor space		
at FRA location	[km ²]	approx. 19.06
Operational area	[km ²]	approx. 15.70
Number of companies and government agencies		approx. 500
Retail shops		over 200

¹⁾ average ²⁾ summer scheduled flights

³⁾ aircraft to aircraft

Frankfurt Airport and its operator Fraport AG

In terms of passenger traffic, Frankfurt Airport is the third busiest airport in Europe, after London-Heathrow and Paris-Charles de Gaulle. It is the biggest airport in Germany and one of the world's most important hub airports for transfer passengers. Frankfurt took eighth place for passengers and freight in the global airport ranking carried out in 2007.

A total of 54.2 million passengers were carried and 2.1 million tons of freight were shipped, excluding mail. Frankfurt Airport is also the largest local place of employment in Germany with more than 70,000 employees. With a catchment area of 200 km radius and 38 million people, Frankfurt Airport has the largest catchment area of any European airport.

Fraport AG corporate data 2007

Employees of the Fraport Group ¹⁾		30,437
Employees of Fraport AG located at FRA		12,533
Employees of Fraport AG and affiliated companies located at FRA		17,796
Group revenue	[€]	2,329.0 mil
Group annual profit	[€]	213.7 mil

¹⁾ annual average

Hub function relieves strain on the environment

Frankfurt Airport is a major transportation hub connecting the European and intercontinental air networks. In 2007, approximately 53 percent of all passengers passing through the airport facilities transferred to flights for other destinations. The prime environmental benefit derived from bundling air traffic is the reduction in the number of direct flights between smaller airports, while also allowing larger aircraft to be deployed on intercontinental routes. This creates a more favorable balance between structural weight, payload, and fuel consumption. Lufthansa has located its operations base at Frankfurt Airport to take advantage of the hub function.

Another key aspect of the hub function relates to the increasing significance of intermodal transportation which integrates air and rail travel. Frankfurt Airport boasts an excellent link with the German high-speed train network at its AIRail Terminal and this meant that 17 percent of originating passengers used high-speed trains (ICE) in 2007. Fraport AG continually endeavors to develop the infrastructure and services at Frankfurt Airport as an intermodal junction. This issue is a central goal of Fraport's corporate strategy.

The airport group Fraport AG

The owner and operator of Frankfurt Airport is Fraport AG Frankfurt Airport Services Worldwide. Fraport additionally holds shares in more than 50 companies worldwide. The majority of the stocks in the Fraport Group are publicly owned by the State of Hesse and the City of Frankfurt Main. The company's shares are traded on the Frankfurt Stock Exchange and are listed on the MDAX.

Fraport AG corporate structure

The current organization of Fraport is structured as follows:

- Four strategic business units
- Seven central units
- Two service units
- Nine staff departments that report directly to the Executive Board

The units described below are important components of airport operations. They are significant for airport development and expansion, and make a major contribution to efficient environmental management.

Traffic and Terminal Management, Airport Expansion (FBA)

Within Fraport's Environmental Management System, FBA is in charge of operational environmental protection activities associated with the take-off and landing runway systems, aprons, taxiways, both terminals, and gate and parking positions. FBA also operates the aircraft noise monitoring system and carries out aircraft noise calculations. The airport charges and charges based on emissions are also determined by FBA.

Expansion is the business area within FBA that manages the entire planning and implementation process related to the expansion of capacity at Frankfurt Airport. The environmental impacts arising from this process are dealt with in this forum, especially in regard to noise, air quality, flora, fauna and biotopes. Mitigation and renaturation activities during the course of the airport expansion are supervised by FBA.

The framework of the current approval process concerning the expansion of the airport commissions internal and external experts to analyze the general environmental effects exerted by the airport. Potential ecological impacts due to airport expansion projects and the operation of the new complex are assessed in detail.

Airport Security Management (ASM)

ASM carries out environmental management functions that target preventative measures for possible environmental impacts. These include air security, airport safety, emergency management, and fire protection combined with appropriate training and advanced training measures.

Ground Services (BVD)

The services provided by BVD include ramp services (ground handling, loading and unloading, toilet service and waste disposal services from aircraft, water supply for aircraft, push back, cargo- and mail transport), baggage handling (air baggage transportation), and passenger services (check-in, boarding, baggage checks, assistance, ticket sales, etc). BVD maintains its own fleet of vehicles to provide services on the apron. The vehicle fleet includes mobile units and ground support equipment (aircraft trucks and baggage trucks, stairs) and vehicles (buses, supply and disposal trucks). Vehicles are generally powered by diesel.

Real Estate and Facility Management (IFM)

Real Estate and Facility Management (IFM) is responsible for the planning, construction, maintenance, and marketing of all floor space and buildings at the airport. Within Fraport's Environmental Management System, IFM is particularly involved with landscape planning, winter services, real-estate management, workshop areas, maintenance of mobile ground support equipment and vehicles, the filling stations, goods receiving areas, floor space management and land-registers.

Retail and Properties (HVM)

HVM is responsible for the development, marketing and lease management at the airport. Multi-purpose real estate is being developed, including office space near the terminals, innovative real-estate concepts, and suitable parking facilities. This department cooperates with two subsidiary companies: Energy Air GmbH (supplying Frankfurt Airport with energy) and Flughafen Service GmbH (specialized in waste disposal). Within Fraport's Environmental Management System, HVM is primarily responsible for operating energy and waste management, clean-up of contaminated areas, transport links to the public road network, and parking on the airport site.

Central Purchasing, Construction Contracts (ZEB)

All purchasing and procurement is concentrated within this central unit (ZEB) at Fraport. This allows ecological criteria and targets to be implemented effectively (for example, purchasing operating materials).

Human Resources (PSL)

Human Resources (PSL) plans and implements training and further training courses dealing with environmental topics. Occupational safety, health protection, occupational medicine, and the airport hospital are assigned to this unit, as well as the environmental officer for hazardous materials and radiation protection.

Environmental Management (VAU)

VAU is a staff department accountable to the Executive Board that is responsible for coordinating and developing environmental management strategically. Environmental Management also looks after the maintenance and further development of the Environmental Management System at Frankfurt Airport. The department offers guidance to the subsidiaries and the affiliated companies within the group about environmental management and environmental protection. The environmental officer responsible for water protection and waste are also assigned here.

The Environmental Management System (EMS) of Fraport AG

Objectives and organization

The Environmental Management System (EMS) of Fraport AG was set up at Frankfurt Airport in 1999 in accordance with the EMAS -standards on environmental management and environmental audit (Regulation (EC) No. 761/2001). In addition, Fraport AG has been certified in conformity with the international ISO 14001 standards since 2002.

Validation in conformity with EMAS confirms that Fraport AG

- operates its facilities and processes in conformity with the applicable legal standards (legal conformity);
- has introduced and successfully implemented systematic procedures directed toward operational environmental protection;
- works to continually improve its environmental performance and implements any potential improvements, provided implementation is not precluded by economic reasons;
- informs the public as appropriate about its key environmental impacts and environmental performance.

The objectives for the EMS at the FRA site are stated in the corporate Environmental Policy defined by the Executive Board and the Environmental Policy for Frankfurt Airport. These policies are implemented in the form of the environmental program. The focus of EMS is on operational implementation of environmental targets and measures within the business areas, and maintenance and further development of the organization as a whole.

Structure and functions

The environmental management officer advises the Executive Board and senior management on all issues related to environmental management. This officer also handles the necessary organizational and coordination functions and authorizes the internal environmental audit and external auditing of the Environmental Management System (in conformity with EMAS and ISO 14001). The Vice President of the Environmental Management Division (VAU) and the environmental management officer report to the Executive Director of Labor Relations, who is one of the four members of the Executive Board at Fraport AG.

Environmental officers in charge of waste management and water protection are integrated within VAU. The environmental officer in charge of hazardous materials and radiation protection is assigned to the Occupational Safety Department (PSL-A).

The directors of the business units are responsible for environmental issues. Organization of duties is devolved to the relevant management tiers. The environmental management officer and the environmental officers provide additional support on environmental issues to the operating units.

Components of the EMS

The key components of the EMS are:

- *The Environmental Program includes* targets, measures, resources, responsibilities, and deadlines for taking action.
- *Internal Standard Operating Procedures, Company Regulations and Work Instructions* Binding regulations that facilitate transparent workflows.
- *Internal Environmental Audits* Audits that review compliance with legal guidelines, regulatory requirements, and company regulations.
- *Assessment of Environmental Issues* Legal guidelines, standards defined by accredited institutions, benchmarks, technical and scientific findings, and concerns voiced by interest groups within the public domain are crucially important for the assessment.
- *The System of Environmental Indicators* Evaluation of environmental aspects is supported by key environmental indicators representing all relevant environmental aspects.
- *Management Review* The environmental management officer submits an annual report which the Executive Board uses as a basis for their management review.

The Environmental Policy

Employee training in the EMS

Human Resources (PSL) is responsible for training and advanced training on environmental issues for employees, environmental auditors, and managers. The department also delivers statutory training courses on the transport of hazardous materials and radiation protection.

Influencing third parties

Fraport AG is able to exert a limited amount of indirect influence over the environmental behavior of the companies and agencies located at the airport on the basis of the airport user regulations and other regulations. Any discrepancies or irregularities identified by Fraport AG are brought to the attention of the management of the relevant entity. Appropriate solutions are discussed, and once a course of action has been decided the solution is implemented, with appropriate support.

Environmental protection at Frankfurt Airport is incorporated in the group-wide sustainability strategy, which constitutes a primary objective of Fraport AG and is based on economic, ecological, and social criteria (see the Annual Report 2007). The corporate goal of sustainability is an expression of Fraport's commitment to all its stakeholders – shareholders, customers, suppliers, contractors, employees, and the population living in the surrounding areas. This commitment makes environmental management a central plank of the corporation's strategy. The Executive Board of Fraport AG adopted the Environmental Policy, derived from this vision, in May 2008 (see chapter "Fraport focuses on global environmental protection", "One World – Many Airports – One Goal", page 68). The environmental issues of climate protection and biodiversity are governed by additional policies:

Climate protection principles

We participate in climate protection to ensure the sustainable development of our Group. Fraport is committed to the Kyoto Protocol and aspires to limit the output of relevant greenhouse gases to minimum emissions. We are also involved in local and regional initiatives addressing climate issues within the Agenda 21 process concerning issues relevant for climate protection. Our climate protection activities also make a long-term contribution to limiting the risks arising from altered weather conditions caused by climate change. We are therefore contributing to the sustainable development of our location.

Biodiversity principles

Our businesses and the protection of natural biodiversity can be reconciled. Natural and semi-natural areas and their inherent biodiversity are conserved and supported to the extent possible within operational guidelines, and operational disruptions are kept to a minimum. If significant interventions are made in the natural environment, equivalent compensation or substitution is provided including the guarantee of long-term maintenance of purpose.

Environmental aspects

Actively protecting the environment

The following chapters offer an overview of all environmental issues at Frankfurt Airport. The associated environmental effects and impacts are described and where possible assessed, on the basis of the relevant legislation and regulations.

The goals and measures arising from the assessment of the various environmental issues are then introduced. The concluding part summarizes the most important goals and measures to provide a succinct overview of the wide array of environmental protection projects at the airport.

Climate protection

“Weather” and “climate” are the result of the interaction of numerous natural and anthropogenic factors. Unlike the weather, which we experience every day, climate describes weather patterns over a longer period of time. Climate and weather are both subject to changes. Geological analyses, glacial drill-holes, tree-ring and pollen analyses, and human records – if available – provide the data to reconstruct the process of climate change. These data are used to verify climate models used by scientists to establish trends for the development of the Earth’s climate.

The composition of the earth’s atmosphere is a key parameter for the climate, in particular the concentration of greenhouse gases – carbon dioxide, methane, and nitrous oxide (N₂O). Water vapor and ozone, aerosols and particles also play an important role. These gases, particles, and vapors partly originate naturally but they are increasingly also a result of human activity. The carbon-dioxide concentration in the atmosphere has risen approximately 35 percent since the start of industrialization.

The impact of humans on the earth’s climate was first discussed in public on a large scale at the United Nations World Climate Conference held in Rio de Janeiro in 1992. The United Nations Framework Convention on Climate Change signed in Rio led to the “Kyoto Protocol” (1997, in force since 2005), which was agreed at the United Nations Conference on Environment and Development in Kyoto, Japan. The protocol and the goals formulated in the protocol expire in 2012. Negotiations are currently in progress for a second commitment period starting in 2013.

Goals for reducing carbon dioxide were already defined in Germany in 1995 and then continued in various programs. The provisional goal is the Integrated Energy and Climate Program (August 2007). For Germany, this stipulates a 40 percent reduction in greenhouse gas emissions based on 1990 values by the year 2020. Big polluters in Germany, such as power plants and industrial plants, have been subject to emissions trading since January 1, 2005.

Air traffic is one of many contributors to climate change in the context of global transport systems. Approximately 14 percent of CO₂ emissions produced by human activity worldwide are caused by road traffic, approximately 2.7 percent by shipping traffic, and 2.2 percent by air traffic (DLR – German Aerospace Center, 2006, 2008). A significant proportion of the latter is emitted in international airspace. According to the National Inventory Report 2007 issued by the German Federal Environmental Agency, the percentage of CO₂ emissions arising from the air-traffic industry in Germany was just 0.48 percent out of total emissions due to human activity in Germany for 2005 (UBA – Federal Environmental Agency 2007).

The Kyoto Protocol does not regulate air traffic emissions, but rather obliges signatories to comply within the framework of cooperation in the context of the International Civil Aviation Organization (ICAO). The ICAO already formulated the goal to reduce greenhouse gas emissions from air traffic in 2004. Optimization of flight routes, technological improvements in aircraft, improvement of ground and air processes, as well as free-market instruments are the focus of the discussions. Another option is the development of alternative fuels, an option which is more of a vision at present. The specified options were combined in the “Four Pillar Strategy” put forward by the International Air Transport Association (IATA) in 2007.

The proposals by ICAO and IATA are primarily directed toward airlines, aircraft manufacturers, and air-traffic control. However, the aircraft industry has also been working on the problem. Present-day jet aircraft consume 50 percent less fuel than jet aircraft 40 years ago. Lufthansa, for example, improved fuel efficiency in the hauling capacity of their fleet by 3.4 percent each year from 1991 until 2005, or by 52 percent over the past 10 years. A further increase in fuel efficiency of at least 25 percent is expected in the air transport system by the year 2020, based on figures from the year 2000 (DLR, 2008). The Advisory Council for Aeronautics Research in Europe (ACARE) supports technological developments on a European level. In Germany, the Air Traffic for Germany Initiative (ILfD), a joint venture between Deutsche Lufthansa AG (DLH), Fraport AG, Flughafen München GmbH (FMG), and German Air Traffic Control (DFS) adopted the proposals from the Four Pillar model for climate protection. Fraport can contribute directly to the pillars “Improved Infrastructure” and “Operating Measures.”

The risks and opportunities of climate protection are also the subject of discussion within the airport umbrella associations. Aside from the minimization of in-house emissions, for example from ground traffic and airport infrastructure, discussions on how airlines can be supported in their efforts to reduce emissions are also being carried out. A declaration was signed at the 3rd Aviation and Environment Summit held by the Airports Council International in Geneva on April 23, 2008, which defines the responsibility of the global aviation industry in matters of climate change. The declaration – which was signed by Fraport AG – recommends support for development and use of new technologies to reduce the emission of greenhouse gases – such as optimization of consumption, flight procedures, and ground traffic at airports, and pollutant-free fuels. Moreover, air traffic management and airport infrastructure need to be improved. The conference appealed to the governments of the represented countries to support the development of a global emissions management program by the International Civil Aviation Organization (ICAO).

However, the expected growth in global air traffic leads to one conclusion, despite all efforts to economize: carbon-dioxide emissions are initially going to continue to rise in the upcoming years. The EU therefore plans to incorporate the air-traffic industry into the emissions trading scheme from the year 2012.

Fraport has defined and publicized policies for climate protection. They constitute the principles of the Environmental Policy of Fraport AG. The continuous internal environmental audits and an external environmental auditor monitor compliance with this policy.

The source of greenhouse gases at the airport

The greenhouse gas emissions at the airport are primarily a result of the operation and maintenance of aircraft, handling aircraft on the ground, operation of airport facilities and infrastructure, as well as ground traffic. These emissions originate from various sources. Aside from airport operator Fraport, the airlines and the numerous other companies operating at the airport are the major contributors. A further source is the arrival and departure of employees, passengers, and visitors. A simplified overview of the emissions sources and the major causal agents are presented in the following table, which is based on the specifications of the 2007 ICAO "Airport Air Quality Guidance Manual" (ICAO DOC 9889).

Fraport appears as a direct emitter and as an indirect polluter or a contributory polluter giving off emissions, according to the international reporting standards for greenhouse gas emissions by companies, drawn up by the Greenhouse Gas Protocol Initiative (GHG Protocol). This classification divides the emissions into three so-called "Scopes", on the basis of their origin. According to the GHG Protocol, direct emissions, known as "Scope 1" emissions, are emissions that are generated and controlled directly as part of the business activity of the company, for example the combustion of fuel in company vehicles. Indirect emissions, known as "Scope 2" emissions, are emissions that arise from the

generation of purchased energy (especially electricity) consumed by the company. Scope 3 emissions are (indirect) emissions that arise as a consequence of the activities of the company, but are generated from sources not owned or controlled by the company.

Attribution of the emissions sources at Frankfurt to the Scopes from the point of view of Fraport AG is also specified in the table. Scope 3 emissions relate indirectly to the operational activities of Fraport AG, since a considerable part of the company's earnings are generated from the underlying processes either directly or indirectly (emissions from air traffic and the arriving and departing passengers), or constitute a fundamental requirement for carrying out the company's objectives (emissions from the arrival and departure of employees). Scope 3 also includes the emissions from business trips by employees, which do not yet have a slot in the ICAO classification.

The greenhouse gas emissions of Fraport AG have been reported to EIRIS (Ethical Investment Research Service, London) and SAM (Sustainable Asset Management, Zurich) since 2006 and within the Carbon Disclosure Project to the extent that reliable findings are available. Fraport is then assessed on the basis of the requirements of FTSE and DJSI sustainability indexes.

Sources and emitters of greenhouse gases at the Airport

Class/Source ¹⁾	Scope ²⁾ Fraport AG	Further contributors
Aircraft emissions		
Main engines	3	Airlines
Auxiliary power units	3	Airlines
Emissions from aircraft handling		
Ground support equipment and mobile ground electricity supply	1	Third-party handlers, airlines
Handling vehicles, catering, etc.	1	Third-party handlers, airlines
Emissions from the operation of infrastructure		
Generation of electricity and heat	2	Third parties
Emergency power units	1	–
Aircraft maintenance	–	Third parties, airlines
Firefighter training	1	–
Emissions from ground traffic		
Vehicles	3	Passengers, visitors, delivery
Public traffic	3	companies, staff employed by third parties

¹⁾ Analysis in conformity with ICAO DOC 9889 "Airport Air Quality Guidance Manual", 2007, amended

²⁾ Allocation of the Scopes from the perspective of Fraport AG in conformity with the Greenhouse Gas Protocol

Airport greenhouse gas emissions

According to the Kyoto Protocol, all climate-changing gases have to be taken into account for purposes of climate protection. However, the only gas that accrues in significant quantities at the airport is CO₂.

Direct carbon-dioxide emissions at the airport site amounted to approximately 789,000 tons in the year 2005, according to the calculations carried out in the context of the Zoning Plan procedure. This includes aircraft emissions up to 300m above the ground (representing over 92 percent), emissions from stationary sources (approximately 4.3 percent of the total amount), and the emissions from landside traffic on the apron and service roads (approximately 3.4 percent of the total amount). Indirect carbon-dioxide emissions were generated from the production of energy consumed on-site (approximately 422,000 tons) and an additional 315,000 tons from road traffic generated by the airport in the immediate vicinity and in the region.

Emissions from the operation of aircraft can easily be extrapolated for the subsequent years, as can the values for indirect emissions derived from electricity, district heating, and district cooling. However, extrapolation of the emission values from stationary sources, apron traffic, service roads, and traffic in the vicinity and region derived from the airport still present significant methodological difficulties when it comes to a definition that is specific to the site. This is due to lack of data and the absence of appropriately robust tools for calculating results tailored to the data quality and opportunities of the company. Work is currently being carried out on this.

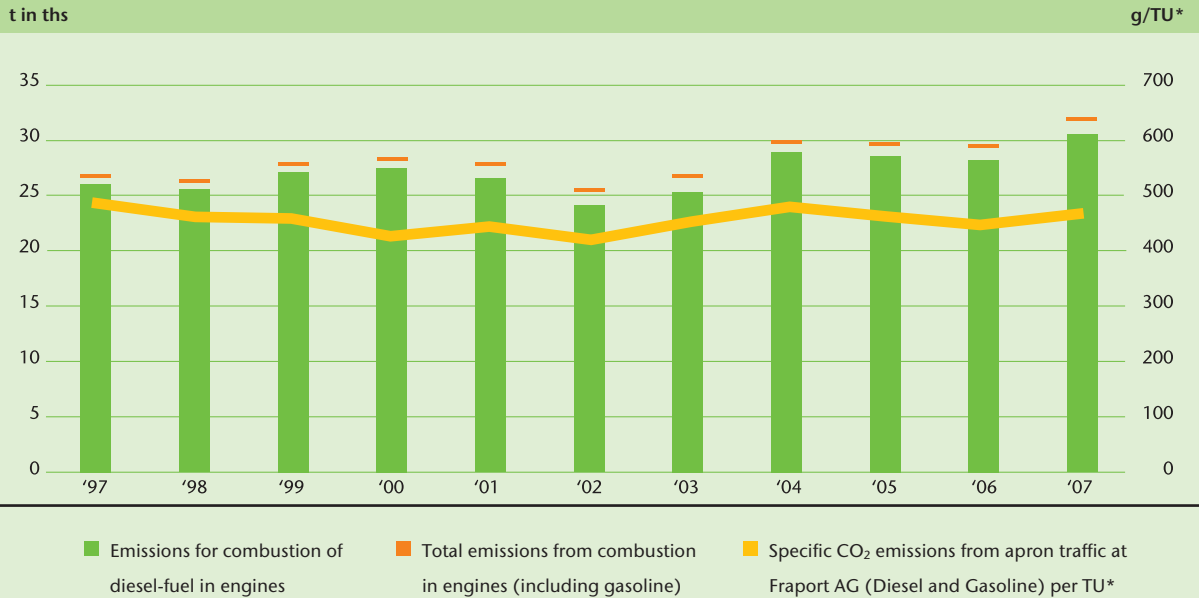
Fraport AG's greenhouse gas emissions

Emissions originating from the operation of Fraport AG's vehicles and mobile ground support equipment (Scope 1 GHG Protocol)

Fraport's vehicle fleet currently comprises approximately 3000 mobile ground support equipment and vehicles including cars. The main elements are handling equipment (engine tractors, container transporters, container elevators, forklifts, etc.), aircraft tow-trucks, supply and disposal vehicles, ground power units, buses for passenger transport, etc. A large number of small buses and private cars are also part of the equation. CO₂ emissions from Fraport AG's operation of vehicles and mobile ground support equipment are presented in the graph below. The data are based on the annual amount of fuel that the Fraport service station dispensed to these vehicles and equipment. This is mostly diesel fuel in line with the structure of the vehicle fleet. Approved emissions factors were used to convert the volume of fuel into carbon-dioxide emissions.

The graph shows that absolute emissions have increased slightly over the years, although slight fluctuations occur from one year to the next. This is roughly in line with the growth in demand for air transport, as shown in the trend for aircraft movements (see diagram in the Aircraft Noise chapter), and the similar increase in passenger numbers. Other contributory factors include the general traffic situation on the apron and service roads, and inevitable diversions entailed by the construction projects in the area of Terminals 1 and 2.

New growth in air traffic was generated at the end of 2003 after a period of slight decrease or stagnation in the years 2002 and 2003, mostly due to the worldwide decline in demand for air traffic after the terrorist attacks in the United States of America (September 2001) and the SARS crisis in South East Asia (first half of 2003). Accordingly, there was a rise in the demand for handling services at FRA and an increase in fuel consumption.

CO₂ emissions from the Fraport vehicles and mobile ground support equipment at the FRA site

By contrast, the effects of the traffic situation are evident when the specific indicator is analyzed. This compares CO₂ emissions caused by fuel consumption to the required handling service measured in traffic units (TU). This indicator was approximately 460 grams of CO₂ per traffic unit at the end of the 1990s. By the year 2002, this indicator had come down to approximately 420 grams of CO₂ per traffic unit owing to improved efficiency within the handling processes, but it rose again in the subsequent years. According to the ground traffic services, this effect can be ascribed to the hindrances provided by the numerous construction projects commenced during that period and that are still continuing. They resulted in the expenditure of considerable extra resources for the handling processes. The value is currently once again around 460 grams/TU.

Emissions from the operation of emergency power units (Scope 1 GHG Protocol)

Emergency power units are needed by Fraport AG to protect crucial installations and systems at the airport from electrical power outages. However, these facilities are rarely used due to the high level of supply certainty that our electricity suppliers have been able to guarantee during the past. Nevertheless, these facilities must be tested from time to time in order to confirm that the equipment is working properly.

The carbon-dioxide emissions are therefore mostly a result of burning the fuel to operate the emergency power units during the run-ups. The following figures provide the statistics for the years 2005–2007:

2005:	219 tons
2006:	406 tons
2007:	415 tons

* A "Traffic Unit" (TU) is equivalent to a passenger with baggage (excluding transit passengers, according to ADV and ACI) or 100 kg of cargo or mail.

Emissions from the operation of the fire fighter-training facility (Scope 1 GHG Protocol)

The airport fire department has for some years now run a state-of-the-art facility for aircraft fire simulations and for fire fighting training, operating on propane gas. Fire fighters are primarily trained for Fraport AG, although courses in fighting aircraft fires are also available for external fire services. The volume of carbon-dioxide emissions from this facility generated in the years 2000 to 2007 was approximately 190 to 360 tons depending on capacity utilization. Approximately 241 tons were emitted in 2007.

Emissions from energy acquisition (Scope 2 GHG Protocol)

Fraport AG consumes significant amounts of energy in the form of electricity, district heating, and district cooling. These forms of energy are produced and supplied by third-party utilities. Heat is now virtually nowhere generated from oil or gas-powered facilities at Fraport AG.

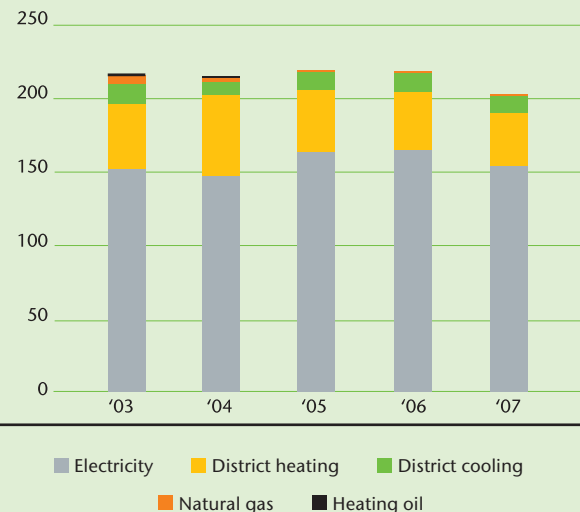
The carbon-dioxide emissions from the purchase of energy remained relatively constant at approximately 220,000 tons each year from the years 2003 to 2006. This value decreased to around 200,000 tons in the year 2007. The mild winters in 2006/2007 and 2007/2008 are partly responsible for this decrease since the demand for heat declined as a result of the very small number of days when frosty conditions were experienced.

The development of the specific indicator is even more welcome. A continuous decline in emissions arising from the energy expenditure per traffic unit has been recorded, from some 3.6 kg in 2003 to the current value of around 3.0 kg. This represents a decrease of almost 18 percent.

Energy efficiency still has significant potential as demonstrated by a pilot project carried out in 2007 to determine energetic values of current Fraport buildings. Additional information is provided in the Energy chapter.

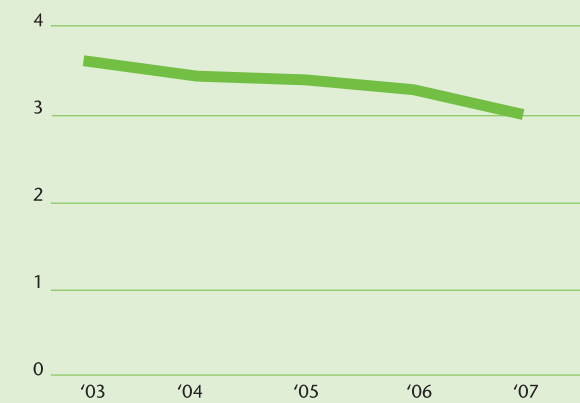
CO₂ emissions from energy carrier

t in tbs Consumed by Fraport AG



Specific CO₂ emissions from energy consumption

kg/TU* Consumed by Fraport AG



Emissions from air traffic (Scope 3 GHG Protocol)

According to calculations within the Zoning Plan procedure, carbon-dioxide emissions from the operation of aircraft amounted to approximately 729,000 tons for the year 2005. This includes emissions from approach, taxiing (idle), take-off, climb-out, auxiliary power units (APU), and engine run-ups. As in the case of conventional emissions registers, statistics on emissions were restricted to a height of 300 meters above the ground because the aim was to evaluate air pollution emissions that affect the immediate environment rather than a calculation of the global climate gas CO₂. Sensitivity analyses have revealed that emissions up to 300 m above the ground comprise nearly 90 percent of the ground level pollution. As a precaution, more in-depth surveys tracked aircraft movements up to 700 m above ground level in the expert reports on expansion and these included more than 99 percent of the pollution.

In the meantime, it has become common practice to use the specification of 3000 ft (approx. 900 m) above ground to plot airport emission inventories. These calculations indicate that carbon-dioxide emissions generated in the year 2007 amounted to approximately 952,000 tons, including carbon dioxide resulting from the operation of auxiliary power units (APU's). APU's contributed approximately 90,600 tons, and 284,000 tons were produced from aircraft simply taxiing on the ground.

Emissions from the arrival and departure of passengers (Scope 3 GHG Protocol)

Taking an average over the years indicates that almost half of all passengers at Frankfurt Airport are either arriving or departing passengers with their flight journey starting or ending in Frankfurt. Passengers arriving at the airport and departing from it have access to all means of transport. Statistical data describing the origin of these passengers and their chosen means of travel for the journey between their homes and the airport are regularly compiled and processed by the Fraport market research department. Further information on the modal split is provided in the Transportation chapter (intermodality). These figures have been used to create an approximate model for a traffic volume structure. Carbon-dioxide emissions were then calculated, at first restricted to the years 1998, 2002, and 2007 to facilitate an immediate overview. However, the model is at the development stage and will be gradually improved and refined over the coming years by linking it to a traffic model. The specified tonnages are therefore preliminary.

The following annual tonnages were derived from the calculations for the "arriving and departing passengers" segment:

1998:	approx. 400,000 tons CO ₂
2002:	approx. 347,000 tons CO ₂
2007:	approx. 324,000 tons CO ₂

The 20 percent decline is particularly striking in view of the fact that the percentage of "originating" passengers has increased by almost 14 percent (= 1.5 percent p.a.) from 22.3 million to 25.4 million during the same period of time. This marked improvement has mostly been the result of the development of the intermodal system, and especially the inauguration of the long distance railway station (May 1999) and the new high-speed rail track to Cologne (June 2002).

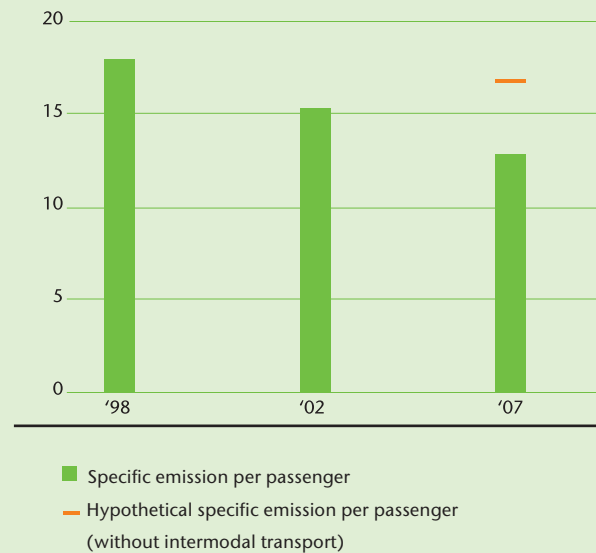
This effect is evident especially in an analysis of the specific CO₂ emissions. In 1998, emissions amounted to approximately 18 kg of CO₂ for originating passengers arriving or departing. In 2002, the amount of emissions decreased to around 15.3 kg and continued to fall to 13 kg in 2007. This decline has two causes. First and foremost, this period shows an increase of almost nine percentage -points in the volume of people using rail travel (1998: 25.5%, 2007: 34.3%). This represents an increase of 4.9 percent annually based on absolute passenger numbers. During the same period, improvements were made in the emissions factors for the modes of transportation used and these emissions declined by approximately 10 percent in the same time-frame.

The model was also used to analyze the “intermodal use”, defined in this case as the reduction of carbon-dioxide emissions as an outcome of using a low-carbon means of transport. In 2007, the figure amounted to some 4 kg of CO₂ for each arriving and departing passenger. If this figure is extrapolated to the overall number of passengers, this yields a projected saving of approximately 100,000 tons of CO₂.

However, this benefit only arises as a result of the interaction of several different players. Fraport AG operates in a system partnership with German Rail (Deutsche Bahn AG), the Rhine-Main suburban transport network (Rhein-Main-Verkehrsverbund, RMV), other public transit networks, and the airlines. The objective of Fraport AG is to contribute to the ongoing advancement of this intermodal benefit within the scope of its responsibility and options.

Intraplan based in Munich used a different model to create a projection of the intermodal effects by the year 2020, relating to carbon dioxide. The environmental model was established by BVU (Beratergruppe Verkehr + Umwelt GmbH, Freiburg im Breisgau) and it has been extensively applied nationally and internationally. In 2007, the model was adopted for German Transport Infrastructure Planning (Bundesverkehrswegeplanung) until 2025.

Relative CO₂ emissions from arrival and departure of pax
kg/Originating passenger (pax)



A traffic forecast for the year 2020 was launched on behalf of the Air Traffic for Germany Initiative (Initiative Luftverkehr für Deutschland) in 2007 (baseline year 2005). This forecast calculated the market impact of different intermodal planning scenarios for Germany nationwide, as well as individual hub and civilian airports. The planning scenarios relate to the new and expanded stretches carrying high-speed trains operated by German Rail (Deutsche Bahn AG, DB), the planned network for German Rail long-distance traffic (trains in 2020), and intermodal services (e.g. the AIRail service operated by Lufthansa). The impacts of intermodality in the market and on individuals relate to the modal split or the means of traffic used by travelers, and the expansion or reduction of airport catchment areas. Passengers use the latter to take their decision on a specific departure airport, if these effects are due to massive cuts in travel time by rail. The importance of transport effects is expressed in terms of “amount” and as the ratio of transport service to person kilometers.

If the intermodality measures go according to plan, the following effects will be exerted on CO₂ levels at Frankfurt Airport:

- Development of high-speed transit systems by German Rail (Deutsche Bahn AG, DB) causes a shift in traffic from air traffic and from private transport to rail. If 2020 is taken as the point of reference, this results in an annual reduction in CO₂ amounting to approximately 85,400 tons, since the specific emission values vary according to different means of transport. The transfer of private traffic to rail at Frankfurt Airport is rather low as the catchment areas for the two forms of transport are structured differently and there is little competition in regional traffic (up to 100 km traveling distance to the airport).
- Two markets play a significant role in the transfer from air to rail. Firstly, competition between the two means of transport is generated in national point-to-point traffic and this accounts for almost 40 percent of the CO₂ reduction. Secondly, the two carriers cooperate with one another to transport passengers to the airport and transfer them. Around 60 percent of the CO₂ reduction resulting from the modal split is saved by conveying passengers to the airport by train rather than air.
- In addition, some 90,000 tons more of CO₂ are saved each year as a result of changes in the airport catchment areas, so that total CO₂ emissions for the FRA site may be reduced (effects of modal split and catchment area) by nearly 175,000 tons each year.

Intermodality initially has the effect of expanding the catchment area FRA and thereby increasing CO₂ emissions. Competition between airports also plays a role. However, the decline in catchment area of other airports, including those in neighboring countries, offsets this effect. The significant overall reduction in CO₂ demonstrates that enhanced efficiency can be achieved with travel to and from airports by selecting a different travel chain or departure airport. This is generally also the case for travel chains which cross borders.

***Emissions caused by Fraport employees traveling to and from work
(Scope 3 GHG Protocol)***

Representative surveys have generated relatively good data on the transport choices made by Fraport employees in their daily commute to work. In 2007, the modal split was around 33.2 percent. This reveals that approximately one third of Fraport employees use public transportation and the remaining two thirds travel by private car. A distribution of Fraport employees was derived from anonymous data provided by Human Resources about employees' towns of origin located in zones at different distances from the airport. A matrix plotting the means of transport and distance was created by analyzing this data, and the distance traveled over the course of the year was estimated. The associated CO₂ emissions were calculated from this matrix using standardized emissions factors, and the emissions were differentiated by means of transport and zone.

Calculations were first carried out for 2006 and they were subsequently continued in the year 2007. The CO₂ emissions generated by this segment in 2006 amounted to approximately 23,400 tons and 22,300 tons for the following year. Around 79 percent of these emissions are caused by private vehicles, while the remaining 21 percent were generated by the use of public transport. The "intermodal benefit" generated by the use of public transport amounted to some 6,300 tons of CO₂ that were avoided.

This remains a working model and needs to be developed and refined over the next few years by linking it with a traffic model. The specified tonnages are therefore provisional.

Emissions caused by Fraport employees on business trips (Scope 3 GHG Protocol)

Carbon-dioxide emissions from Fraport employees on business trips have been reported since 2006. Trips by plane, train, and private car are included in these calculations. Fraport calculates the data for trips by plane and car using standard emissions factors. German Rail (Deutsche Bahn AG, DB) kindly provided data on emissions from train journeys.

In 2006, business trips produced approximately 986 tons of CO₂ emissions, while some 900 tons were reported for the year 2007. In line with other global corporations, air travel was the biggest contributor to CO₂ emissions from employee business trips. Around 60 percent of these emissions were caused by trips to subsidiaries and shareholdings abroad, and trips associated with international business expansion. The reduction is due partly to the change in business travel policy instituted in 2007.

Mitigation measures

The breakdown according to Scopes outlined above is a reflection of the responsibility that is to be attributed for the associated greenhouse gases, and it also demonstrates the extent to which Fraport AG is able to influence generation of these gases. The company is in a position to significantly influence emissions from Scopes 1 and 2, while influence on emissions from Scope 3 is only indirect and difficult to implement. Any planning measures are also dependent on the availability of appropriate technology and the need to meet contractually defined customer service qualities. This precludes any experiments with uncertain perspectives. At most, a reduction in specific emissions is anticipated given the predicted growth in demand for air traffic during the upcoming years. Encouraging indicators and examples are also emerging that point to a potential reduction in absolute CO₂ emissions in several segments.

In the context of a company-wide research project, the potential for reducing carbon dioxide was analyzed and evaluated. The results yield options for the reduction of CO₂ emissions, for example:

- in conjunction with the continuous optimization of ground handling processes;
- in conjunction with the reduction of aircraft taxiing and waiting times;
- through optimization of energy efficiency in existing buildings and facilities;
- by using energy produced from low-carbon or carbon-neutral sources;
- by stabilization and expansion of intermodal links at the airport.

Several of these options are also discussed in the Air Pollution chapter.

More efficient planning helps to avoid empty runs in ground handling processes and leads to improved resource efficiency. A great deal of attention has already been devoted to planning in the past and the IT systems supporting these procedures have been continuously upgraded. The new Airport System for Transport and Operations (ASTRO) is gradually replacing the old systems, and savings of around 500 tons of CO₂ are projected for each year.

Carbon-dioxide emissions will be further reduced by expanding the stationary ground power supply. This will enable mobile diesel ground power units to be eliminated at these aircraft parking positions. Modified procurement in this segment will enhance this effect. By comparison with older equipment, recently purchased ground power units are also distinguished by a significant reduction in the size of the motor, and output control based on demand. These measures have cut CO₂ emissions in half since 2005, despite the fact that operating times have increased. Specific emissions have been reduced from around 50 kg CO₂ for each hour of operation to 24 kg. Absolute emissions came down from 6,600 tons to approximately 4,080 tons.

Experts at Fraport are predicting a further potential for reducing CO₂ in the area of aircraft taxiing movements. Taxiing and waiting times are often a result of high capacity usage throughout the system and these could be avoided if capacity was matched with demand. The introduction of Departure Management – within the Airport Collaborative Decision Making System (A-CDM) – should increasingly deliver benefits on this front. The system could reduce CO₂ by 14,200 tons on the basis of a realistic assumption that waiting times could be reduced by at least 1 minute for each aircraft movement.

Potential scenarios for CO₂ reduction in buildings and facilities at Fraport AG have not been definitively calculated yet within the scope of the project described above, although the outlook is promising. The current measures and the measures planned in the program of building refurbishment are estimated to save around 13,000 tons of CO₂ each year.

A large share of Fraport AG's CO₂ emissions can be saved by using energy that was produced from low-carbon or carbon-neutral sources. As elucidated above, the CO₂ equivalent of the energy sources used in 2007 was approximately 200,000 tons, with approximately three quarters originating from electricity consumed by Fraport.

The Executive Board decided to buy certified green electricity to meet the entire anticipated demand for electricity at Fraport AG for the years 2008 to 2013, and this will result in a significant reduction in CO₂ emissions. It is projected to reduce emissions by up to 171,000 tons a year during 2008 and 2009, and a by some 200,000 tons a year for the subsequent years. According to the latest research, this is equivalent to around two thirds of the carbon-dioxide emissions caused by Fraport or for which the company is responsible (Scope 1 and 2 GHG Protocol). District cooling supplied to Fraport will also be generated by green electricity in the years 2008 and 2009. This will lead to a further absolute reduction in CO₂ emissions of around 14,000 tons of CO₂ each year. It is not currently possible to purchase appropriate certificates beyond the year 2013.

Insourcing companies at the airport location will also be offered certified green electricity from the year 2010. Certificates amounting to around 50 percent of the anticipated volume of electricity will be procured. This measure has the potential to reduce CO₂ emissions at the airport by a further 70,000 tons a year.

Measures that stabilize and improve the intermodal connections at the airport also make substantial contributions to CO₂ reduction. Major factors in the ongoing development are detailed in the Transportation chapter, although an assessment of the associated CO₂ reduction would be premature at the present time. The existing rail connection in the CargoCity South area is currently being reinstated and this represents a further measure to improve intermodality. The aim is to transport freight by train rather than truck between Frankfurt and Leipzig. Preliminary assessments of the effect on climate protection show that this would result in roughly 1,500 tons of CO₂ being saved each year.

Air quality *(emissions and pollutant concentrations)*

Sustainable measures to control air pollution and reduce emissions

At Frankfurt Airport, carbon monoxide and nitrogen oxides make up the largest part of the airport's total emissions among the locally effective forms of gas and dust. Hydrocarbons, sulfur dioxide, PM 10 (fine dust particles with a diameter of less than 10µm), soot, and benzo(a)pyrene [B(a)P] are next in line.

Air traffic is the main source of emissions at the airport. Vehicles on the apron and traffic on the roads in and around the airport constitute the second largest source of emissions. The proportion contributed by stationary sources, such as heating systems and GPU's, is low by contrast since most buildings are connected to the district-heating network.

Recording emissions

In order to record development of emissions continuously, data for annual emissions are derived from routinely collected operational data by comparable calculation bases. An equivalent procedure has already been developed for aircraft and the procedure is described in the Environmental Statement 2005.

The system for recording emissions from the various ground handling processes and vehicle traffic is especially complex and is in the process of being developed.

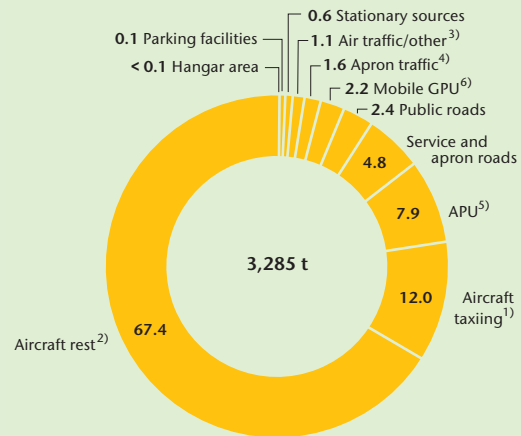
Comparison of emissions in the various processes

The latest report on all the source groups based on comprehensive surveys is available for the year 2005. The following graphs show the distribution of the most important pollutants subject to emission limits: nitrogen oxides, benzene, and PM10.

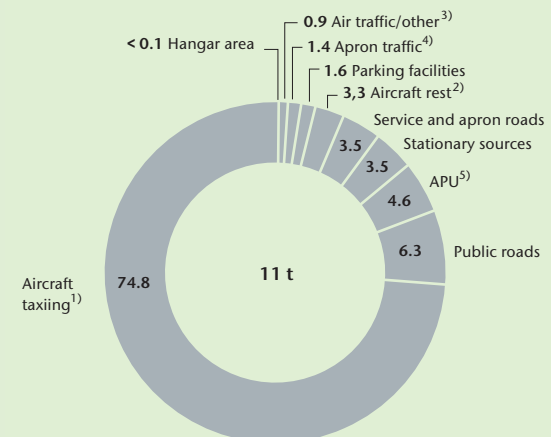
The biggest contribution for all three components comes from aircraft engines. Nitrogen oxides mostly occur in the stages when loads are greatest during take-off, climb-out, and descent. The proportion arising from taxiing movements on the ground is much lower, although this remains the next most significant process.

Distribution of emissions of various airport sources

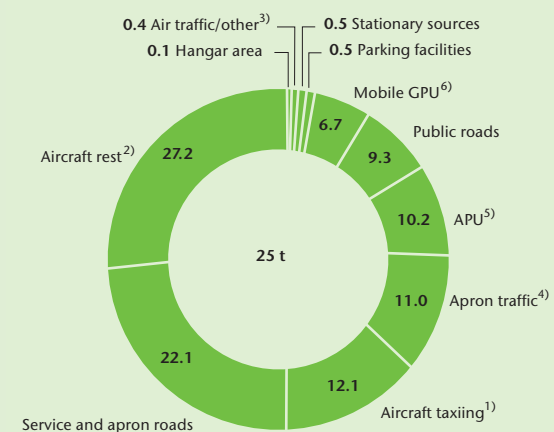
NO_x emissions 2005 in % Basis: Frankfurt Airport



Benzene emissions 2005 in % Basis: Frankfurt Airport



PM10 emissions 2005 in % Basis: Frankfurt Airport



¹⁾ Ground

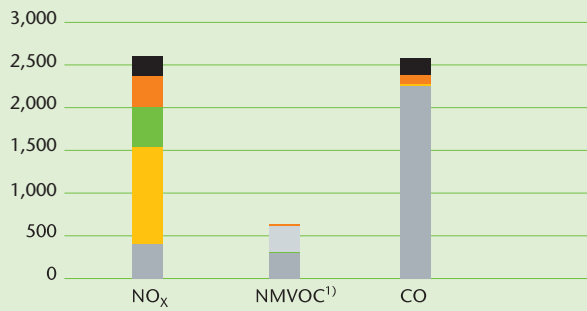
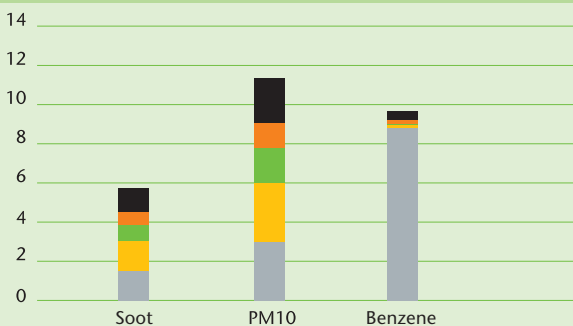
²⁾ to 300m

³⁾ Engine run-ups, test runs

⁴⁾ Handling

⁵⁾ Auxiliary power unit

⁶⁾ Ground power unit

Air pollution emissions caused by aircraft traffic in 2007**in t/a Basis: up to 300 m above the ground at the FRA site**¹⁾ Non-methane volatile organic compounds.**in t/a**

Taxiing Descent incl. roll-out
 Take-off Engine ignition
 Climb-out APU (Auxiliary power units)

The data for benzene can be transferred to toluene and xylene since they are derived from the same sources.

Air traffic emissions at FRA**Basis: up to 914 m above the ground in t/a 2007**

NO _x	4,227
SO ₂	242
VOC (HC) ¹⁾	633

¹⁾ Engine gases do not contain NH₃, VOC (volatile organic compounds) refers to HC (hydrocarbons).

This trend is reversed for benzene, which is generally emitted during partial combustion when engines are not subject to full loading. For both components, significant contributions are also made in the course of APU operation (auxiliary power units in the aircraft used to supply aircraft with electricity when they are on the ground), handling processes, and vehicle traffic. In contrast, PM10 emissions are evenly dispersed over the source groups.

However, the emissions data taken in isolation only permit limited conclusions to be drawn on the significance of a source group for air quality. The spatial dispersal (in particular the altitude of emissions), the climatic conditions, and the influence of other sources play a significant role here. Model calculations demonstrate that the nitrogen oxides are most relevant for the airport as a local polluter. All the other pollutants are less important contributors to airport-based pollution. This applies to PM10 in particular. The background pollution over a wide area represents a multiple of the contribution made by aircraft emissions and therefore also defines the level of pollution in the vicinity of the airport due to its exceptionally favorable ventilation conditions.

Current air traffic emissions

The taxiing on the apron and taxiways is the only phase of the various flight phases which the airport operator is able to influence. A comparison of the aircraft movement phases from the year 2007 shows the current proportion of emissions derived from taxiing. Since these emissions are released close to the ground, mitigation measures can exert a greater impact on local air quality than would be the case for emissions released at greater heights.

The activities associated with emissions inventories have increased dramatically over recent years and this has been associated with an increased need for availability of comparative emissions data. Frequently, the conventional reference elevation for air traffic is 3,000 feet (914 meters, the altitude of the ICAO standard LTO cycle). Emissions at this altitude are also provided for purposes of comparison.

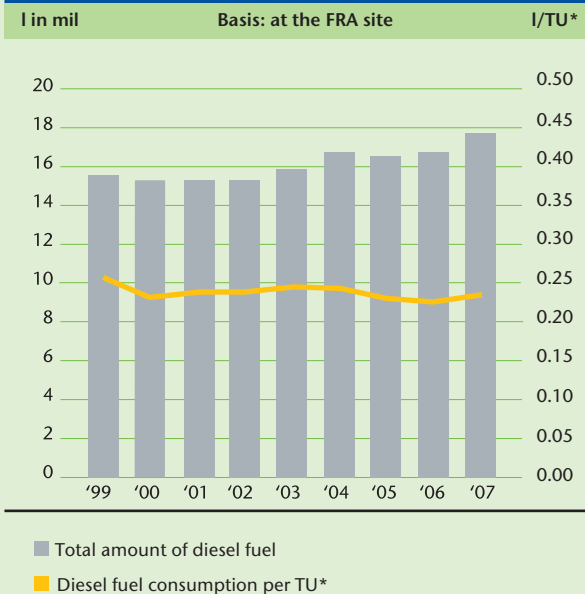
Current apron traffic emissions

The apron traffic with vehicles, mobile ground support equipment, and handling equipment is directly influenced by technological and organizational measures. These measures also impact on Fraport's service roads. Fraport is additionally in a position to indirectly influence vehicles, machinery, and equipment operated by other companies at Frankfurt Airport. The emissions are produced at low altitudes and it is not yet possible to provide regular documentation. However, an approximation can be provided for the ongoing development on the basis of the well-documented timeline for analyzing consumption of diesel fuel at FRA. Whereas CO₂ emissions are directly proportional to fuel consumption, the pollutants impacting local air quality are highly dependent on the operating conditions of the vehicle or equipment, and the performance or the length of time they are in use. This means that these emissions cannot be quantified solely on the basis of fuel consumption. However, a rule-of-thumb approach is that emission factors and fuel efficiency improve in more advanced and up-to-date vehicles, while fuel consumption rises as a function of any increase in performance. The conclusion is that fuel consumption can be taken as an indirect indicator of the emissions generated on the apron.

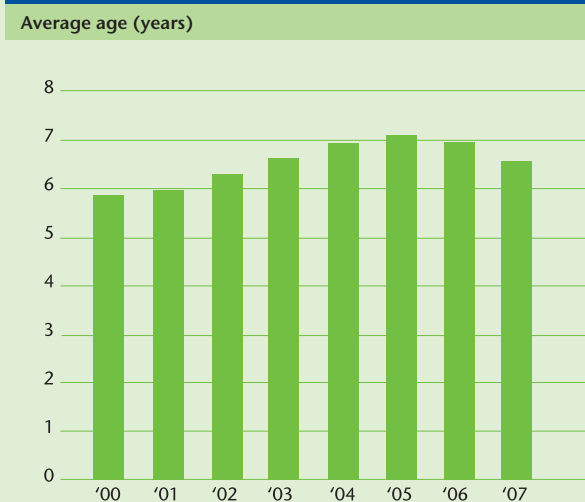
The intermittent rise in fuel consumption is partly due to the greater traffic volumes. Another major contributory factor is the increase in construction activity at the airport in 2007. This entails diversions particularly in the apron area. Consumption based on traffic unit is stagnating with only minor variations.

The average age of the vehicle fleet, excluding vehicles leased for a period of one year only, has dropped since 2005 due to the increased rate at which mobile work machines, ground support equipment, and vehicles are being replaced by newer and more up-to-date versions, not least in order to comply with EU directives. Emission factors have improved for individual items of equipment generating pollutants in the local environment. It is therefore a reasonable expectation that the level of specific local pollutants will have declined.

Total amount of diesel fuel (Fraport, Lufthansa, and others)



Age of Fraport vehicle fleet¹⁾



¹⁾ Not including cars leased for one year only

* A "Traffic Unit" (TU) is equivalent to a passenger with baggage (excluding transit passengers, according to ADV and ACI) or 100 kg of cargo or mail.

Percentage of emissions produced by the airport in the survey area in the lower valley of the River Main in 2000

	NO _x	CO	Soot	NMVOC ¹⁾	Benzene
Percentage of total vehicle traffic and stationary sources of emissions at and around the airport	2%	1%	5%	4%	2%
Percentage of total aircraft emissions up to 300 m above the ground, incl. backup generators, run-ups and static tests	13%	6%	3%	10%	6%

¹⁾ Non-Methane Volatile Organic Compounds

Comparison of airport and regional emissions

The emissions register drawn up by the Hessian Agency for the Environment and Geology (HLUG) is used to compare the volume of emissions produced at the airport and the surrounding region. The emissions register for the year 2000 was used in the Environmental Statement 2005. This remains the most up to date register (June 2008) and will continue to be used as a point of reference for the emissions in the surrounding region.

Emissions registers record emissions up to a height of 300 m above ground level in conformity with the 5th Administrative Provision on the Federal Impacts Control Act. Emissions up to this altitude are the main contributors to air pollution near the ground. This reference level was adopted for recording emissions from the airport.

As shown in the Environmental Statement 2005, the emissions produced by the airport are very low by comparison with the survey area in the lower valley of the River Main. The percentage of vehicle traffic and stationary sources at and near the airport is significantly lower than that of air traffic.

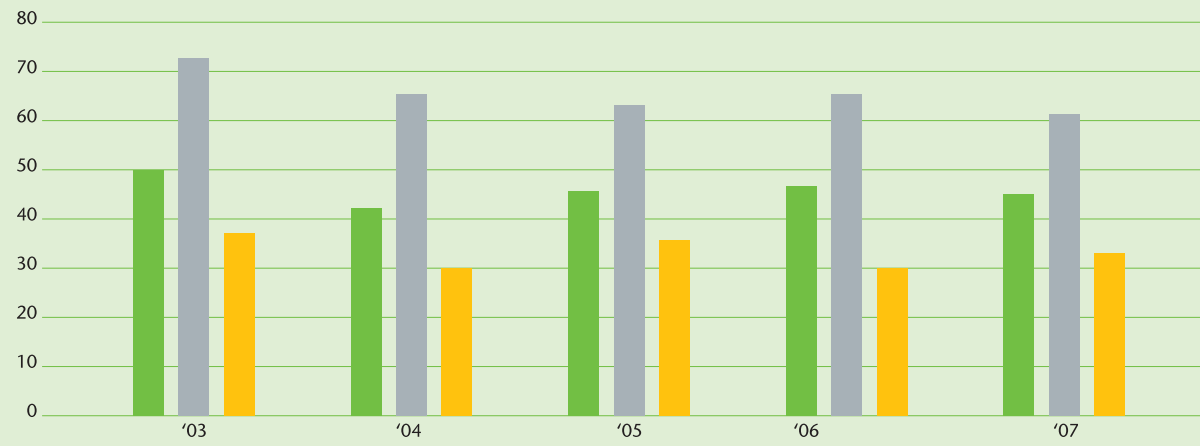
Air quality around the airport

A comparison of the air quality at the airport with air quality in the region involves analyzing the levels of air-pollution elements referred to above – NO₂ (as the share of NO_x relevant to pollution), benzene, and PM10 fine dust (mass of all particles included in dust where the aerodynamic diameter of the particles is less than 10 µm). The pollution measurements recorded at the airport on a regular basis are compared with the results from two monitoring stations in the monitoring network operated by the Hessian Agency for the Environment and Geology (HLUG). These stations are located at Friedberger Landstraße in Frankfurt, and Wiesbaden South. Whereas the Frankfurt monitoring station is situated in an area with high traffic volumes, the data gathered from the Wiesbaden station reveals a less exposed site, although values for benzene are still recorded.

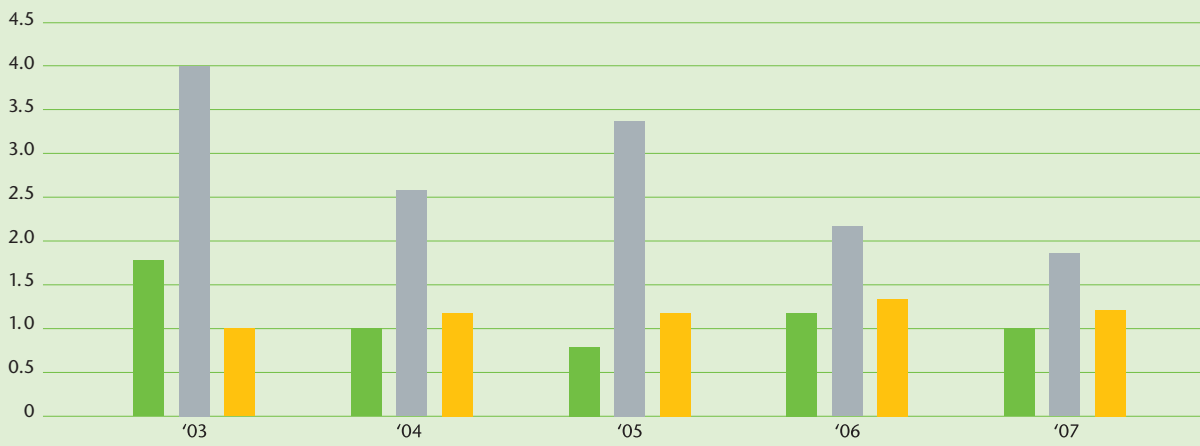
The values for all components are highest at the high traffic-density Frankfurt location. The results gathered from the airport monitoring station are considerably lower, although they remain slightly higher than the data taken at the Wiesbaden station. In line with expectations, the smallest difference is exhibited between the PM10 values at the three sites, while Friedberger Landstraße still has the highest values for PM10. The measurements taken at the airport are below the reference values from the 22nd Ordinance on the Implementation of the Federal Impacts Control Act (22. Bundesimmissionsschutzverordnung), which is not binding on the airport site itself and in the immediate non-residential surroundings, but is used for additional reference purposes. However, the benchmark value has almost been reached here on account of the annual decrease in the NO₂ tolerance margin. This is only 25 percent for benzene, while PM10 has been between 63 and 73 percent of the benchmark value for the past five years.

Comparison of the yearly average emission of pollutants (immissions)

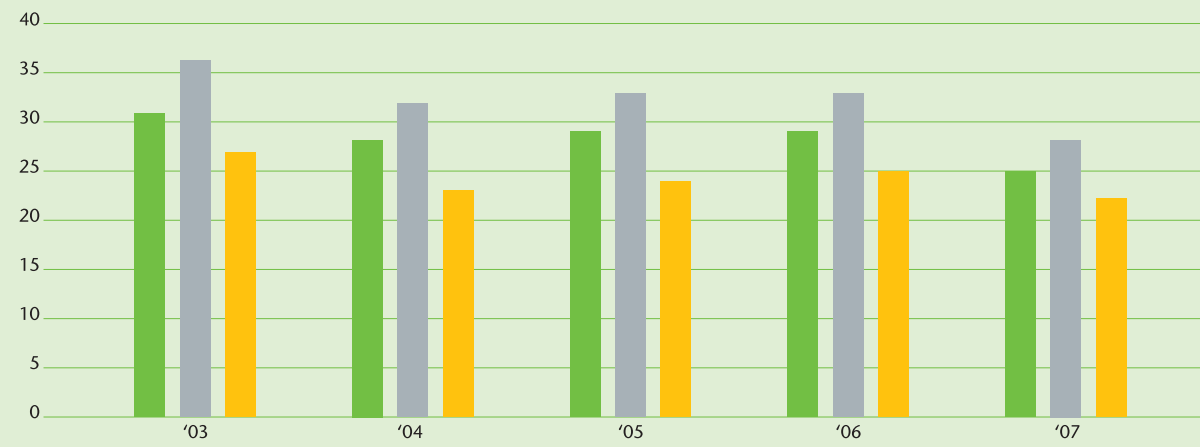
NO₂ in µg/m³



Benzene in µg/m³



PM10 in µg/m³



- FRA SOMMI 1 (Self Operated Measuring and Monitoring Installation, Fraport)
- Frankfurt, Friedberger Landstraße (HLUG)
- Wiesbaden-South (HLUG)

Measures for emissions reduction

The measures described above are also appropriate for climate protection.

The following technical and organizational measures are the main ones that are effective at local level:

- Upgrading mobile ground support equipment in conformity with the 2004/26/EC directive and the latest exhaust standards. In 2007 alone, Fraport purchased 193 mobile ground support vehicles. The rate of exchange is approximately 17 percent if the overall increase in the number of vehicles is taken into account.
- Optimization of ground handling processes (avoidance of empty runs) by developing and deploying new software tools (Plandis project). TESS (Transport Deployment and Control System) will be replaced by the more efficient ASTRO (Airport System for Transport and Operations) to control traffic flow on the apron. A prototype for baggage handling was already delivered in January 2007.

The DMAN-FRA (Departure Management) software tool is gradually being implemented in A-CDM (Airport Collaborative Decision Making) to reduce the taxiing and waiting periods experienced by aircraft before take-off. This innovation saves at least one minute. The following amounts are saved for each minute of taxiing on the basis of values for the year 2007:

NO _x :	20 tons
Benzene:	0.43 tons
PM10:	0.16 tons

- A reduced use of the diesel-powered ground power units (GPU) for supplying aircraft with electricity is achieved by equipping all aircraft parking positions with 400-Hertz ground power supplies. 112 positions have already been equipped. It was thereby possible to reduce the run-time of the aircraft's auxiliary power units (APU) and the deployment of diesel-powered ground power units.

- New airport charges based on NO_x and HC emissions were introduced in 2008. The landing and take-off charges based on weight were significantly reduced with the aim of introducing a charge for each aircraft movement based on NO_x emissions instead. This charge and the noise-related charge component account for 30 percent of the airport charges for each aircraft movement, which means that this proportion of the charges is based on environmental factors. Approximately € 3.00 is charged for each kilogram of nitrogen oxide equivalents (= emissions value) of the standardized landing and take-off cycle (LTO cycle) for aircraft. The necessary data on aircraft and engine types are determined using an accredited fleet database. The ERLIG-1 formula is used to calculate emissions values on the basis of the certified nitrogen oxide and hydrocarbon emissions for each engine in the LTO cycle, in conformity with ICAO regulations Annex 16, Volume II. The emission values are calculated using the ICAO Database for Turbofan and Jet Engines 2 and the Database of the FOI Swedish Defense Research Agency for Turboprop Engines 3.

- A pioneering project for the apron vehicle fleet is the use of vehicles powered by hydrogen fuel cells as part of the European pilot project entitled "Zero Regio". Three vehicles are currently in operation and the test data collected from this project are being analyzed.

The baseline for the issues of climate gases and air quality is the initial situation for traffic and energy, alongside data on air traffic.

Transportation

Frankfurt Airport – intermodal traffic hub

Frankfurt Airport is increasingly evolving into an intermodal hub in line with the overall strategic goals set out in the corporate vision of Fraport AG. Approximately 53 percent of passengers are transfer passengers, and the others are originating passengers either arriving or departing by car or on public transport. This amounted to a total of some 26 million originating passengers last year. In future, these passengers should still be able to transfer seamlessly from rail to air in order to reap the benefits of the two transportation systems. Fraport AG continues to regard intermodal transportation as a strategic option that has great innovative potential for corporate development and environmental protection in the future.

The hub airport has a regional and a long-distance train station. This provides it with the world's best link between airport and rail network, with the long-distance rail network being a particular advantage. The benefits of intermodality have meant that the percentage of passengers using local public transport continues to remain at a relatively high level, and has proved capable of being raised further. In 2007, approximately 34 percent of passengers arrived at the airport by public transport and then left the airport in the same way (high-speed trains [ICE], long distance trains, regional trains, metropolitan railway [S-Bahn], buses). 17 percent of passengers used ICE trains (InterCity Express). This means that approximately 12,500 passengers use 175 long-distance trains and 7,000 passengers use the 218 daily metropolitan

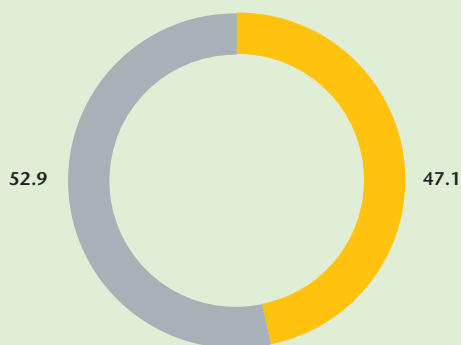
railway (S-Bahn) and regional connections to and from the airport each day. In the year 2007, over 4.5 million passengers traveled via the long-distance station and more than 2.5 million traveled via the regional station. This positive trend will continue over the long term as the options available improve, particularly in the case of high-speed rail travel. New routes are being planned with the emphasis on access to Frankfurt Airport, and the range of long-distance routes available is gradually being extended with additional routes, including routes across international borders (at FRA: the number of long-distance trains is up by +6.1 percent compared with the previous year, while the number of metropolitan railway connections is up by +4.1 percent). Development of existing intermodal products – the AIRail terminal at the airport and the Lufthansa AIRail service – is continuing. German Rail marketing tools, code sharing between German Rail and individual airlines or Interlining/Global Distribution Systems with AccesRail are also being launched in the marketplace.

Transfer to rail

The excellent rail connections at Frankfurt Airport create an outstanding foundation for boosting the use of public transport. They also allow journeys taken by very short flights to be transferred to rail travel. These measures will reduce future emissions of the greenhouse gas CO₂ in conformity with the transport goals of the EU. Improvements in the high-speed rail network have resulted in a shift in the modal split for passengers toward public transport.

Transfer and originating passengers

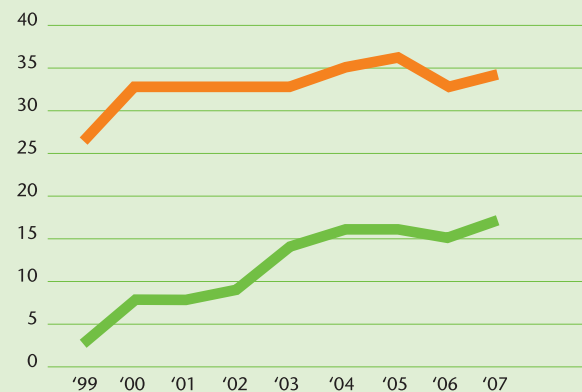
in %



■ Transfer passengers ■ Originating passengers

Percentage of passengers using public transport

in %



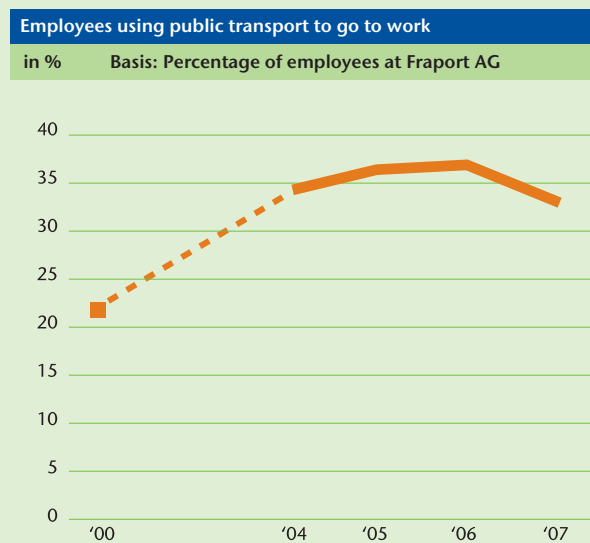
■ Public transport (incl. ICE) ■ InterCity Express (ICE)

Job Ticket and Carpool Club protect the environment

Fraport AG is dedicated to promoting improvements in the modal split not just for passengers, but also for the company's employees. A corporate objective is to achieve big reductions in air pollution by shifting people traveling by road in private vehicles to rail travel. This move will improve air quality in the region around the airport.

The company (without subsidiaries) has approximately 12,500 employees at Frankfurt Airport and offers them a free pass, known as a Job Ticket. In 2007, some 7,090 Fraport employees took advantage of the Job Ticket. This ticket is subsidized each month by Fraport AG and allows employees to use local public transport free of charge.

Fraport carries out annual surveys of employees to identify the choices they make for traveling to work. Until 2006, there had been an increase in the use of public transport to 36.6 percent. The proportion declined to 33.2 percent for Fraport in 2007. An assessment of the related climatic effects is provided in the Climate Protection chapter. On-site surveys are also carried out to establish the choices made on transport by all 70,000 employees at the airport. In 2005, the proportion traveling on public transport was 38.6 percent. The same value as 2005 was used for 2006 on the assumption that no major changes would have occurred during this time. In 2007, 37.8 percent of employees used public transport.



CARRIVA Carpool Club intended to reduce travel in private vehicles

The CARRIVA Carpool Club was founded at the beginning of 2008 in a venture supported by Fraport and Lufthansa. This is being promoted as an innovative product at the FRA site. The advanced system used in CARRIVA facilitates mediation of changing carpools. Offers and requests for carpool rides are registered with the computer system by cellphone and then coordinated within a matter of seconds. Passengers pay 10 euro-cents for each kilometer traveled, with drivers receiving 7.5 euro-cents. The difference goes to defray the costs of running the Carpool Club. The potential pool of 70,000 employees at the site ought to yield the critical mass of approximately 2,000 drivers and 2,000 passengers.

Shifting freight to rail

Truck traffic is expanding as airfreight volumes increase. Environmentally friendly measures can be deployed not only for passengers, but also for domestic freight traffic within Germany. Reinstatement of the rail connection to the CargoCity South area is an initial measure for transferring truck traffic between Frankfurt Airport and Leipzig to the rail network.

Fraport AG has joined forces with partners Lufthansa Cargo, Panalpina, and the Association of Freight-forwarders and Logistics for Hesse/Rhineland-Palatinate to launch a research project on the development and operation of an airfreight and rail center at Frankfurt Airport. The Fraunhofer Institute for Material Flow and Logistics will be carrying out research over the next three years to establish whether transferring airfreight traffic to rail is feasible and how it might be implemented.

The planned "AirCargo RailCenter" in CargoCity South is to be operated as a neutral handling facility and made available to all companies in the airfreight industry.

Energy

Airport supply

The main form of energy at the airport is electricity. District cooling and heating are also used. District cooling is deployed especially for keeping the two terminals air-conditioned.

All the technical facilities and equipment at Frankfurt Airport are supplied with electricity by an independent Fraport subsidiary company, Energy Air. Downstream power generators Mainova and Süwag supply energy to Energy Air. Electricity consumption at the airport is measured by more than 5,500 electricity meters.

The energy suppliers have the following mix:

in %	Süwag	Mainova
Renewable energy sources ¹⁾	15	19
Nuclear energy	26	21
Fossil fuels and other energy sources ²⁾	59	60

¹⁾ e.g. hydropower, wind power, solar energy

²⁾ e.g. coal, lignite, natural gas

Source: Fuel mix disclosure Süwag, Mainova AG 2006

Starting in 2008, Fraport AG (approx. 50 percent of consumption at the airport) will be supplied with 100 percent of its electricity needs from renewable sources, in this case from hydropower, through Fraport subsidiary Energy Air.

Frankfurt Airport is supplied with district heating through a twin pipeline 8.5 km in length. This is laid in concrete channels from the combined heating power station operated by Mainova AG in Frankfurt-Niederrad. The supply of hot heating water for heating buildings, generating hot water, and air-conditioning in existing and future buildings on the Frankfurt site is carried out at 8 transfer stations. The district heating network has a total length of 23 km.

Heating oil has become less important as an energy source following the demolition of the buildings on the former US Air Base. The new buildings constructed in the south are supplied with heating energy from natural gas through a local heating network from the boiler house located in the south or via a gas pipeline. The gas-fired district heating power station is operated by Mainova and is therefore attributed as district heating.

Cooling is also supplied through pipelines from a district cooling plant and local refrigeration facilities/chillers. Terminals 1 and 2, and a number of smaller buildings, are supplied with cold water for air-conditioning from a heating and cooling plant. Natural gas and electricity are the energy sources used to create the chilled water.

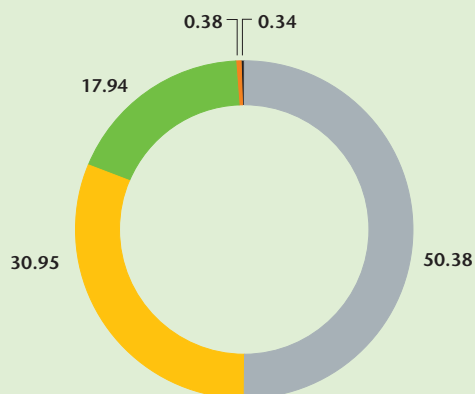
Declining energy consumption

In 2007, total energy consumption at Frankfurt airport was approximately 1,034 million kilowatt hours. The energy consumption can be compared with a town of approximately 100,000 inhabitants, with more than 145,000 passengers passing through each day, in excess of 5,700 tons of freight being handled, and approximately 70,000 employees.

While the demand for energy tended to increase in the past, energy consumption has declined by some five percent since 2004. In 2007, Fraport AG's total energy consumption was approximately 567 million kilowatt hours. A significant decline totaling almost 13 percent has also been recorded here during the past four years. The main energy sources are electricity at slightly above 50 percent, as well as district cooling and district heating.

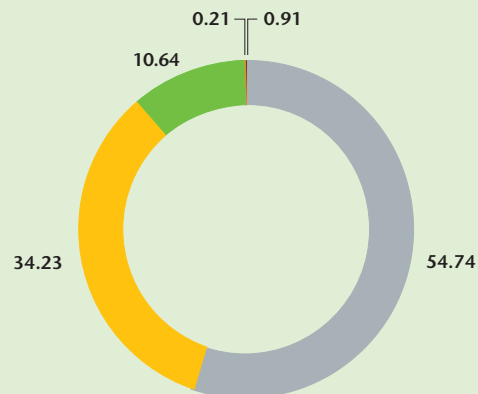
Energy carrier Fraport AG

in %



Energy carrier at Frankfurt Airport

in %

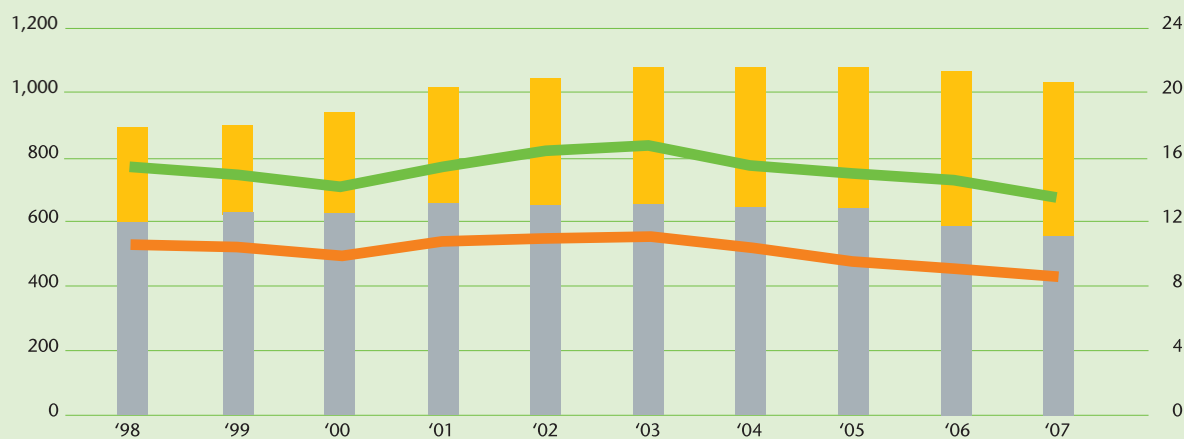


Electricity District heating District cooling Natural gas Heating oil

Total energy consumption at the airport (Fraport AG and third parties)

kWh in mil

kWh/TU*



Fraport AG: Total energy consumption Total energy consumption per TU* Third parties at the airport: Total energy consumption
Fraport AG and third parties at the airport: Total energy consumption per TU*

* A "Traffic Unit" (TU) is equivalent to a passenger with baggage (excluding transit passengers, according to ADV and ACI) or 100 kg of cargo or mail.

Energy efficiency further improved

Energy efficiency at the airport has continually improved over recent years and this trajectory of improved energy efficiency must continue with the greater volumes of passengers projected for the future. While the energy consumption per traffic unit was approximately 16.8 kWh/TU in 2003; this was decreased to 13.7 kWh/TU in 2007.

Measures reduce energy consumption

Fraport AG is a service company and real-estate operator, and energy is therefore mainly consumed in buildings. The lion's share of the energy is consumed at the terminals, but total energy consumption also includes the energy consumed in the numerous smaller buildings. The buildings operated by Fraport AG vary considerably in terms of age and characteristics of use, and the energy consumption differs accordingly.

A pilot project within the "Updating and Replacement of the Technical Control Centers" project was launched to determine the potential effects of measures directed toward saving energy. The aim was to make further improvements in energy efficiency. The first stage in the project was to review the feasibility of this project in Terminal 1 and record the outcome in a list of measures. The first downstream measure has already been commenced in the Central Ventilation Station 4 within the scope of the upgrading measures to improve efficiency. This will save approximately 1,800 MWh each year. The Central Ventilation Station 18/30 is to be upgraded between the years 2008 and 2011, saving somewhere above 6,600 MWh each year. The solutions for these central ventilation stations are effectively a solution to optimize energy consumption.

The project "Building Optimization for Energy Efficiency" was launched in 2007 and the aim of this project is to provide a detailed analysis of the specific energy efficiency in

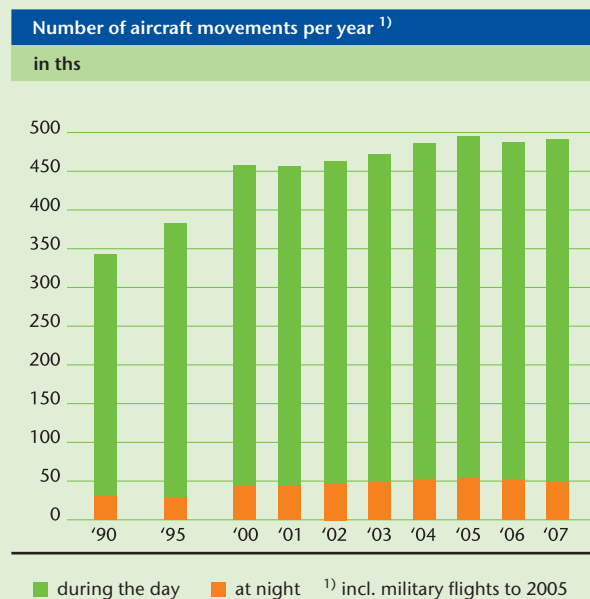
non-terminal areas. The project will initially review three office and workshop buildings of varying ages. The total potential for saving energy and reducing CO₂ as a result of the proposed measures is approximately 850 to 4,000 MWh each year, or 124 to 1,350 tons of CO₂ each year. There are further plans to implement these measures and extend this type of analysis to other buildings.

In future, Fraport AG intends to continue to focus on the use of renewable energy. The entire electricity supply to Fraport AG in 2008 is generated solely from hydropower. However, research studies looking at other possibilities have already been started. One project is carrying out a study to investigate whether part of the airport can be supplied with geothermal energy. Strategic boreholes drilled to depths of approximately 3,500 – 4,000 meters can give access to storage sites with hot water at a likely 160° C or hot rock that can be used as a heat exchanger. The hot water or steam is transported to the surface of the earth where it can be used to generate electricity or heat buildings. After this water cools down, it is pumped back down to the naturally occurring hot rocks. The advantage of this form of energy compared with other renewable energies is that it is not dependent on the weather or time of day.

Aircraft noise

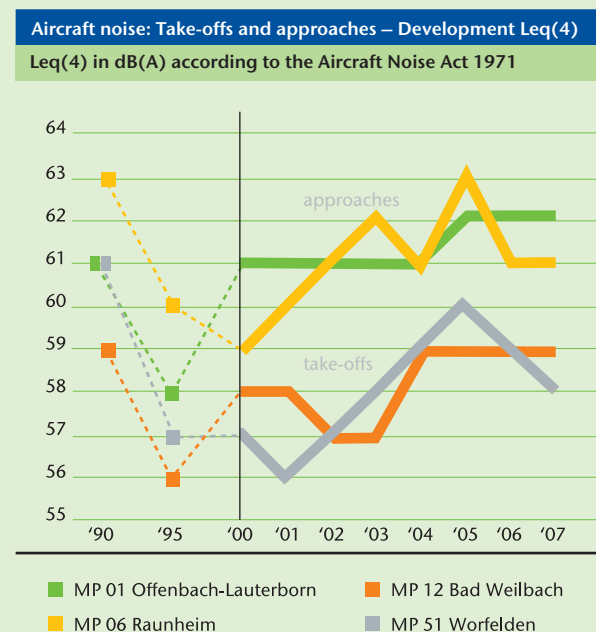
Traffic growth on a national scale

International air traffic has high growth rates, and the same unfettered increase in aircraft movements and passenger and freight volume is occurring at the national level. However, capacity constraints at Frankfurt Airport have put a brake on increasing traffic volume compared with other German airports. Frankfurt Airport has experienced a one percent increase in aircraft movements since 2004, whereas passenger volume has increased by six percent and airfreight by 19.7 percent. At other German airports, aircraft movements increased on average by 12.5 percent, passenger volume by 24.8 percent, and airfreight by 34.6 percent during this same time period. The comparatively low growth rates at Frankfurt Airport demonstrate that the capacity of the existing runway system has reached its limits. Frankfurt Airport will only be able to cope fully with the growing demand for slots once the new north-west runway is fully operational. The approval for the airport expansion granted in December 2007 constituted a key milestone. The long-term strategic objective of Fraport AG is to uncouple the projected growth in traffic from the associated noise pollution.



Aircraft noise development at characteristic monitoring stations

Aircraft noise has been continuously measured at Frankfurt Airport for more than 40 years. The system now encompasses 26 fixed monitoring stations, three mobile stations, and a bus measuring station. All the monitoring stations are in conformity with the latest technological standards. The equivalent continuous sound level $Leq(4)$ was the standard used for aircraft noise monitoring until the amendment to the German Aircraft Noise Act (Fluglärmsgesetz) became law in July 2007. A continuous sound level is calculated based on the aircraft noise events as identified by the noise monitoring system. The noise level and the exposure time of the individual noise will vary, and a continuous sound level is identified. The German standard DIN 45643 (Measurement and Assessment of Aircraft Noise) defines how the individual events are to be converted into a comparable continuous noise using different weightings for day and night aircraft movements. Night aircraft movements can significantly influence the development of the continuous sound level because they have a fivefold weighting under certain circumstances.



Leq(4) development and annual aircraft movements										
Leq(4) in dB(A) according to the German Aircraft Noise Act (Fluglärmsgesetz) (1971)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
MP 01 Offenbach-Lauterborn – Approaches	61	58	61	61	61	61	61	62	62	62
MP 06 Raunheim – Approaches	63	60	59	60	61	62	61	63	61	61
MP 12 Bad Weilbach – Take-offs	59	56	58	58	57	57	59	59	59	59
MP 51 Worfelden – Take-offs	61	57	57	56	57	58	59	60	59	58

The total number of aircraft movements at Frankfurt Airport has increased by 44 percent since 1990, with night flights increasing by 72 percent during this period. While the number of night flights made up far less than ten percent of total air traffic during the 1990s, it has now risen to a total of ten to eleven percent of total air traffic. The ratio of day aircraft to night aircraft movements has remained relatively stable since 2000 as a result of regulations defined by the Hessian Ministry of Economics, Transport and Regional Development (HMWVL). In 2006, the U.S. Air Force moved all their military activities from Frankfurt to Ramstein and all military flights at Frankfurt Airport ceased. This also exerted a positive effect on aircraft noise during the night.

The results from characteristic monitoring stations can be used to evaluate the historical development of aircraft noise over an extended period of time. The graph/table shows the development of aircraft noise since 1990 for approaches and take-offs measured at two characteristic monitoring stations. Although aircraft movements demonstrated a continuous upward trajectory, the equivalent continuous sound level had fallen by the end of the 1990s. This decline in noise pollution is mainly due to the fact that old, extremely noisy aircraft types – certified under the ICAO's noise certification Annex 16, Chapter 2, prior to October 1977 – were later no longer used after being replaced by new, quieter models. Since April 4, 2002, Chapter 2 civilian jet aircraft are only allowed to take off and land in Europe with special licenses, and only a few Chapter 2 aircraft were still operating at Frankfurt Airport at the end of the 1990s.

Aircraft flying in and out of Frankfurt since then have almost exclusively consisted of Chapter 3 aircraft, but the results of aircraft noise measurements have tended to increase as a result of the steady increase in aircraft movements. The values measured at the characteristic monitoring stations for the approach in Offenbach were between 61 and 62 dB(A), and between 59 and 63 dB(A) in Raunheim. In particular, the results from the monitoring station in Raunheim are influenced by the distribution of operations in a given year. The continuous sound level Leq(4) for departure routes is generally between 57 and 59 dB(A).

Fluctuation in the distribution of operations makes it difficult to identify a general trend for the development of measured values for aircraft noise within a short space of time. In terms of statistics, an average of 75 percent of flight operations at Frankfurt Airport are routed in a westerly direction, with aircraft taking off toward the west and landing from the east using the runways in the direction "two-five". Twenty-five percent of flight operations are routed in an easterly direction, with planes taking off toward the east and landing from the west using the parallel runways in the direction "zero-seven". A twofold increase in noise emissions at a monitoring station leads to an increase in Leq(4) by four dB(A), in conformity with the specifications defined in the German Aircraft Noise Act (Fluglärmsgesetz) for calculating the equivalent continuous sound level. Fluctuations in the distribution of flight operations exert a greater influence at monitoring stations mainly measuring flights routed in the easterly direction than at monitoring stations mainly measuring flights routed in a westerly direction.

Aircraft noise monitoring system

Approach and take-off routes, and stationary aircraft noise monitoring stations around Frankfurt Airport

Monitoring stations



Components of aircraft noise management

Avoiding noise pollution especially at night is particularly important and an array of regulations and restrictions has been put into place to prevent an increase in noise pollution.

Night flight restrictions

The Hessian Ministry of Economics, Transport and Regional Development (HMWVL) has enacted night flight restrictions for Frankfurt that prohibit unscheduled take-offs and landings throughout the night (22.00 until 06.00), arrival of scheduled flights between 24.00 and 05.00, and even landings of flights by airline companies based in Frankfurt between the hours of 01.00 and 04.00.

Additional night flight restrictions are also applicable on certain routes. In the case of route 25/westerly direction, heavy aircraft with three or four engines are banned from flying along the north-west departure routes MASIR and TABUM-GOLF, using the parallel runways between 22.00 and 07.00. These flights are instead directed over the south-

west night-time departure routes. Heavy aircraft with three or four engines are also banned from flying along the north-south departure routes 07-N-short and 07-S-short in the direction "zero-seven" (easterly direction), 24 hours a day. Shortly after take-off, the two routes lead from the parallel runway system in a northerly or southerly direction in the case of easterly operation, and between 22.00 and 7.00, all aircraft traffic is banned from this route because a university hospital is located directly below (07-N-short).

Allocation of noise quota points

The allocation of noise quota points was introduced to the summer 2002 timetable in an effort to reduce nighttime noise levels between 23.00 and 05.00. Aircraft types were divided up into seven noise categories with each aircraft movement being assessed on the basis of the noise it generated in conformity with data measured at the aircraft noise monitoring station. Noise points were allocated for each aircraft movement. Aircraft movements in Class 1 aircraft are equal to one quota point. The quota points are doubled for each higher category, i.e. two quota points are awarded for Class 2, and four quota points for Class 3.

Quotas were established for summer and winter flight schedules where the total number of permissible points of all planned aircraft movements was reduced by five percent compared with the 2000 summer and 2000/2001 winter schedules.

This initially limited procedure for the allocation of noise quota points was made more stringent for the winter flight schedule 2006/07 and the system was continued. The quota points available for the planned aircraft movements were reduced by a further five percent. A further aim was to calculate not only the quota points allocated for the scheduled aircraft movements in the period between 23.00 and 5.00 but also the quota points for the actual aircraft movements – in other words, including the “unscheduled” movements, which were mainly caused by delays or early arrivals. However, if the quota points of the actual aircraft movements significantly overshoot the allocated noise quota points and it appears unlikely that overshoots of this nature will decline, the Ministry can reasonably reduce the allocation of noise quota points for the next flight schedule period that is to be coordinated. The new regulations, applicable until the summer flight schedule 2008, made the official regulations on night flight operations valid up to that point stricter, and highlighted the special importance of providing protection against nighttime aircraft noise.

Introduction of the noise abatement CDA (continuous descent approach) procedure for night flights

Since the beginning of April 2005, all aircraft arriving at Frankfurt Airport at night have been using the Continuous Descent Approach (CDA) for a trial period. The CDA procedure stipulates that engines should be switched to neutral at high altitudes and the rest of the descent be completed by gliding in. The length of the landing route depends on the starting altitude, the rate of descent, and the speed of the aircraft. This CDA procedure can therefore only be used at night in Frankfurt, between the hours of 23.00 and 05.00. During these times delays are unlikely to occur for subsequent aircraft owing to the low level of traffic. The CDA procedure has now become standard practice during the hours of 23.00 and 05.00.

Noise-based charges as part of airport charges

Fraport introduced noise-based charges for take-offs and landings as early as 1993. Revised airport charges came into effect in January 2001. The noise-based charges were divided into 7 categories which were for the first time calculated on the basis of noise measurements taken at Frankfurt Airport. These categories are adjusted and updated each year. The noise-based charges are levied for each take-off and each landing. Since January 2008, aircraft have been allocated to eight noise categories. These categories are determined on the basis of average take-off noise levels calculated in conformity with DIN 45643 with reference to aircraft types viewed singly or in groups. These noise-based charges are intended to give airlines a significant financial incentive to operate low-noise aircraft when traveling to and from Frankfurt. Since 2005, these noise components have been divided into the night sub-groups of marginal nighttime hours (22.00 to 22.59 and 5.00 to 5.59), and a night core time (23.00 to 04.59). Take-offs and landings during the core nighttime are intended to be unattractive due to the additional costs.

The airport charges established with effect from January 1, 2008 include an emission-based component in addition to the noise-based component. This is presented in greater detail in the chapter on Air Quality. A noise category 0 was created in addition to the noise classes Categories 1 to 7 for classification of aircraft types according to noise. Aircraft types are allocated to Category 0 if they have an average take-off noise level of up to 68.9 dB(A) LAZ. This allows improved differentiation according to aircraft type.

Passive noise abatement

The Noise Abatement Program launched by Fraport AG in March 2002 is well advanced. Noise abatement measures are being carried out in buildings located close to the airport. The noise abatement area is bounded by a contour defining an area in which an average of six aircraft noise events occur each night with maximum levels of at least 75 dB(A). A second contour is also used at nighttime, which is defined on the basis of an energy equivalent continuous sound level $Leq(3)$ of 55 dB(A). The abatement goal is defined such that a maximum level of 52 dB(A) is not generally exceeded in all rooms generally used for sleeping during the night if the windows are closed. Around 17,500 households in 15 towns and villages are located in the night

abatement area. Nurseries, schools, hospitals, and retirement homes were also included as being particularly important for noise abatement measures. Important measures included installation of soundproofed windows, sliding shutter units, and fans in bedrooms and children's rooms.

The status of the program in May 2008 was as follows:

- Submitted proposals: 5,400.
- Prepared action plans and cost approvals: 5,000 proposals with 13,000 living units.
- Action plans implemented by the applicant and reimbursed by Fraport: 4,050 applications with 8,300 living units.

Compensation and real-estate purchase program "Fraport Casa"

This compensation program is intended for owners of residential property who bought or built a house or apartment in the expectation that this would not be located in an approach flight path with particularly low overflights. This is the case in Flörsheim and Kelsterbach. The recommendation of the state planning assessment was used as the basis for the subsidy criteria. Compensation payments are made.

Ten-Point Action Program

The Ten-Point Action Program of Fraport AG was established in May 2000. The program encompassed a range of recommendations and activities aimed at further reducing noise levels and ensuring local residents get a good night's sleep. The program has now essentially been implemented. An "Anti-Noise Pact" was developed as a successor to this program with the aim of further reducing aircraft noise in the vicinity of the airport.

Innovations in aircraft noise management since 2005

Amendment to the Aircraft Noise Abatement Act

The amendment to the German Aircraft Noise Abatement Act (Fluglärmschutzgesetz) came into force on June 7, 2007. This ushered in a new era for the calculation and evaluation of aircraft noise in Germany, particularly since the definitive noise values take account of the latest research into the impact of noise. Although the Aircraft Noise Abatement Act primarily establishes the criteria for defining the noise abatement area at airports – based on forecasts for air traffic – the assessment criteria specified in the law apply equally to aircraft noise measurement.

Three key characteristics have changed for the noise values specified in the new Aircraft Noise Abatement Act. The previous equivalent continuous sound level $Leq(4)$ for a 24-hour day, which was determined taking different weighting factors for day and night aircraft movements into account, has now served its purpose. This value has been replaced by energy equivalent continuous sound levels $Leq(3)$ that differ for day and night. The development of aircraft noise pollution is more transparent as a result of regarding the two parts of the day separately.

Legislators have also used the energetic mean with the halving parameter $q = 3$ for the continuous sound level. Selection of the parameter $q = 4$ in the former Aircraft Noise Abatement Act was based on studies which proved that halving the length of the noise duration or the noise frequency is equivalent to a reduction in the maximum level by $q = 4$ dB as far as the disturbance effect is concerned. However, the energetic continuous sound level with the halving parameter $q = 3$ has become established internationally. In practical terms, this means for the energy equivalent continuous sound level $Leq(3)$ that if the aircraft mix remains identical and the number of flights passing the monitoring station doubles, the continuous sound level increases by three dB. If the number of aircraft movements is decreased by half, the continuous sound level comes down by three dB.

A level frequency criterion was also introduced for the night in addition to the energy equivalent continuous sound levels. The frequency at which an aircraft noise maximum level L_{ASmax} above 72 dB(A) occurs on average each night has to be calculated at a monitoring station for the six months of a year with the highest traffic densities.

If this number encompasses six or more events, the monitoring station is within the night protection zone.

Some subsidiary regulations in the Aircraft Noise Abatement Act, which define the conditions for enforcement of the law, are currently being revised or amended and these regulations still have to be ratified. They include a binding "Introduction to the calculation of noise abatement areas" (German instructions for modeling of aircraft noise).

Increased requirements for noise certification of new aircraft types

Since January 1, 2006 newly certified civil aircraft types must comply with the tougher requirements of the International Civil Aviation Organization (ICAO) for noise certification. The permissible noise limits are defined in Volume 1 of Appendix 16 to the Agreement on International Civil Aviation. The total of all three certification measuring points for these so-called Chapter 4 aircraft must be ten decibels less than the certification limits of Chapter 3 for type certification. The certification measuring points are precisely defined points for the approach, the sideline, and during take-off, in accordance with ICAO.

A number of aircraft types which were certified in conformity with Chapter 3 regulations already meet the new Chapter 4 noise requirements. For example, the Airbus 380 recorded a value of at least 26 EPNdB less than the requirements for Chapter 3 aircraft over the total of all measuring points. EPNdB is the Effective Perceived Noise Level, which was introduced as an international parameter specifically for certifying the noise emitted by large aircraft. The noise values for certification of the A380 are generally between three and five EPNdB below the noise value of the Jumbo B 747-400, depending on the certification measuring point.

The sample comparison between the A380 and the B 747-400 shows that aviation engineers have successfully produced a much heavier aircraft in the latest generation which is much quieter thanks to advanced engines.

A key for reducing noise pollution in the region

The joint declaration signed by Fraport, Lufthansa, the state of Hesse, German Air Traffic Control, the Board of Airline Representatives in Germany (BARIG), and the Chairman of the Regional Dialog Forum on December 12, 2007 opened a new door to reducing the level of aircraft noise. Noise reduction at the source itself constitutes a key building block for this voluntary agreement. This is known as active noise abatement. The agenda for potential active noise abatement measures includes tests for lifting the approach glide angle, increasing the tail-wind component, lateral and vertical optimization of take-off and landing procedures (dedicated runway operations), and measures to reduce noise emissions from the aircraft itself. The voluntary agreement also describes ways of achieving a regional settlement and defines measures for passive noise abatement and real-estate management. The overarching goal of all these measures is enhanced mutual trust between the airport, its users, and the residents living nearby. Cooperation in the region is directed toward transparency, information, and open dialog.

Measures derived from the approval of the Zoning Plan

The approval of the Zoning Plan defines detailed measures relating to expansion. These include expansion of the aircraft noise monitoring system by installing additional monitoring stations along new or changed approach and take-off routes. Illustrations of isophones for energy equivalent continuous sound levels $Leq(3)$ during the day and at night, and isophones equivalent to six flight events above a maximum level of 72 dB(A) at night are to be generated on a regular basis. The scheduled aircraft movements during the night are to be strictly restricted to an annual average of 150 movements per night. A noise abatement installation must be erected for ground run-ups. Concrete permissible noise values must be specified for acoustic power emitted from high-rise buildings and freight-forwarding areas.

The precise regulations are defined in the adopted Zoning Plan for expansion of Frankfurt Airport dated December 18, 2007 (click on <http://www.wirtschaft.hessen.de>).

Biodiversity

Maintenance and support of the natural biodiversity at the airport and in the surrounding region is an important focus in the upcoming and imminent construction projects for airport expansion. The impact exerted by construction work on the immediate environment is offset by compensation or substitution measures, for example reforestation or improvement of existing woodlands. Mitigation measures are also implemented, such as the resettlement of rare or endangered species. Biodiversity is also a key issue for the Fraport Environmental Fund, which supports a wide range of ecologically important projects within the Rhine-Main region.

Airport biotope

The results from assessments performed by external experts on the airport's biotope in previous years constitute an important guideline for the implementation of measures directed toward environmental protection and biotope management at the airport site. These include protection of small but biologically significant diverse and highly diverse habitats along the margin of Runway 18 that are home to rare species of plant, bird and reptile, bird-strike management that is important for air safety, and large-scale landscaping of open spaces, courtyards, roofs, and facades.

The Institute for Beekeeping of the Polytechnic Society in Oberursel carried out an important research project on airport biodiversity and the first results were produced in 2006 and 2007. The institute located eight honey bee colonies at the Frankfurt Airport site. Bees are very sensitive to environmental changes and therefore provide an early-warning system. These bees are yielding information on the status and development of biodiversity at the airport. The results show that the ecological biodiversity at the airport site is significantly above average.

Mitigation measures for airport expansion

Environmental feasibility studies were carried out for the current and planned construction projects during the approval procedures for airport expansion. The effects of airport expansion on the environment and biodiversity can in this way be identified, assessed, and demonstrated at an early stage. Particular emphasis is being placed on studying the effects of the project on humans, the countryside, water, air, climate, soil, cultural monuments, and flora and fauna. The interactions between the individual environmental aspects also play a role. Dedicated surveys are being commissioned to provide assessments in accordance with European legal stipulations on nature and species protection. All relevant findings from the surveys will then be incorporated in the plans.

The groundwork that is being carried out means that the statutory compensation measures can often be implemented before work starts on construction or during the initial construction phase. The experts from the Fraport Forest and Biotope Department carry out two steps. If construction measures are planned for areas that have not yet been developed, initial measures are taken to facilitate maximum avoidance or reduction of the foreseeable impacts on the natural environment. If this is not possible, more sophisticated measures are planned in order to compensate for unavoidable interventions.

In past years, a wide range of mitigation and compensation measures were implemented, including the following:

- ***Hohenaue Nature Conservation Area – floodplain forest***
The Hohenaue Nature Conservation Area is located in the administrative district of Groß-Gerau. This is an area previously used for intensive agriculture and is regarded as a mitigation measure for forest and nature conservation, especially in relation to CargoCity South. The area was purchased by what was then Flughafen Frankfurt/Main AG in 1991 and encompasses approximately 100 hectares of land. It is located near Trebur close to the Altrhein.
- ***Reforestation Hofgut Schönaue***
In 2004, Fraport reforested some 21 hectares of land in the Hofgut Schönaue mitigation project. This is located in the district of Rüsselsheim and is intended to compensate for

the loss of woodland due to the construction of the A380 hangar and maintenance facilities. Before the first tree was felled at the hangar site in September 2005, mitigation planting had already taken place. More than 130,000 trees and around 10,000 shrubs were planted in order to create a mixed deciduous forest dominated by oak trees.

- ***Improvements in existing woodlands***

The addendum to the Zoning Plan approval for the construction of the A380 hangar and maintenance facilities designated some 50 hectares of woodland in the areas “Mönchbruch von Mörfelden”, Schwanheimer Wald, and Rüsselsheimer Staatswald as a mitigation area. The goal here was to improve the existing forest, create a deciduous woodland in keeping with the site, and develop an ancient woodland for the coming generations.

- ***Resettlement of protected animal and plant species***

A number of rare animal species were relocated in neighboring biotopes before construction work started on the A380 hangar. Sand lizards that had settled around the airport and that are protected throughout the EU were captured and relocated to suitable substitute habitats. Tree roots likely to be home to stag beetle larvae were lifted in a new type of procedure and relocated in an appropriate sunny oakland wood outside the construction site. Ant nests were also relocated. Before construction on the new north-west landing runway commenced, the airport ecologists have once again started to examine the areas intended for construction to identify protected animals and plants which need to be relocated. All the results are recorded and defined with location, number and species. The environmental measures are then implemented on the basis of the preparations and completed before further expansion of the airport is carried out. These include resettlement of the protected natterjack toad and the agile frog, the provision of artificial nesting aids for birds around the felling area, and creation of artificial caves for bats. The ecologists also keep records on plant diversity around Frankfurt Airport. There are a number of species which are rare and protected. This means that special measures have to be taken. The seeds of annual plants are harvested (i.e. the genetic material) and sown elsewhere. Rare lichens and mosses are removed and replanted at a different site. Perennial plants such as irises are dug up individually and replanted.

Fraport Environmental Fund

As a good corporate citizen, Fraport AG pursues the principle that environmental protection should not end at the airport perimeter fence. The company therefore set up an environmental fund in 1997. The aim of the fund is to promote sustainable environmental and conservation projects. Apart from ecologically important measures for landscaping, renaturation and biotope preservation, financial support has also been provided for scientific research and an increasing number of educational environmental projects during recent years. Measures for retaining biological diversity in the region are a particular focus for environmental financial support. They include various research projects for mapping biotopes and concrete projects such as the development of river-valley meadows in the “Hessian Ried”, a landscape in the Rhine valley between Lampertheim and Groß-Gerau, or preservation of orchard meadows in the valley of the River Main.

Fraport AG has employed a biologist and a nature and animal instructor to assist with environmental education in schools and nurseries. They provide nature excursions and presentations in educational institutions free of charge. The objective of these services is to stimulate interest in nature and the environment among children and motivate them to act responsibly. A Water Researcher Set is also offered for nurseries and elementary schools and this allows schoolchildren to analyze water quality and identify and observe plant and animal species living in the water.

A total of more than 500 different individual measures has been financed by the Fraport Environmental Fund to date at a cost of more than 22.5 million euros. The voluntary funds are used exclusively for measures in the area surrounding the airport and they are not credited against mitigation measures for expansion of the airport.

Drinking water and service water

Water supply: secure and dependable

Frankfurt Airport's drinking water (potable water) network is supplied by the Hinkelstein municipal drinking water treatment plant which is located about three kilometers from the airport. The water is routed via two separate pipelines into two chlorination plants and distributed throughout the airport using an internal looped system. In emergencies, two additional supplies increase the amount of water fed into the airport's internal water network. Water pressure in the fire hydrants for extinguishing fires can be increased to the required level using internal or external booster stations.

Drinking water: declining trend

The consumption of drinking water at FRA was nearly 1.7 million cubic meters in the year 2007. Fraport AG consumed 967,000 cubic meters, representing a share of 58 percent. While the amount of drinking water required is declining, the volume of service water (non-potable water) continues to increase. The percentage of service water in overall water consumption went up by 4.4 percent to more than eight percent between 1998 and 2007.

When compared with air traffic (measured in traffic units, one traffic unit is equivalent to one passenger or 100 kilograms of freight), the water conservation effects over past

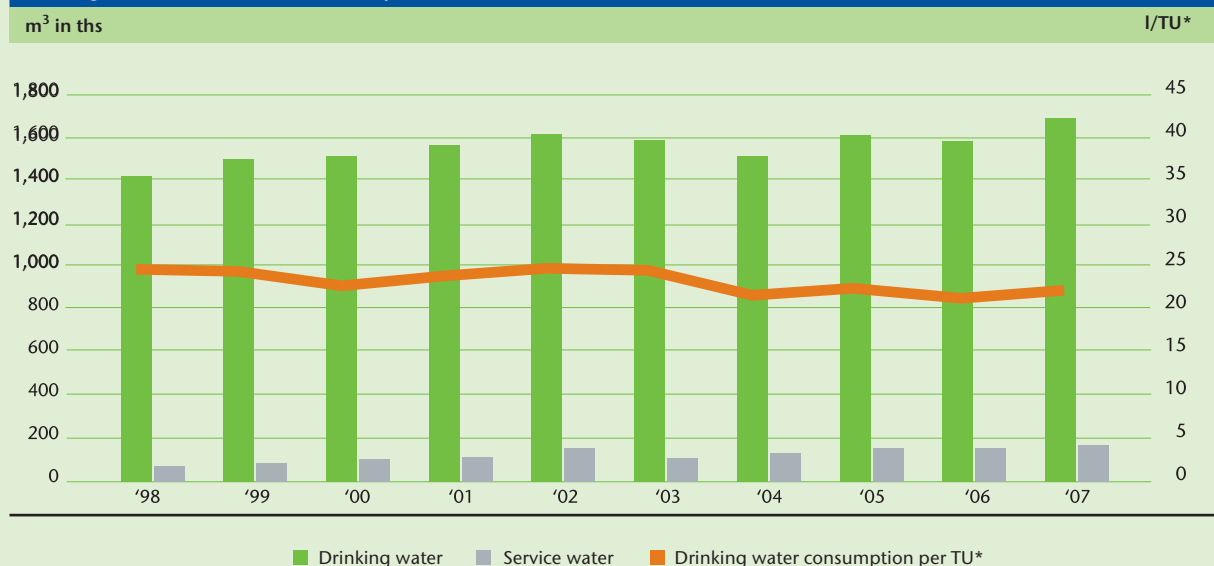
years are evident. The slight increase in water consumption per traffic unit in the years 2001 and 2002 was due to new buildings connected to the distribution system and the growth in the number of employees working at the site. The temporary decline in the volume of air traffic precipitated by the events of September 11, 2001 led to a calculated increase in specific total water consumption. Water use declined again when traffic increased from 2004 and amounted to 22.3 liters in 2007.

Service water: the ecological alternative

Fraport is continuing to expand the supply of service water at the airport. Service water is generated at Terminal 2 in a rainwater collection plant using fresh water, rainwater, and water from the River Main. This water is piped through a separate supply network to sprinkler systems, WC flushing, and is used for watering landscaped areas. Another source of supply for treated river water from the Main is projected for the future and this will replace part of the drinking water used for sprinkler and sanitary facilities.

Five groundwater extraction wells are located in the southern part of the airport, and groundwater is pumped out of these wells into the service water network for the southern part of the airport. An integrated infrastructure for service water has been installed throughout the new construction area.

Drinking water and service water consumption



Measures

Future plans are in place to extend the service water network to all suitable areas of the airport. A network of pipes is being constructed during the ongoing refurbishment of Terminal 1 which will supply toilets and urinals with service water. The pipelines in the service water network are made of stainless steel to provide a clear distinction from drinking water.

Reduction in the consumption of drinking water at Terminal 1

The reduction of drinking water consumption in Terminal 1 by up to 15 percent was achieved in the year 2008. Since June 2008, all wall hydrants and the associated pipelines for toilet installations have been supplied with service water from substation 3 (approx. six percent). Furthermore, service water supply is in place in buildings 205 and 206 at Terminal 1 at the same time (approx. eight percent). Other areas in Terminal 1 will be supplied with service water by the end of the year, for example the Lufthansa Arrival Lounge B (one percent).

A new project for exploiting service water is being designed for individual interface areas in Terminal 1. The plan currently envisages that approximately 38 percent of the entire water consumption in Terminal 1 will be covered by non-potable water by 2014:

2008:	approx. 15 percent
2009:	approx. 8 percent
2010:	approx. 4 percent
2011:	approx. 4 percent
2012:	approx. 4 percent
2013:	approx. 3 percent

The supply of service water in public areas may amount to a total of 60 percent. The potential savings in shower, washing and operational areas are set at a maximum of 25 percent. Water meters will verify the proportion of the requirement for service water as a function of total consumption in Terminal 1.

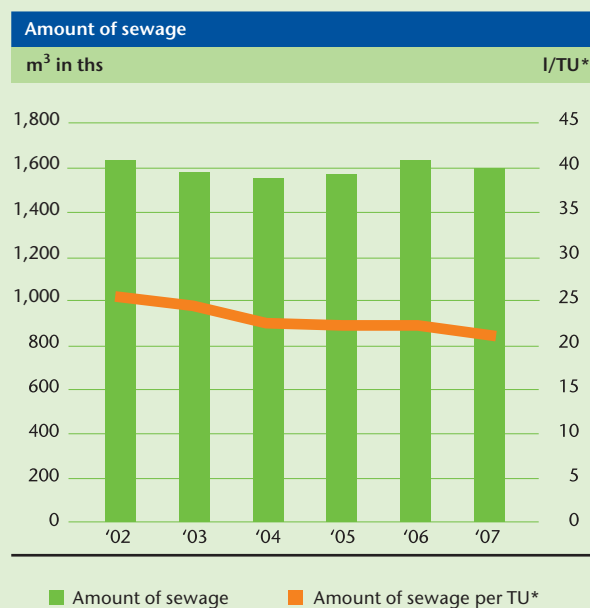
* A "Traffic Unit" (TU) is equivalent to a passenger with baggage (excluding transit passengers, according to ADV and ACI) or 100 kg of cargo or mail.

Wastewater

Sewage levels remain constant

Separate drainage systems are provided for storm water and sewage water at Frankfurt Airport. Whereas clean storm water is discharged into the River Main, drains away, or is used as service water, sewage water is piped to various treatment plants for purification. Sewage water from the northern section of the airport is pumped via the public sewage system to Frankfurt-Sindlingen and Frankfurt-Niederrad. The water from the southern section of the airport goes to an on-site sewage treatment plant.

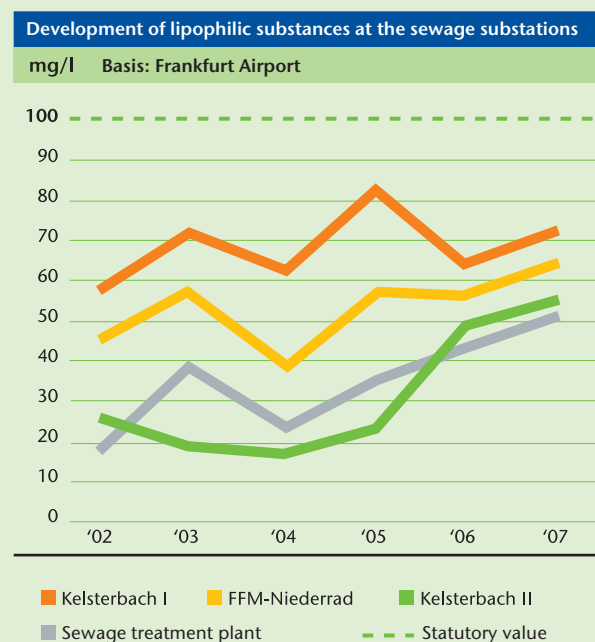
In 2007, the volume of sewage water amounted to nearly 1.61 million cubic meters. The diagram below clearly shows that the volume of sewage water has remained virtually constant despite the rise in traffic volume since 2002. The increased installation of water-saving devices and fitting of additional water meters have contributed to this. The environmental impact of this sewage water was approximately equal to 42,600 inhabitants (population equivalents) in the year 2007. A population equivalent represents the organic pollution (measured as the BOD = Biochemical Oxygen Demand) produced by one inhabitant in a day. A declining trend emerges if this is converted to the amount per traffic unit. The reduction has totaled nearly 16 percent since 2002.



Wastewater plants are monitored continually

The quality of sewage water is monitored in conformity with the wastewater regulations of the city of Frankfurt Main and the city of Kelsterbach by means of random samples taken from the relevant confluence points with the public drainage networks or in Fraport's own sewage treatment plant.

The wastewater plants, e.g. the oil separators or the grease separators, are regularly monitored with the objective of maintaining the necessary quality of the sewage water. Similar to previous years, the annual average for lipophilic materials (vegetable and animal oils and grease from kitchens and restaurants) was significantly below the statutory value of 100 milligrams a liter at the confluence points with the public drainage network. Continual upgrading of grease separators and their adjustment to current circumstances, or fitting with advanced downstream treatment plants, guarantee compliance with the statutory values even when additional restaurant facilities come onstream in the wake of further growth.



Soil, contaminated areas and groundwater

Remediation where necessary

The native soil types have often been changed by historical damage due to wars and intensive land use. The former US Air Base is one of the areas with contaminated soil and groundwater. This was handed over by the Air Force at the end of 2005.

CargoCity South (part of the former US Air Base)

Historical research conducted on the first land parcel of the US Air Base that was vacated (the present CargoCity South) identified some contaminated areas. Detailed investigations were carried out as a result of this research. The required remediation measures related to soil contamination have essentially been completed. However, groundwater contamination beneath the area is still being investigated so that any necessary measures can be instituted.

Former US Air Base

Extensive historical research was carried out on the former US Air Base facility. The subsequent exploratory investigation and the contamination identified in the course of demolishing the Air Base is mainly restricted to the areas of the kerosene storage tanks. This involves mineral oil pollution. Contaminated soil that was affected by demolition of the facilities has already been removed and disposed of appropriately. Detailed examinations of the soil and groundwater were carried out in order to contain pollution further down. The result of these investigations will be presented to the responsible authorities and any necessary measures will be carried out in consultation with the authorities.

Investigation and evaluation

Starting in 1996, data associated with the investigation and clean-up of the contaminated areas of the former US Air Base and CargoCity South were compiled using a Geographic Information System (GIS). Contaminated sites, areas with suspected contamination, reinstatement measures, and other programs are all defined pursuant to the Federal Soil Conservation Act (Bundesbodenschutzgesetz, BBodSchG), as well as other legal requirements and guidelines. Known contamination of the soil will be addressed during site development in consultation with the responsible environmental agencies.

Contribution to extraction of drinking water

Frankfurt Airport is situated within the catchment area of the drinking water supply facilities in the districts of Hinkelstein and Schwanheim. The eastern section of the airport is listed as part of the water conservation area Zone III B (extended conservation area, outer section). In the south-eastern section of the airport, the groundwater flows to the north-west toward the pumping stations at a velocity of 0.5 to 1.0 meters per day. In the south section, the depth of the groundwater is between two and six meters, whereas the depth in the north ranges from ten to 15 meters below the surface. In parts of Runway 18 West, the groundwater table is even less than two meters beneath the surface of the ground.

There is a dense network of groundwater monitoring stations on the airport site and in the surrounding area, and the results of the measurements are entered in a database. The responsible authorities and the water supply companies are integrated in the groundwater monitoring carried out by Fraport AG, and the results of the measurements guarantee a high level of control. A water conservation alarm plan is a constituent element of the Emergencies Orders (BA NOT) and this plan ensures that any damage occurring is immediately reported and remedied.

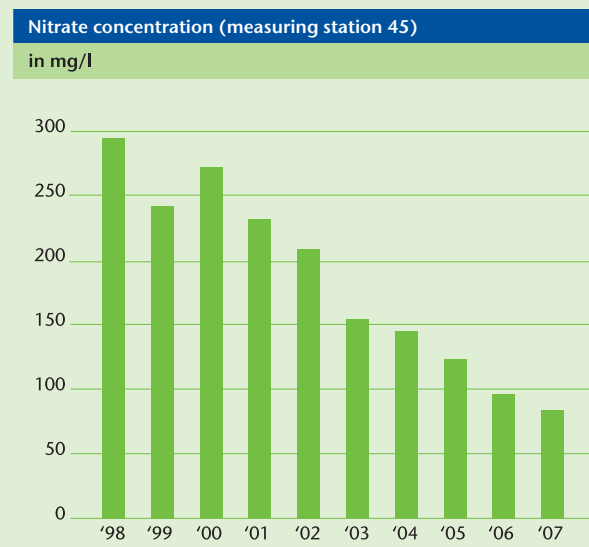
* A "Traffic Unit" (TU) is equivalent to a passenger with baggage (excluding transit passengers, according to ADV and ACI) or 100 kg of cargo or mail.

Dangerous goods and hazardous materials

Nitrate removal from the groundwater

The groundwater below the airport was contaminated with nitrates during the past due to the use of deicing agent containing nitrates. A denitrification plant is used to remove the nitrates from the groundwater and this has been treating water polluted with nitrates at a rate of 300 cubic meters an hour since 1999. The plant has been operating very successfully and this is evident from the development of the annual average values for nitrate concentration at a selected monitoring station.

Since 1990, Fraport has only been using nitrate-free deicing agents (potassium acetate, potassium formate) for the de-icing of airfield surfaces.



Safety first

When dealing with the transportation and storage of dangerous goods as well as the handling of hazardous materials, Frankfurt Airport applies the most important general rule within international aviation: "Safety first". Top priority is given to the strict observance of national laws and international regulations. Key elements for the implementation of such laws and regulations include practical courses and regular training of employees geared to minimizing potential risks.

Dangerous goods: stringent monitoring

The legal basis in Germany for transporting and storing dangerous goods is the German Dangerous Goods Transportation Act (Gefahrgutbeförderungsgesetz, GGBefG), which is supplemented by the rules of the International Civil Aviation Organization (ICAO). In order to train all the personnel involved and ensure they have understood all the regulations, Fraport conducts regular training courses for more than 5,000 employees to ensure that they adhere to all the relevant provisions and regulations. Furthermore, dangerous goods and radiation protection officers are responsible for observing regulations and overseeing the transportation, acceptance, delivery, temporary storage, packing, unpacking, loading, and unloading of dangerous goods.

All the companies involved are considered part of a single transportation chain for shipping dangerous goods. Airlines and freight forwarding companies employ an adequate number of specialists and equipment in accordance with the regulations. The handling and trading of such goods at the airport is carried out by Fraport Cargo Services GmbH (FCS), airlines, or cargo handling companies acting on behalf of the airlines. In 2007, FCS alone handled around 2,900 tons of dangerous goods. The use of special central storage facilities is mandatory for radioactive substances. Other dangerous goods are stored by FCS in CargoCity South. A dangerous goods warehouse facility is operated there in conformity with the Federal Impacts Control Act (Bundesimmissionsschutzgesetz, BImSchG). Employees at this facility check the physical properties and the documentation of each dangerous goods consignment. Dangerous goods specialists are also responsible for ensuring the safe transfer of dangerous goods to the receiving airports.

Emergency management: Nothing left to chance

As soon as even minor external damage is detected in containers for dangerous goods, the Fraport security service and the airport fire department are alerted. They possess the necessary knowledge and special equipment to respond adequately. The number of dangerous goods incidents involving Fraport continues to decline. In the year 2007, only four incidents involved damage to packaging in around 100 discrepancies involving the handling of dangerous goods. Every two months, a dangerous goods committee holds a meeting. The members of the committee include employees of Fraport AG and representatives from the airlines, the appropriate authorities, freight forwarders, and cargo handling companies. Emergency procedures are documented in Fraport's Emergencies Orders (BA NOT). Emergency plans are drawn up on the basis of this manual and emergency exercises are carried out on a regular basis. Regular training, promotion of enhanced awareness among employees to the potential risks of dangerous goods, and continuous exchange of information between German airports and cargo handling companies complete the precautionary measures.

Dangerous goods: less is more

Hazardous materials are materials that possess hazardous characteristics or may release hazardous substances – for example at the workplace.

Since 1990, Fraport has implemented a product evaluation procedure that reviews all chemical products before they are purchased. This involved the responsible employees from the relevant areas and the users. An assessment is carried out to ascertain whether chemical products can be replaced by a more environmentally friendly product, or the relevant operational process can be discontinued or modified.

Most hazardous materials are used at Real Estate and Facility Management (IFM) in vehicle workshops, the paint shop, and the airport print center. The range of products extends from antifreeze fluids, engine oils, coolants, transmission and hydraulic oils, paints, varnishes, soap cartridges, through to heating oil. The hazard analyses carried out in conformity with the new Ordinance for the Handling of Dangerous Substances (GefStoffV) were implemented here, or existing analyses were updated.

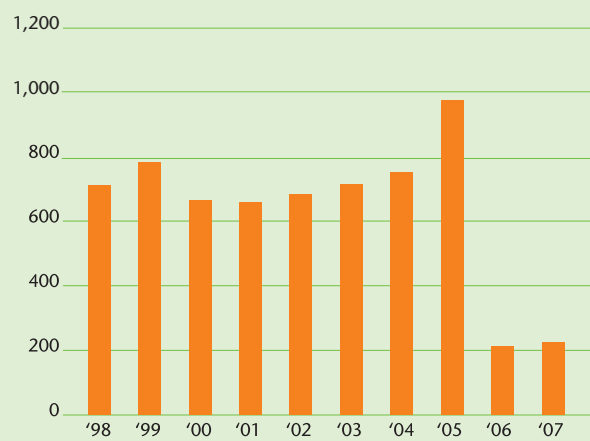
Since 1999, the number of products containing hazardous materials has been reduced by 47 percent from 700 to 370. A reduction by 28 hazardous materials to a total of 370 was carried out from the end of 2006 (398 hazardous materials) to the end of 2007. This most importantly relates to hazardous materials that are flammable (such as cleaning agents) or harmful to water (hydraulic and transmission oils). In addition, eight hazardous substances have been included which will be eliminated from the airport print center as a result of the introduction of new technologies.

Statistics do not include materials which were intended to be used, for example, by the cleaning company Gesellschaft für Cleaning Service mbH & Co. (GCS) at the airport but which were rejected from the outset (cleaning agents and air fresheners that trigger allergic reactions).

The quantity of hazardous materials that were supplied to Fraport AG as dangerous goods and consumed (not including diesel fuel and gasoline) fluctuates from one year to the next, since surface deicing agents make up a particularly large proportion. During the years 2006 and 2007, no additional deicing agents were required due to the mild weather conditions and absence of snowfalls. Surface deicing agents amounted to 757 tons in the year 2005 and the proportion of the overall hazardous materials was very high. Another factor was that less propane gas was used during training courses for aircraft firefighting at the Fire-fighting Training Center (FTC).

Amount of hazardous materials supplied as dangerous goods ¹⁾

in t Basis: Fraport AG



¹⁾ excluding fuel

Waste management

Highest environmental standards

The foundation for waste management at the airport is the German Substance Cycle and Waste Management Act (Kreislaufwirtschafts- und Abfallgesetz) because this act implements the provisions of the European Community (EC) Directive 2006/12/EC on waste (Waste Framework Directive) and makes them binding in Germany. The objective of this act is to encourage recycling management with the aim of conserving finite and natural resources. Avoidance of waste is a top priority. If avoidance is not possible, waste should be recycled as far as possible and final disposal is the third option. As in previous years, Fraport works together with accredited waste management companies that operate certified waste management facilities and are regularly validated by inspectors. This guarantees the highest environmental standards.

Introduction of new waste concepts

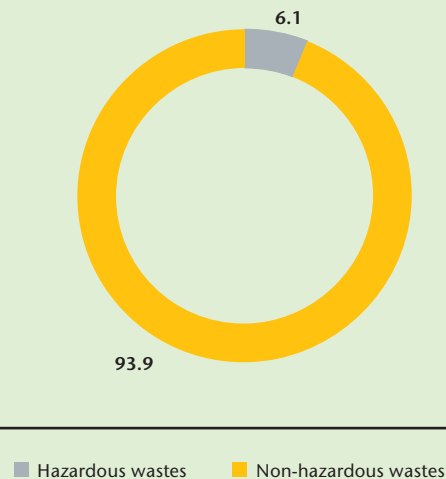
While a distinction used to be drawn between waste that did not require monitoring, waste that required monitoring, and waste that required special monitoring and permits, the amendment to the German Substance Cycle and Waste Management Act (Kreislaufwirtschafts- und Abfallgesetz) dated July 15, 2006 harmonized the definition of concepts with EU law. Waste that used to be designated as requiring special monitoring and permits is designated as hazardous waste, while waste that requires monitoring and waste that does not require monitoring are designated as non-hazardous waste. Certificates in conformity with waste regulations must be provided for hazardous and some non-hazardous waste.

Minimization of hazardous waste

Waste primarily accrues from actual air traffic, handling of services related to air traffic, the premises occupied by offices, tenants, and concessionaires, as well as maintenance measures and new construction projects. Fraport defines a waste balance sheet with detailed data about the different types of waste.

Waste categories 2007

in %



In 2007, Fraport disposed of approximately 24,700 tons of waste, excluding soil and building rubble. Non-hazardous waste represented the largest category at 93.9 percent. The amount of hazardous waste represents 6.1 percent of total waste. The materials recycling rate for the waste generated at the airport has declined slightly over the past 5 years, but continues to remain at the high level of approximately 83 percent. The main reason for the slight decline in the recycling rate compared with the previous year relates to the fluctuations in the amount of waste that are derived from non-cyclical occurrence.

The total amount of waste rose by 5.1 percent compared with the previous year. However, the amount of hazardous waste came down by 22.7 percent. The largest amount of hazardous waste is composed of sand trap residues, oil separator fractions, and machine oil, engine oil, and other wastes containing oil.



Dismantling the former Rhine Main Air Base

On January 1, 2006, ownership of the premises of the former air base located in the southern section of Frankfurt Airport was transferred to Fraport AG. The new Terminal 3 will be constructed on this site in accordance with the Zoning Plan procedure.

Initial demolition work began in March 2007 and continued until February 2008. Approximately 100 buildings with a total volume of 680,000 m³, around 16 hectares of paved area (concrete, asphalt, pavement, mixed surfaces), and 44 km of services pipes were demolished.

Approximately 62,000 m³ of concrete, brickwork, and ground material were used to refill building excavations, pipework trenches and underground tanks. Around 70,000 m³ of concrete were left over as material to be used for upcoming construction work on the premises. An estimated 2,400 tons of metal and 350 m³ wood chips from roots and undergrowth can be reused. Approximately 65,000 tons of concrete, brickwork, and ground asphalt will be reused and reprocessed for external construction projects, as well as around 470 tons of synthetic mineral fibers.

Additionally, some 45 buildings (approximately 560,000 m³ in volume), approximately 22 hectares of paved area, and approximately 27 km of service pipes were demolished during the period from October 2007 to May 2008.

Approximately 65,000 m³ of concrete, brickwork, and ground materials were used to fill excavations, utility trenches, and parking areas. Some 2,000 tons of metal can be recycled. Around 53,000 tons of concrete, mixed recycling materials, and ground asphalt are being used for external construction projects, as well as an additional 370 tons of synthetic mineral fibers that can be reused and reprocessed.

For more information, please consult the Fraport AG brochure "From waste to raw material – waste management at Frankfurt Airport" (Von Abfall zum Rohstoff – Abfallwirtschaft am Flughafen Frankfurt) December 2007.

Expansion plans and construction

On December 18, 2007, the adopted Zoning Plan for further expansion of Frankfurt Airport was signed by the Hessian Minister of Economics. When the official approval of the Zoning Plan was delivered at the beginning of January 2008, the path was open for the expansion of capacity planned at Frankfurt Airport over a period of many years. The Zoning Plan procedure examined the environmental compatibility of the development plans – essentially for the north-west runway and the new Terminal 3 – on the basis of three overarching issues:

- Project impacts caused by new site: felling trees, excavations and sealing, effects on drinking water and groundwater.
- Project impacts caused by operations: aircraft noise, air pollutants, bird strike, potential accident scenarios.
- Project impacts caused by construction: environmental effects during the construction period.

Following a thorough review by the authorities, the Zoning Plan approval confirms that all the statutory environmental protection regulations have been complied with. The very complex expansion program can therefore be realized over the coming years.

Overview of the most important construction measures

The north-west runway and Terminal 3 constitute the core of capacity expansion and this will allow Frankfurt Airport to accommodate the 88.3 million passengers (2007: 54.2 million passengers) projected for 2020. The following scenario is projected at the current time (status April 2008):

- North-west runway: The runway will have a length of 2,800 meters and will join up with the airport site via two bridges across the A 3 and the ICE high-speed rail track. The 162 hectares of forest that will have to be felled will be mitigated in full by biologically diverse new forestation. The new runway is projected to come into operation by 2011.
- Terminal 3: The new terminal in the south of the airport site comprises a hall 240 meters in length, four piers up to 610 meters long with 75 building and apron positions for aircraft, as well as additional taxiways, dedicated access roads, multistorey car parks, and other facilities. The building is planned in a modular design and can therefore be adapted to the prevailing traffic requirements. The terminal is scheduled to come onstream in phases in line with the increasing demand for handling capacities.
- Terminal 1: Extensive upgrading measures throughout the terminal area including building installations and fire-protection systems, closure of the gap in the building between Halls A and B, and erecting an expansion building for Hall C to the east.
- A-West-pier: The building extends Terminal 1 by 800 meters in a westerly direction and hence expands the terminal area used by Lufthansa by a further 160,000 square meters. In future, up to seven long-haul aircraft including four A380 aircraft will be able to dock at the same time. Construction is scheduled to start in 2008.
- C/D link: The building complex connects Terminals 1 and 2 and will be provided with several new gates for A380 parking positions after completion, as well as retail areas. The link was opened in March 2008.
- A380 hangar: The first part of the hall – 140 meters long, 180 meters wide, 45 meters high – has already been erected and is being used for maintenance of wide-body aircraft. As soon as the second half has been completed, up to four A380 aircraft or six B 747-400 aircraft can be serviced here in parallel.
- Airrail Center: A large superstructure with a total area of 140,000 square meters is being constructed on the roof of the long-distance railway station. Offices and two hotels are some of the facilities being accommodated in the cigar-shaped building, which is 660 meters long.

A series of new construction and upgrading projects are also in the pipeline which will be subject to their own statutory approval procedures.

As the operating company of the airport, Fraport AG is committed to applying its environmental principles to further expansion and upgrading at the airport. The general objective is to achieve a high level of efficiency with minimum environmental impact. Apart from the concept and operation of the buildings and systems, this also affects the selection of construction materials, for which the following criteria are applicable:

- Positive impact on well-being and health.
- Minimum energy expenditure and construction without pollutants.
- Regeneration and recycling.
- Appropriateness of materials and resources.
- Short transport pathways, i.e. regional procurement of construction materials.

Actual facilities, facilities currently under construction and planned expansions at the FRA site



■ Facilities
 ■ Facilities/planned expansion
 ■ Under construction/planned

Safety and emergency management

Safety creates acceptance

The terrorist attacks on September 11, 2001 sharply raised the awareness of the general public and politicians to the issue of aviation and security. This heightened sensitivity has led to further tightening of security measures by airports and airlines. Security standards at Fraport Airport – including equipment, organization, and security training – have always been high. Nevertheless, improvements to security are carried out in this area as a regular part of routine activities due not least to the demands posed by increases in traffic volume and changes to technical regulations. Moreover, safety is a decisive factor when it comes to general acceptance of air traffic among the general population. In the meantime, there are more than 11,000 employees at Frankfurt Airport working in a range of different companies and government agencies who play a role in maintaining the integrity of airport security.

Airport security is mandated by the German Air Traffic Control Act (Luftverkehrsgesetz) and the German Air Security Act (Luftsicherheitsgesetz), which came into force on January 15, 2005. These acts regulate airport and airline security, including defense against external dangers, and the security obligations of airport operators and airline companies.

The importance of operational safety was further highlighted when the corresponding ICAO regulations were ratified in national law on January 5, 2007 and a security management system was established.

Airport Fire Department: on duty round the clock

The airport fire department has a wide range of responsibilities, including aircraft fire fighting and protection of buildings from fire, firefighting and fire prevention in buildings and technical installations, and fire prevention services (firefighting training center, maintenance of fire suppression equipment, and aircraft salvage and recovery). The fire department also handles incidents involving the transportation of dangerous goods and handling of hazardous materials, as well as issues related to water protection. There are currently more than 226 firefighters and 55 vehicles based at three fire stations to facilitate fast deployment in an emergency. The airport fire department has dedicated a fire simulation facility for training crews

to cope with different scenarios. The training facility is powered by propane gas and gives fire crews the opportunity to carry out training under conditions close to reality. It is no longer necessary to use extinguishing foam since this can be simulated by computer. Only water is used.

Equipped for emergencies

The ambulance and rescue services (medical services) are responsible for treating the sick and injured with first aid. Approximately 100 employees work in this area including Fraport's Head Emergency Physician and the Rescue Service Coordinator. The rescue service is integrated within the regional plan as an official service provider in the rescue service area of the city of Frankfurt Main. The medical services work closely together with the airport fire department, central fire command center in Frankfurt, external rescue services, and the city health authority in Frankfurt. In addition, the Emergency Crew and the Medical Support Team of the ground services are also available for support. These teams consist of volunteer employees who have been provided with appropriate medical training by the medical services. If necessary, airport security can be called on to provide additional security and transport support. Officers from the German Federal Police and the Hesse State Police are stationed at the airport and can also provide additional emergency support if needed.

Coordination of safety services

The activities of the airport security department, the fire department, and rescue services are coordinated by the Safety and Security Operations Center, which is staffed around the clock for emergencies. This command center monitors a large section of the airport premises with the aim of being able to tackle dangerous situations immediately. The equipment deployed includes more than 800 video cameras. In the event of a crisis, the Security Operations Center alerts the Emergency Response and Information Center (ERIC), the central control unit for crisis management at Frankfurt Airport. The team is made up of Fraport employees, the fire department, police, federal authorities, and other organizations. In a crisis situation, all available information can be quickly collected and analyzed. This allows key decisions to be taken virtually instantaneously.

Goals and perspectives

The emergency information center (NIZ) acts as a link between the organizations directly involved in the emergency, the family members of the people affected, and the authorities. It has a call center where the latest information technology is used to answer phone calls from relatives and to collect information. The 90 people working in the emergency information center have the support of the psychological counseling service for the relatives of the people involved and any other people involved in the emergency. 130 volunteers contribute to this service.

Safety verified by government and EU

Security, safety, and emergency management are regularly audited with the aim of ensuring that appropriate safety standards are maintained at Frankfurt Airport. The German supervisory agency carries out a complete audit at least every three years. The audit looks at safety and security at the airport, and includes airlines and federal agencies. Furthermore, EU civil aviation security regulation stipulates that random checks should be made by EU inspectors. In 2005 and 2006, an EU inspection was carried out at Frankfurt Airport in three stages. The International Civil Aviation Organization (ICAO) and the European Civil Aviation Conference (ECAC) have developed security audit systems for airports. These audits are currently voluntary since they are not yet enforced by law.

The EU is committed to continuous improvement of operational safety and security. The importance of this commitment will soon be further highlighted by the increasing competences of the EASA (European Aviation Safety Agency) in relation to airports.

Environmental goals and appropriate measures are presented as part of the environmental program. Attainment of these goals is continuously monitored by Fraport and documented in each Environmental Statement. Audits and environmental indicators are key instruments for evaluating current conditions and identifying opportunities to make improvements.

Environmental indicators

The following tables provide an overview and permit evaluation of Fraport AG's environmental impact in the course of the business processes that are relevant to the environment. Wherever possible, the most important information is presented in the form of indicators.

You will find these environmental indicators for the years 2006 and 2007 in the fold-out pages inside the front cover. Indicators prior to 2006 are provided in previous Environmental Statements.

Achievement of environmental goals from the Environmental Statement 2005





The key objectives and measures of Fraport AG for environmental protection are part of its Environmental Program, which is structured over a period of three years. Environmental planning and goal definition are based on the results of internal environmental audits and the assessment of general

environmental issues. Fraport AG set a number of measures and goals for the upcoming years in the 2005 Environmental Statement. The status of these goals is documented in the following table.

Achievement of environmental goals and measures from the Environmental Statement 2005

Sphere of Activity	Goal	Measure	Deadline	
Noise	Mitigate noise levels at night for residents by ensuring that a maximum noise level of 52dB(A) at the ear of the sleeper is not regularly exceeded. This applies to people sleeping in ventilated bedrooms with closed windows.	Implementation of a static noise-abatement program for residents within the defined night protection zone.	Period for application expired on April 26, 2006.	
	Enhance the transparency of aircraft noise.	Inspection of the newly-installed aircraft noise monitoring system by an independent auditor.	Mid-2006	
		Adjustment of reporting on the aircraft noise measurements to conform with the new German Aircraft Noise Act.	By the end of 2007	
		Improvement in website presentation of aircraft noise.	Mid-2006	
Air Pollutants	Improve air quality at the FRA site and surrounding areas (by reducing emissions per traffic unit*).	Replacement of the current stock of vehicles on the apron (mobile ground support equipment) by purchasing up-to-date models that comply with directive 2004/26/EC.	On-going	
		Supply three aircraft positions with 400 hertz stationary ground power.	By 4 th quarter, 2006	
		Development and updating departure management to reduce waiting times on the taxiways.	4 th quarter, 2006	

* A "Traffic Unit" (TU) is equivalent to a passenger with baggage (excluding transit passengers, according to ADV and ACI) or 100 kg of cargo or mail.

Key (Goal Achievement)		Goal achieved to > 90% to 100%
		Goal is still part of 2008 Environmental Program
		Goal partly achieved
		Goal not achieved

	Goal Achievement	Status of measures (May/June 2008)
	Goal 93% achieved (Measured value: Issued action plans and cost approvals)	<ul style="list-style-type: none"> • Requests submitted: 5,400 • Specifications and cost approvals: 5,000 requests for 13,000 households • Measures implemented by the applicant and reimbursed by Fraport: 4,050 applications with 8,300 residential units. <p>Cost reimbursement agreements were also granted for four schools, seven retirement and nursing homes for the elderly, and 15 nurseries.</p>
	Goal achieved	The review was carried out in the 2nd and 3rd quarters of 2007.
	Goal achieved	Evaluation according to energy equivalent continuous sound level Leq(3) will be carried out continuously from 2007.
	Goal largely achieved	The data relevant to aircraft noise are recorded every month from distribution of operations, route allocation and noise measurement. Comprehensive information on issues such as blocked runways, survey flights or the introduction of modified approach or take-off procedures is posted promptly on the Internet.
	Goal still applicable in 2008 Environmental Program	<p>The fleet of mobile ground support vehicles currently amounts to 963 units. 193 mobile ground support vehicles were purchased in the year 2007 in conformity with the directive 2004/26/EC or the latest status of the emissions standard. This is equivalent to a replacement rate of approx. 17% taking the increase in fleet size into account.</p> <p>The procurement of 159 mobile ground support vehicles has been introduced/launched for the year 2008. This is equivalent to a replacement rate of approx. 15% taking the increase in fleet size into account.</p>
	Goal achieved	The additional 3 parking positions in the cargo area have been operating since August 2007. The stationary ground power supply at the positions B 26 and B 46 has also been reinstalled after retrofitting the positions for the Airbus A380 has been finished.
	Goal slightly modified; still applicable in 2008 Environmental Program	<p>DMAN-FRA was used on a temporary basis in an initial operating phase during the course of 2007. The necessary adjustments to the procedures and systems are currently being implemented.</p> <p>A new launch is being planned in conjunction with A-CDM (Airport Collaborative Decision Making) in stages, currently scheduled from 2009.</p>

Achievement of environmental goals and measures from the Environmental Statement 2005

Sphere of Activity	Goal	Measure	Deadline	
Air Pollutants		Optimization of ground handling processes to avoid empty runs by developing and implementing new software (Plandis).	By the end of 2007	
		Utilization of fuel cell cars within framework of European Union's project "Zero Regio".	From the end of 2006, will take approx. 3 years	
Transportation	Increase the share of passengers using public transportation to 37.5% (ongoing target from 1999).	Supporting Lufthansa and German Rail (Deutsche Bahn AG, DB) in efforts to improve the services in the transport chain (flight check-in at railway stations, transportation of air-passenger baggage on ICE trains, integrated ticketing, establishment of 45-minute minimum connection time between trains and flights).	End of 2005	
	Reduce the number of employees traveling to work with their own vehicles.	Creation and testing of a new traffic concept (Carpool Club) for employees at FRA site.	From 2006	
Energy	Improve the efficiency of energy use. ¹⁾	Begin planning process to optimize the technological control centers in Terminal 1.	2005 to 2007	
		Remodeling the technological control center in Terminal 1.	Implemented starting 2007	
Water	Further reduce the consumption of drinking water in Terminal 1 by 15% by 2008.	Expanding the use of service water in Terminal 1 within the framework of upgrading the WC facilities.	End of 2007	
	¹⁾ The goal will be quantified during the project.			

Goal Achievement	Status of measures (May/June 2008)
Goal still applicable in 2008 Environmental Program	Implementation of the software tool "Plandis" was launched in January 2007. A prototype of the first level "Baggage transport" was also supplied. Implementation for baggage is planned for February 2009. Other prototypes were also supplied.
Goal still applicable in 2008 Environmental Program	Three vehicles are currently being used at the airport. The 4th vehicle was made available to Infraser Höchst. All three vehicles are regularly used at Fraport. Valuable experience was obtained on hydrogen logistics.
Goal achieved to 96% at the end of 2005	<p>In 2007, the share of passengers taking public transport (long-distance rail traffic, local rail traffic, buses) was 34%. The percentage of passengers using the ICE/IC network is currently 18% (2006: 17%). In 2007, around 7.13 million passengers were recorded in the two stations (+2.9%). 4.56 million long-distance passengers used the long-distance station (+7.2%), 2.57 million passengers used the regional station (-10%).</p> <p>The long-distance destinations were served by 175 trains each day in 2008 (+6%). This amounted to a total of 215 long-distance trains each day including the 40 long-distance/regional trains in the underground station. The grand total of trains passing through the airport each day, including the metropolitan railway (S-Bahn), amounted to 393 trains. Another airline (Qantas) was gained as a partner of DB in the DB code sharing during the course of 2007.</p> <p>The AIRail Service of Lufthansa was expanded in November (Bonn-Siegburg), the AIRail terminal in FRA were upgraded. All Cologne flights were transferred to rail.</p>
Goal still applicable in 2008 Environmental Program	Measures for acquiring employees in more than 580 companies at the FRA site started in April 2008. When the critical mass of 4,000 members has been generated, a mediation service can be launched. Fraport AG supports the project with promotional measures in the internal media, such as staff newspaper and Intranet.
Goal achieved	Stage 1 of project planning has been completed. The master specification is now available.
Goal still applicable in 2008 Environmental Program	<p>Individual modules from the master specification are now being moved forward in the planning phases of project stage 2 in conjunction with other upgrading and modernization projects.</p> <p>The priority measure relating to the ventilation center 4 is currently being realized and is scheduled for completion by the 2nd quarter of 2010 in accordance with the current plan.</p> <p>The measure for ventilation center 18 is currently being realized and is scheduled for completion by the 1st quarter of 2009 in accordance with the current plan.</p>
Goal achieved	<p>Effective from June 2008, the entire supply to wall hydrants (with the associated pipelines for WC installations) will be provided by with service water from substation 3 (approx. 6%). Effective from June 2008, service water will come onstream in buildings 205 and 206 (part of the complex T 1) (approx. 8%).</p> <p>By the end of 2008, other areas in T1 will be supplied with service water, e.g. LH Arrival Lounge B-001 322. (total 1%).</p>

Environmental Program 2008

The 2008 Environmental Program describes the most important goals that Fraport AG has set for Frankfurt Airport in the period between 2008 and 2011. The program also defines the measures for achieving the goals over the specified timeframe.

Environmental Program 2008			
Sphere of Activity	Goal	Measure	Deadline
Air pollutants and CO ₂	Improve air quality and reduce greenhouse gases at FRA site and the region per traffic unit	Replacement of the current stock of mobile ground support equipment by purchasing up-to-date models that comply with directive 2004/26/EC	Ongoing
		Optimization of ground handling processes to avoid empty runs by developing and implementing new software tools (Plandis project), in this case baggage transport	Starting in the 1 st quarter, 2009
		Testing deployment of fuel cell vehicles at Fraport within the framework of the European Union's project "Zero Regio"	By 4 th quarter, 2009
		Development of a monitoring system for the CO ₂ emissions from the arrival and departure of passengers and employees	By 2 nd quarter, 2011
	Reduce aircraft emissions in the LTO cycle by approximately two to four percent depending on pollutant	Reduction of aircraft taxiing and waiting times before take-off by at least 1 minute using the DMAN-FRA (Departure Management) software tool, which is being gradually implemented into the A-CDM (Airport Collaborative Decision Making)	Starting 2009
	Reduce CO ₂ -emissions at Fraport AG resulting from electricity production by 100% (approximately 185,000 tons a year by 2009, approximately 200,000 tons a year from 2010–2013)	Acquisition of electricity by Fraport AG from renewable energy sources	2008 until 2013
	Review of possible CO ₂ reduction by approx. 22,000 tons	Use of geothermal energy at Frankfurt Airport: <ul style="list-style-type: none"> • feasibility study • preliminary investigation program 	3 rd quarter, 2008 2 nd quarter, 2010
	Reduce CO ₂ by approx. 1,500 tons	Introduction of a regular rail link between FRA and Leipzig for transporting freight	Starting in 3 rd quarter, 2008

Environmental Program 2008			
Sphere of Activity	Goal	Measure	Deadline
Transportation	Reduce the number of employees using private transport to go to work at Frankfurt Airport	Trialing CARRIVA Carpool concept for employees at Frankfurt Airport	Starting in 4 th quarter, 2008
Energy	Improve energy efficiency	Renovation of the technical control centers in Terminal 1	2018
	Reduce energy consumption and the associated CO ₂ emissions:		
	• 1,800 MWh per year (approx. 400 tons of CO ₂ per year)	Upgrading of the central ventilation center 4	2007 to 2010
	• 6,600 MWh per year (approx. 2,000 tons of CO ₂ per year)	Upgrading of the central ventilation center 18/30	2008 to 2011
	Reduce approx 8,700 MWh per year (approx 5,000 tons of CO ₂)	Replacement of lighting	By 4 th quarter, 2010
Noise	Establish greater transparency for aircraft noise	Upgrading the noise monitoring system with monitoring stations that collect data from new or changed flight routes	Projected in 2010
		Annual calculation of aircraft noise contours in conformity with the regulations defined in the new Aircraft Noise Act (to be implemented) together with presentation of the relevant figures for people affected	Ongoing, projected to start in 2009
	Participate in the ongoing development of active noise abatement measures	Assessment of the proposed active noise abatement measures based on technical feasibility, and capacity and security issues	Starting in 2008
		Evaluation of the realistically achievable potential options for individual measures to achieve noise reduction and verification that they can be combined with other measures	
Water	Further reduce approx. 15% of drinking water consumption in Terminal 1	Creation of a service water concept and further expansion of service water use in Terminal 1	2 nd quarter, 2011

Long term goals and measures beyond 2011			
Sphere of Activity	Goal	Measure	Deadline
Air pollution and CO ₂	Reduce greenhouse gases and air pollutants	Expansion of the stationary 400 hertz ground power supply for the supply of aircraft and reduction of emissions generated by auxiliary power units	By 2020
Transportation	Increase the share of passengers using public transport to 38.9% by the end of the year 2020 (according to the Intraplan forecast for the expansion, G8 survey)	Supporting Lufthansa and German Rail (Deutsche Bahn AG, DB) in a drive to improve the services in the transport chain (flight check-in at railway stations, integrated ticketing, establishment of a 45-minute minimum connecting time between trains and flights at FRA site)	By the end of 2020
		Lobbying (Air Traffic for Germany Initiative) for the integration of air traffic into the national traffic route planning	
		Steering committee with German Rail (Deutsche Bahn AG, DB) and Lufthansa: integration of air traffic in the German Rail network and infrastructure planning	
		Bus study (Rhein-Main-Verkehrsverbund and other public transit networks) for medium-term improvement of bus links	
		Study on intermodal Frankfurt Airport traffic hub FRA 2030 (joint venture with Integrierter Verkehrsmanagement GmbH and Rhein-Main-Verkehrsverbund)	
Energy	Reduce energy consumption at Frankfurt Airport by:		By 2020
	20,000 MWh per year (equivalent to approx. 7,800 tons CO ₂)	Renovation of 71 buildings	
	350 MWh per year (equivalent to approx. 200 tons CO ₂)	Replacement of the motors for the baggage conveyor system	

Environmental GRI indicators

The Global Reporting Initiative (GRI) draws up guidelines for preparing sustainability reports. The chapters in the Environmental Statement 2008 with the key content relating to the protocol on environmental indicators are assigned to the aspects of the Sustainability Reporting Guidelines (Version G3) defined in the Global Reporting Initiative.

Environment Performance Indicators			
GRI	Aspect	Chapters in Environmental Report 2008	Page
EN 1 – EN 2	Materials	Environmental Information:	
		• Air quality (emissions and pollutant concentrations)	101
		• Waste management	126
		• Dangerous goods and hazardous materials	124
EN 3 – EN 7	Energy	Environmental Information:	
		• Energy	109
		• Climate protection	90
		• Goals and perspectives (environmental program)	131
		Environmental Dialog:	
		• Climate protection at the airport	16
		• High-tech for the terminal	32
		• Geothermal energy at Frankfurt Airport	62
EN 8 – EN 10	Water	Environmental Information:	
		• Drinking water and service water	120
EN 11 – EN 15	Biodiversity	Environmental Information:	
		• Biodiversity	118
		Environmental Dialog:	
		• Expansion with ecological perspective	52
		• Construction respecting people and nature	58
		• Where the natural wilderness returns	40
EN 16 – EN 20	Emissions	Environmental Information:	
		• Climate protection	90
		• Air quality (emissions and pollutant concentrations)	101
		• Goals and perspectives (environmental program)	131
		Environmental Dialog:	
		• Global – ecological - sustainable	12
		• Climate protection at the airport	16
		• Business model with environmental elements	24
		• Investments in sustainable environmental protection	28
		• Expansion with ecological perspective	52
EN 21, EN 25	Wastewater	Environmental Information:	
		• Wastewater	122
EN 22 – EN 24	Waste	Environmental Information:	
		• Waste management	126
EN 23	Significant releases	Environmental Dialog:	
		• Waste management at Frankfurt Airport	44
		Environmental Information:	
		• Waste management	126
		• Dangerous goods and hazardous materials	124
EN 26 – EN 27	Products and services	• Soil, contaminated areas and groundwater	123
		• Safety and emergency management	130
		Environmental Information:	
		• FRA and Fraport AG	85
		• Aircraft noise	112
EN 28	Compliance with statutory regulations	• Climate protection	90
		• Air quality (emissions and pollutant concentrations)	101
		• Goals and perspectives (environmental program)	131
		Rear coveragepage	U3
EN 29	Transport	• Validation (Implied element of EMAS validation)	
		Environmental Information:	
		• Climate protection	90
		• Air quality (emissions and pollutant concentrations)	101
		• Transportation	107
		• Energy	109
		• Aircraft noise	112

Additional information on environmental protection at Fraport

Information and transparency are key assets for successful environmental management which is geared toward open dialog and fair treatment of the interests of all those people impacted by the environmental effects of the airport. Providing information is a constituent element of the EMAS Directive. Fraport rises to the challenge of disseminating information on environmental protection by providing a number of different publications. These are placed in the public domain in the form of brochures and are also published on the Internet. This information service is complemented by various opportunities for discussion and dialog which are regularly organized by Fraport (e.g. by specific expert programs set up by Corporate Communications) or by third parties (e.g. in the Regional Dialog Forum).

Information hotline

If you have any inquiries or complaints about aircraft noise or airport expansion, please contact Fraport AG on the following telephone number (toll-free within Germany): +49 (0) 2345679.

Brochures and documentation

The following publications can be ordered from:
Fraport AG, UKM-IK, 60547 Frankfurt am Main, Germany.

- Additional copies of the *Environmental Statement 2008*
- The annual *Fraport Sustainability Report*, entitled Fairplay, which offers an informative overview of sustainable economic performance, environmental protection, and social responsibility.
- The *Fluglärmreport* (Aircraft Noise Report, only available in German) provides information on the aircraft noise situation in the vicinity of Frankfurt Airport. These can be ordered from: Fraport AG, FBA-R, 60547, Frankfurt am Main, Germany.
- The *Lufthygienische Jahresbericht* (Annual Air Quality Report, only available in German) documents the results of air quality monitoring at Frankfurt Airport. This can be ordered from: Fraport AG, FBA-RU, 60547 Frankfurt am Main, Germany.
- The brochure *Vom Abfall zum Rohstoff* (From Waste to Raw Material, only available in German) provides information on waste management at Germany's biggest airport.
- *Ausbau im Dialog* (Dialog on Expansion, only available in German) on the issue of expansion.
- *Facts and Figures* brochure with the most important facts and figures on the airport; also on CD-ROM.
- *Größer, leiser, sparsamer - Der A380 in Frankfurt* (Bigger, quieter, more cost-efficient, only available in German): on the issue of the Airbus A380 at Frankfurt Airport.
- *Von Frankfurt in die Welt* (Via Frankfurt Worldwide): Portrait of the Fraport Airport Group.

Internet

- The website www.fraport.com provides an informative overview of all the important issues relating to the Fraport Group: corporate development, environmental protection, job offers, business units, investor relations, Fraport worldwide, and much more.
- Pdf files of the Environmental Statement, the Sustainability Report, the Annual Report of Fraport AG, and other brochures providing information can be downloaded by clicking on www.fraport.de/cms/investor_relations/rubrik/20/20760.berichte.htm.
- Monthly figures on route allocation, distribution of operations, and aircraft noise monitoring can be accessed by clicking on www.fraport.de/cms/infoservice_fluglaerm/rubrik/2/2591.infoservice_fluglaerm.htm (only available in German).
- www.airportcity-frankfurt.de provides up-to-date travel and airport information for passengers and visitors to Frankfurt Airport.

Packages for visitors

Fraport AG offers anyone interested in the airport an opportunity to find out about the airport and specific issues at the airport location itself. A key issue is environmental protection. Environmental problems confronting the airport and solutions can be demonstrated in step with actual practice.

The Fraport Visitors' Service runs the popular airport tours. Individually-tailored programs are also provided for groups with a particular focus of interests. These tailored tours range from tours of special facilities to presentations and discussions on all aspects of environmental protection and management at Frankfurt Airport.

Contact

- Tour Booking Service for standard tours:
Telephone: +49 (0) 69 690-70291
Fax: +49 (0) 69 690-53341
- Written inquiries for specialist programs should be addressed to: Fraport AG, Unternehmenskommunikation, Besucherservice, 60547 Frankfurt am Main, Germany
- Email: erlebnisfahrten@fraport.de

The Airport Forum Information Center

The Airport Forum is located in the AIRail Terminal between Terminal 1 and the long-distance train station. The Airport Forum is a service for visitors and passengers at Frankfurt Airport. The main focus is to answer to any questions about the operation and expansion of the airport, including topics related to environmental protection and noise abatement. Interactive media give passengers and visitors an in-depth insight into all aspects of the airport. The Airport Forum also offers a venue for presentations and group discussions.

The Fraport Infobus

The Fraport Infobus operated by Fraport AG tours the surrounding region with the aim of updating local residents on Frankfurt Airport, the noise issue, and airport expansion plans. If you want information about the Infobus tour schedule, look in your local newspaper or go to www.ausbau.fraport.com.

GLOSSARY

ACARE Advisory Council for Aeronautics Research in Europe –

Established in 2001. The Council has delegates from the EU member states, the EU Commission, EUROCONTROL, the aerospace industry and research establishments, as well as representatives from airports, airlines, regulatory authorities, and universities. The goal is to establish and implement a Strategic Research Agenda (SRA) for the aeronautics industry. www.acare4europe.org

ACI Airports Council International – An international association of airports founded in 1991. The organization attempts to boost cooperation between airports, and it represents the airports and their interests, e.g. in international forums or in negotiations with governments. ACI is based in Geneva, Switzerland. It has over 1,530 member airports located in 175 countries and territories, 400 airports are within ACI Europe. www.aci-europe.org

ADV Arbeitsgemeinschaft Deutscher Verkehrsflughäfen – German Airports Association. An association for civil aviation in Germany, founded in 1947 in Stuttgart, to represent civil aviation in Germany. This association today represents airports in Germany, Austria, and Switzerland. www.adv.aero

Aircraft movement – Either a take-off or a landing

Aircraft noise monitoring system/Aircraft noise measurement system of Fraport AG at Frankfurt Airport – The measuring and monitoring system was launched in 1964 and has been continuously improved since then. Apart from recording the aircraft noise situation at each monitoring station, the system is also used for acoustic monitoring of specified flight routes and flight procedures. Our system currently has 26 fixed and three mobile measuring stations. It is the most comprehensive system in Europe and a benchmark for many other airports.

Airport charges – Regulate the airport, infrastructure and ground-services charges. Fraport airport charges have a component dependent on noise and emissions.

AlRail Terminal – Link between Terminal 1 and the long-distance train station. The Airport Forum, "T" Check-in and a range of shops are located there.

BARIG Board of Airline Representatives in Germany – Airlines with distribution or operational interests in Germany can become a member of this association. It currently has 104 members. www.barig.org

Biodiversity – The variety of all life on earth. Science distinguishes four aspects of diversity: genetic diversity, species diversity, diversity of ecosystems (e.g. the variation in habitats), and functional biodiversity (i.e. the variation in biological interactions).

BVU – Beratergruppe, Verkehr plus Umwelt GmbH – Advisory group on traffic and environment, Freiburg im Breisgau.

CDP Carbon Disclosure Project – Initiative that wants to introduce more transparency for the CO₂ emissions generated by major companies. More than 300 institutional investors across the world supported the project in 2007 in order to reduce the CO₂ emissions that cause damage to the climate. Together, they manage assets amounting to more than 41 trillion US dollars. This is the world's biggest initiative ever undertaken by the finance industry. It assesses the effects of global climate change on companies and analyzes their strategies. Fraport has been participating since 2006.

Chapter 4 aircraft – Aircraft which currently comply with the most stringent noise protection category – the chapter 4 noise standard. The Environmental Committee (CAEP) of the ICAO agreed on this in September 2001. This standard specifies that from 2006 all newly certified aircraft must go 10 decibels or more below the chapter 3 noise limits, accumulated over the defined measuring points. The noise limit values for aircraft were defined by the ICAO in Annex 16 of the Agreement on International Civil Aviation.

Decibel (A), dB(A) – Named after Alexander Graham Bell, the inventor of the telephone, the decibel defines sound pressure levels logarithmically. The sound pressure level characterizes the pressure ratio of a sound event to the human auditory threshold. dB(A) means that the frequency dependence of the human sense of hearing is taken account of during measurement by applying a filter. The sound pressure level defined as A has proved effective and has now been standardized internationally. Pursuant to the German Aircraft Noise Act (Fluglärmsgesetz), a change of 4 dB(A) represents a doubling or halving of the sound energy (see 'Equivalent continuous sound level'). An increase of 10 dB corresponds to a tenfold increase in sound intensity. A difference of 10 dB is equivalent to halving or doubling the perceived volume.

DFS Deutsche Flugsicherung GmbH – German Air Traffic Control. Its functions are regulated in accordance with the German Air Traffic Control Act (Luftverkehrsgesetz). They mainly comprise air-traffic control and acceptance, processing, and forwarding of flight plans. The DFS is also responsible for planning, setting up, and maintaining all the technical facilities necessary for these purposes, as well

as the radio navigation systems for aircraft. The DFS has joined forces with airports, airline companies and the aircraft noise commission to establish air safety procedures and measures to reduce aircraft noise. www.dfs.de

DJSI STOXX Dow Jones Sustainability Index – Standard for sustainable investment in Europe. It includes the top 20 percent of companies in the Dow Jones STOXX SM 600 Index based on sustainability criteria. The Index was published for the first time on October 15, 2001. Fraport has been included in the Index since September 18, 2006.

DJSI World Dow Jones Sustainability World Index – Lists those ten percent of companies in each sector where sustainable corporate management is exemplary. It was published for the first time on September 8, 1999. Fraport has been included in the Index since September 24, 2007.

DLR Deutsches Zentrum für Luft- und Raumfahrt – German Aerospace Center with extensive research and development projects in national and international joint ventures. These include research with goals for reducing aircraft noise. www.dlr.de

EMAS European Eco-Management and Audit Scheme – A voluntary environmental instrument for companies and organizations with the goal of continuously reducing environmental impacts. Organizations which apply the EMAS Process are listed in a public register. They are identified by the EMAS logo. EMAS organizations verifiably comply with the legal regulations relevant to the environment, maintain a management and auditing system which allows them to continuously reduce environmental impacts, and periodically draw up an Environmental Statement which puts achievements in environmental protection in the public domain. The Environmental Statement presents the environmental balance sheet for the organization. It is therefore audited by an environmental auditor and confirmed if it fulfills EMAS requirements. EMAS therefore represents performance, credibility, and transparency. EMAS is published in the Official Gazette of the EC No. L 114 p.1 ff. as Directive (EC) No. 761/2001 of the European Parliament and Council dated March 19, 2001.

Emissions – All (solid, gaseous, liquid, or odor disseminating) substances, wave radiation or particle radiation emitted from systems and plants, vehicles, products, materials, or other sources (for example aircraft) which exert an impact on the surrounding environment.

Energy equivalent continuous sound level Leq(3) – The sound level which a steady continuous noise would need to have in order to supply the same sound energy as the different individual noises actually occurring during a defined time period. The Leq(3) is a standard international noise measurement with the halving parameter $q=3$. The halving parameter $q=3$ effectively means that if the aircraft mix remains identical and the number of planes flying past a monitoring station doubles, the continuous sound level increases by 3 dB. If the number of aircraft movements halves, the continuous sound level comes down by 3 dB. Pursuant to the new German Aircraft Noise Act (Fluglärmsgesetz), the continuous sound levels Leq(3) should be calculated separately for day and night in the six months of a year with the highest traffic volumes.

Environmental auditor – natural or legal person who is granted the right under the German Environmental Audit Law (Umwelt-auditgesetz) to confirm that organizations (industrial companies, service companies, or other institutions) are in conformity with the requirements of the European Eco-Management and Audit Scheme. Environmental auditors/organizations are subject to a special authorization procedure.

Environmental Statement – According to EMAS, an Environmental Statement must be drawn up regularly and placed in the public domain. This statement describes the organization together with its activities, products and services. The in-house Environmental Policy, the key environmental effects, and the environmental program are presented together with the concrete goals for improving operational environmental protection. Data on environmental performance is also provided, ideally in the form of figures accompanied by an assessment. Each Environmental Statement must be verified by an independent, nationally accredited environmental auditor. If it meets the requirements of the EMAS Directive, the environmental auditor declares that the Environmental Declaration is valid (validation). The Environmental Declaration is made available to the public as a printed document or in electronic form. It forms the cornerstone of the dialog between companies and any interested parties.

Equivalent continuous sound level (Leq) – is a measure of the mean value as a function of time for all sound pressure levels within a stated observation period. All sound events varying in strength and duration are summarized in conformity with a defined calculation specification. The resulting mean value is an acknowledged and proven measure for the "amount of noise" occurring during a defined period of time.

GLOSSARY

Equivalent continuous sound level Leq(4) – is an average level which was applied after the German Aircraft Noise Act (Fluglärmsgesetz) came into force in 1971. It is based on the halving parameter $q=4$. At the time, the choice of the parameter $q=4$ was based on studies which showed that halving the duration of the noise or the frequency of the noise is equivalent to a reduction of the maximum level by $q=4$ dB as far as the effect of the disturbance is concerned. In the case of Leq(4) according to the old Aircraft Noise Act, a continuous noise level was identified for the 24 hours of the day, with day and night aircraft movements being factored in with different weighting factors.

Fraport AG – Germany's largest airport group.

FTSE4Good – Index launched by the Financial Times and the London Stock Exchange in 2001. Companies are listed in the FTSE4Good only if they demonstrate above-average performance in the fields of human rights, social standards, and environmental protection. Fraport has been included in the index since March 17, 2006.

Global Compact – Global network in which the United Nations works together with private companies and non-governmental organizations to promote human rights, standards in labor relations, environmental protection and combating corruption. Fraport has been part of the Global Compact since September 2007. The Global Compact has some 4,000 members worldwide, and 84 global companies in Germany have now joined the Global Compact. www.unglobalcompact.org

HLUG – Hessisches Landesamt für Umwelt und Geologie – Hessian Agency for the Environment and Geology.

IATA International Air Transport Association – www.iataonline.com

ICAO International Civil Aviation Organization – A body of the United Nations. It is charged with establishing uniform standards for aviation safety, security, continuity and efficiency and developing them on an ongoing basis. www.icao.int

ICAO, Annex 16 – The ICAO issued a standard for limiting the sound emitted by civil aircraft in 1971: Annex 16 to the Agreement on International Civil Aviation. When aircraft are newly licensed, proof must be provided that they are in conformity with the latest requirements defined in the Annex.

Impacts – Effects of noises (sound or noise emissions), air pollutants (air emissions), vibrations (vibration emissions) and heat (heat emissions) on the environment.

Initiative Luftverkehr für Deutschland – German Air Transport Industry Initiative – Under the auspices of the German Minister for Transport, Construction, and Urban Development, German Air Traffic Control (DFS Deutsche Flugsicherung GmbH), Munich Airport (Flughafen München GmbH), Fraport AG, and Deutsche Lufthansa AG joined forces to set up this initiative. Other German ministries and federal states, and the German aviation associations Federal Association of German Airlines (Bundesverband der Deutschen Fluggesellschaften, BDF) and the Taskforce of German Airports (Arbeitsgemeinschaft Deutscher Verkehrsflughäfen, ADV) have also joined the initiative. The aim of the initiators is to stabilize the economic foundation of aviation in Germany and to establish the strategic direction with a view to creating a strong position for German airlines in global competition. Established in July 2003. www.initiative-luftverkehr.de

Intermodality – Traffic system with at least two carriers integrated in a transport chain in order to convey people from place to place – e.g. rail and aircraft. A global approach means that all the available transport capacities can be deployed more effectively.

IPCC Intergovernmental Panel on Climate Change – The inter-governmental UN panel of experts was set up in 1988 by the World Meteorological Organization (WMO) and the environment program of the United Nations. www.ipcc.ch

ISO International Organization for Standardization.

ISO 14001 – International environmental management standard defines globally recognized standards for environmental management. It allows companies to establish environmental protection systematically within their internal structures. www.iso.org

Kyoto Protocol – Defines binding targets for reducing the emission of greenhouse gases. It was adopted in 1997 as an additional agreement linked to the United Nations Framework Convention on Climate Change and came into force in February 2005. The agreement expires in 2012.

Long-distance train station – opened in 1999. This provides our direct link to the high-speed European rail network and represents a key factor for the ongoing development of our intermodality, i.e. networking different transport systems. FRA has a second station under Terminal 1 – the regional station – for the rapid-transit railway (S-Bahn) and regional trains.

Operational direction – The operational direction of an airport depends on the prevailing direction of the wind: aircraft only take off and land against the wind. FRA has the operational directions 25 (this corresponds to 250 degrees on the compass rose, i.e. west wind) and 07 (east wind). Because winds in a westerly direction occur for 75 percent of the time, the operational direction 25 is flown correspondingly more frequently.

Sustainability – The concept of sustainability has for some years been a guiding principle for the future-proof or sustainable development of humanity. This kind of development meets the needs of the people living on the planet at present without compromising the capacity of future generations to satisfy their needs.

Sustainability Yearbook – SAM Group and accounting firm PricewaterhouseCoopers included Fraport AG in the Sustainability Yearbook 2008 for the first time on the occasion of the World Economic Forum in Davos. Only 15 percent of the companies assessed make it into the yearbook.

SES Single European Sky – Uniform European airspace. The initiative by the European Union will optimize traffic flows, standardize flight controllers' licenses, harmonize technology, and hence maintain safety, capacity, and punctuality in an environment where air traffic is increasing.

TU Traffic Unit – Equivalent to a passenger with baggage (excluding transit passengers, according to ADV and ACI) or 100 kg cargo or mail. Transit passengers are people who do not leave the aircraft (<1% of all passengers). ADV = German Airports Association, ACI = Airports Council International.

VOC Volatile Organic Compounds – Compounds with a high vapor pressure which easily evaporate into the atmosphere at room temperature. VOC's are present in fuels and other substances. Volatile organic compounds contribute to the formation of ozone under the influence of nitrogen oxides and intensive sunlight.

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The next two abridged Environmental Statements are due to be published in June 2009 and June 2010. The next validation will take place in June 2011.

The official German version of the Environmental Statement has been validated by:
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Validation Statement

The Environmental Management System of Fraport AG comprising environmental policies, environmental objectives and programs, the procedures defined in the Eco-Management and Audit Scheme (EMAS) and the Environmental Statement – for the location Frankfurt Airport – are in conformity with (EEC) No. 761/2001.

The facts and figures presented in the Environmental Statement give a fair and accurate picture of the environmental relevance of all on-site activities.

Frankfurt, June 4, 2008

A handwritten signature in black ink, appearing to read 'B. Kühnemann', is written over a light gray rectangular background.

Dr. Burkhard Kühnemann
Environmental Auditor D-V-0103

Environmental auditor

The authorized independent environmental auditor is from the environmental organization Insitut für Umwelttechnik Dr. Kühnemann and Partner.

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Schedule

The next abridged environmental statement will be validated and published in June 2009.

