Copenhagen Airports CPH

Management's statement

Copenhagen Airport reached the 19-million-passenger mark in 2004 and thus retained its position as the largest airport in Scandinavia. The number of passengers was up 7.5% year-on-year. The number of aircraft operations rose 5% during the period from 259,002 in 2003 to 272,519 in 2004.

Based on our environmental policy establishing that, as an environmentally responsible company, Copenhagen Airports A/S (CPH) is operated and developed with a view to continually improving its environmental performance, it is important to assess the effect of the growth in passenger numbers and aircraft operations from an environmental point of view. We believe that, generally, the environmental parameters affected by number of passengers and aircraft operations did not increase more than traffic.

The most apparent environmental impact from the airport's aircraft activities is noise in the residential areas in the vicinity of Copenhagen Airport. CPH constantly monitors developments in noise impact and implements measures to limit the noise. Monitoring data show that recent years' significant fall in noise impact was replaced by a minor increase in 2004. The increase was roughly equivalent to the increase in the number of aircraft operations. The noise impact remains well below the noise requirements stipulated in our environmental approval, and which had to be met from 1 January 2005.

The environmental approval reduces the maximum night-period noise level for the residential areas neighbouring Copenhagen Airport effective from 1 January 2005. All night flights out of Copenhagen Airport are subject to an approval procedure to ensure that the noise limit is observed. CPH´s noise monitoring system logs all noise events exceeding the limit so that the aviation authorities can assess whether the noise limiting provisions in the aviation legislation have been observed.

In 2002, CPH adopted an energy policy aimed at promoting energy saving initiatives and improving energy efficiency in general. In 2004, our consumption of electricity, heating and water increased slightly year-on-year. The increase was less than the growing passenger numbers though. Consumption of heating showed a slight increase in 2004, primarily because the area heated was larger than in 2003. The consumption of water and electricity has increased due to the increase in passenger numbers.

Within occupational health and safety, an area of special focus in 2004 was the number of industrial accidents, the frequency of which fell from 14 per million working hours in 2003 to 10 in 2004. This substantial reduction was achieved by various measures such as the greater focus on the physical conditions in the workplace and planning of work in combination with an open dialogue about the occupational health and safety, this contributed to behavioural change among our employees.

This Environmental Report has been reviewed by external auditors and includes their statement on the review.

Copenhagen, 3 March 2005

Peter Rasmussen
Senior Vice President

COPENHAGEN AIRPORTS A/S

ENVIRONMENTAL REPORT 2004

COPENHAGEN CPH 2004

Copenhagen Airports CPH

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Environment at CPH

The environmental impact of an airport

The special characteristics of an airport is the union of passengers and aircraft. This union releases a chain of activities that may affect the environment.

Aircraft arriving at the airport emit noise and affect air quality. Once an aircraft is parked at a stand, it needs to be disembarked of passengers, deloaded of baggage and cargo and then cleaned. While the aircraft is being prepared for the next departure, an entire range of activities takes place. Several facilities, including maintenance and engine testing units, are used to carry out these activities.

Prior to departure, passengers board the aircraft, baggage is loaded, and the aircraft is fuelled. Under certain meteorological conditions, it is necessary to de-ice the aircraft before takeoff, since ice formation on the aircraft has an impact on manoeuvrability and increases the weight of the aircraft. The aircraft activities may involve noise and impact on air quality, soil and water.

Maintenance of the three runways, aprons and other airport areas requires a series of activities that have an impact on the environment. The runway system must be maintained and cleared of ice and snow in the winter. Grass-covered areas must be nursed and pavements must be cleaned.

The airport also has numerous technical plants that may affect the environment. These plants include storage for aircraft fuel, aircraft maintenance, energy supply for runway lighting and a location for fire drills. The runway activities can impact on air, soil and water quality.

The terminals are the hub of a series of activities which take place between the time passengers arrive and depart. The servicing of airport passengers involves consumption of energy and water in the three terminals. The terminal activities also produce waste water and waste that needs to be disposed.

At the same time, the airport activities create jobs and thereby contribute greatly to society. Copenhagen Airport has major local and regional importance due to the number of jobs resulting directly and indirectly from the activities of the airport. About 22,000 people work in the many companies operating in the airport.

Environmental work

CPH is listed on the Copenhagen Stock Exchange and owns and operates airports in Copenhagen and Roskilde. CPH makes infrastructure, buildings and service facilities available to the many companies operating their businesses at the airports.

In addition to the impact of CPH's activities, the environment around the airport is also affected by the activities of the other companies, in particular by air traffic. In accordance with CPH's environmental approvals, CPH monitors parts of these impacts, primarily noise and air quality. The responsibility, however, rests with the individual company. The monitoring results of CPH are reported to the environmental and civil aviation authorities, and these authorities carry out further procedures with the individual companies.

CPH's environmental policy provides the general framework for environmental attention as an integrated part of the company's operations.

The environmental policy establishes that as an environmentally responsible company, CPH is operated and developed with a view to continually improving environmental performance.

These results must be achieved through constant attention to environmental aspects in all decisions, by taking preventive action and using cleaner technology, through increased environmental awareness among employees and business partners, and through an open dialogue about the company's environmental impact.

The environmental impact of CPH's airports at Copenhagen and Roskilde is regulated by the environmental authorities through terms established in environmental approvals. The most important approvals are the overall approval from the Danish Environmental Protection Agency with respect to noise and air pollution in connection with air traffic and the Copenhagen County environmental approval of other activities.

The approvals were granted on the basis of a 1997 environmental impact assessment (EIA) of the expansion of Copenhagen Airport and include requirements to operations and future expansion of the airport.

The 1997 overall approval by the Environmental Protection Agency was appealed to the Environmental Appeal Board, but in May 1999 the Board upheld the approval with minor adjustments. The Copenhagen County's environmental approval of remaining activities is from 1997.

The individual organisational units at CPH are responsible for observing the environmental approvals and current legislation. CPH's environmental division provides consultancy, takes care of the contact to environmental authorities, and coordinates internal control measures at the airports.

During the preparation of the EIA report, the most important environmental impacts of the activities at Copenhagen Airport were mapped and their consequences analysed. Based on this, CPH prepared a series of action plans that have been implemented gradually. CPH monitors developments in its environmental impact closely with a view to implementing corrections if necessary.

Developments in the environmental impact are described on the following pages. A table at the back of this report shows the environmental data over a five-year period.

Relationship between CPH and the other companies at the airport

Aircraft activities	Runway activities	Terminal activities
Takeoff and landing, aircraft taxiing to terminals. De-icing, wash and aircraft maintenance. Catering and cargo.	Maintenance of runways, aprons and other areas, including snow clearance.	Passenger activities in the terminal area, including restaurants, shops, toilets and offices.
Input	**Input**	**Input**
Glycol for aircraft de-icing	Runway de-icing agents	Water for passenger areas
Aircraft fuel	Electricity for lighting	Electricity and heating for passenger areas
Water	Herbicides	Water for restaurants, shops, etc.
Electricity and heating	Fuel for CPH's vehicles	Electricity and heating for restaurants, shops, etc.
	Fuel for other vehicles	
Output	**Output**	**Output**
Waste water	Surface water	Wastewater
Collected glycol	Waste	Waste
Noise	Air quality	Air quality
Air quality		
Oil and fuel spills		
Waste		

■ CPH's responsibility ■ CPH monitors and controls ■ Responsibility of lessees and operators

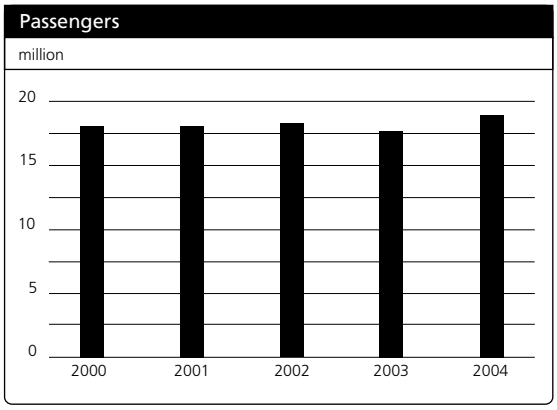
Environmental impact of aircraft activities at Copenhagen Airport

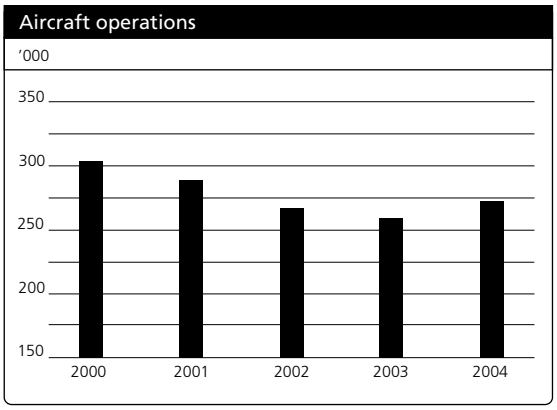
Noise

Noise in the neighbouring areas from aircraft taking off and landing is one of the most significant factors of environmental impact from an airport. Also noise from aircraft on the ground affects the residential areas neighbouring Copenhagen Airport. The noise from the airport activities is constantly monitored, and measures are regularly introduced to limit the impact of noise in the areas around the airport.

In the environmental approval of Copenhagen Airport, the environmental authorities stipulated that the environmental impact from air traffic must have been reduced by about 5 dB by 2005 relative to the 1996 level. To determine whether this is achieved, a so-called TDENL value (Total Day-Evening-Night Level) is calculated every year to describe the total noise impact for air traffic at the airport.

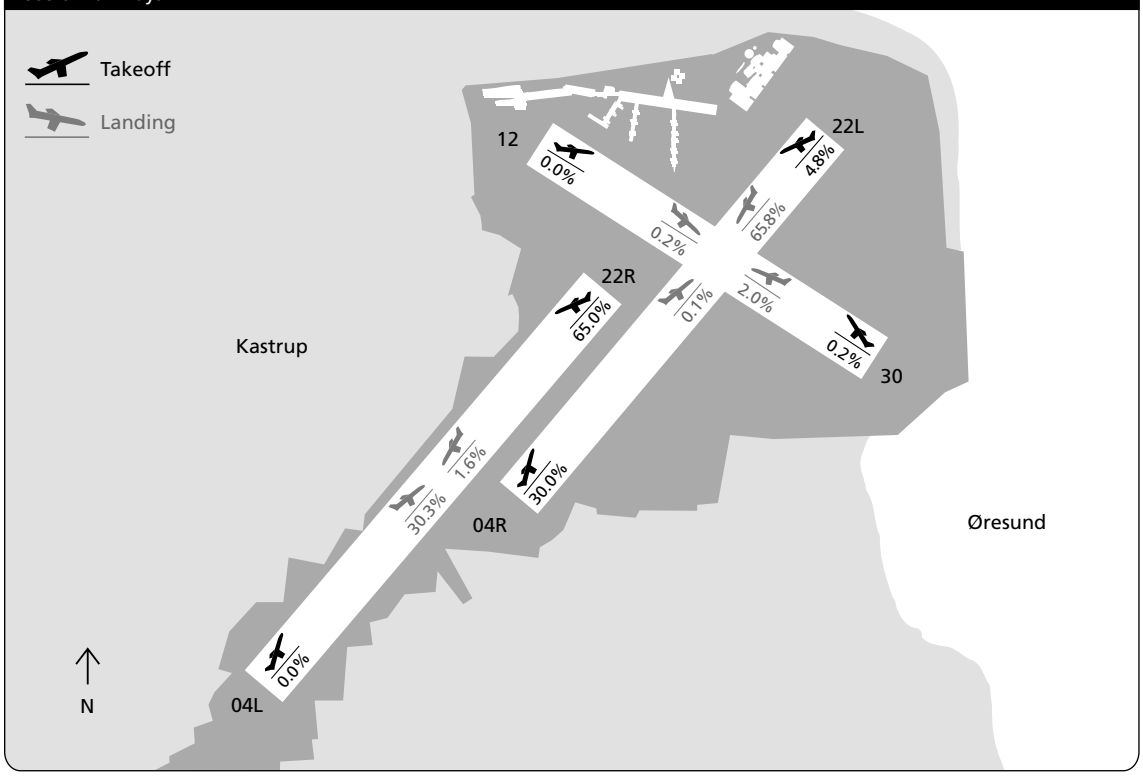
Recent year's significant fall in noise impact was replaced by a minor increase in 2004. In 2004, the noise impact calculated according to the TDENL method increased by 0.3 dB compared with the 2003 level. The main reason for this increase was a 5% increase in the number of aircraft operations from 259,002 in 2003 to 272,518 in 2004. A change in the noise impact by 0.3 dB is roughly equivalent to a 7% change in sound energy. The airlines did not continue recent years' phase-out of their most noisy aircraft in 2004.





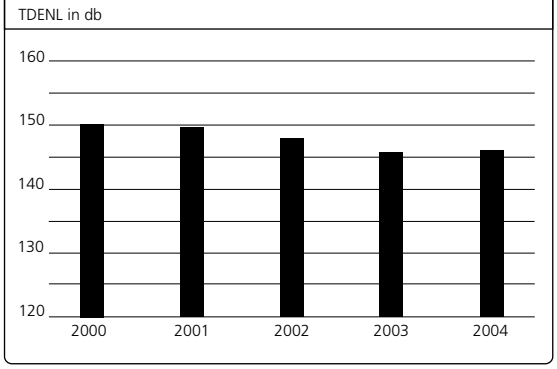
The runway system at Copenhagen Airport consists of two parallel main runways (04L-22R and 04R-22L) and a cross runway (12-30). The regulations for runway use specify that, whenever possible, aircraft should avoid passing over residential areas, and the cross runway is therefore only used when necessary due to special wind and weather conditions. For safety reasons, takeoffs and landings are performed upwind. The choice of runway for takeoffs and landings has a major influence on the noise impact in the residential areas around the airport. As in 2003, the cross runway, with takeoffs on runway 12 and landings on runway 30, was used significantly less in 2004 than in a normal year. Especially, runway 12 was used very little, which brought the noise impact on the residential areas to the north-west and south of the airport to below normal. Seen over a ten-year period, the 2004 distribution of traffic on the runway system did not differ from the normal pattern.

Use of runways



Takeoffs and landings during the night period (23:00-06:00) are subject to restrictions not to exceed a maximum A-weighted noise level of 85 dB at 6 measuring points located in the residential areas neighbouring the airport. All planned night flights out of Copenhagen Airport are subject to an approval procedure to ensure that the maximum level is observed. The airport noise monitoring system logs all noise events exceeding 85 dB. Noise events logged are reviewed by the Danish aviation authorities to determine in each event whether the aviation legislation was observed. In 2004, 4 noise events were found to exceed 85 dB, the lowest such number in the about 20 years these regulations have been in force. As from 1 January 2005, the maximum noise level from takeoffs and landings during the night period has been reduced from 85 dB to 80 dB.

Noise impact



Aircraft engines are tested in connection with repairs and maintenance of aircraft. In order to minimise the nuisance from this, provisions have been introduced allowing engine run-ups when necessary for the punctual execution of planned departures, but with the greatest possible consideration for the environment. Engine run-ups must be carried out in designated areas and cannot take place between 23:00 and 05:00. In 2004, engine testing occurred 1,465 times, including 770 instances of engine run-up and 695 instances of engine idle-run. The number of engine testing instances was about 8% lower than in 2003; the number of engine run-ups (at a higher effect than idle-run) was largely unchanged. The number of infringements reported to the environmental authorities was higher than in 2003. 10 incidents were reported to the authorities, equal to 0.7% of all engine tests; the corresponding figure for 2003 was 6 incidents, equal to 0.4% of engine tests that year.

Night period maximum noise levels from takeoff and landing

		2000	2001	2002	2003	2004
86 dB(A)	number of noise events	2	7	5	2	3
87 dB(A)	number of noise events	2	2	0	2	0
88 dB(A)	number of noise events	1	1	1	0	1
89 dB(A)	number of noise events	3	2	0	2	0
90 dB(A)	number of noise events	0	1	0	1	0
>90 dB(A)	number of noise events	0	0	2	0	0

Air quality

CPH has monitored the air quality around the airport since 2000 using three monitoring stations east and west of the terminal area and near the airport south gate. The purpose of the two northern measuring stations is to enable CPH to assess how much the air is polluted when it passes over the terminal area, as previous studies have shown that the highest pollution levels are around that area. The third monitoring station is located where the impact from the airport is lowest.

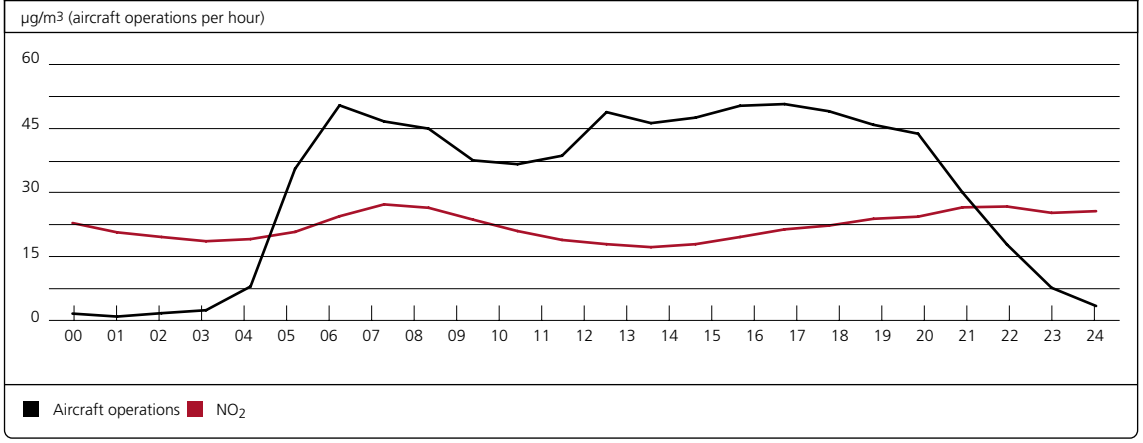
Each monitoring station measures nitrogen oxide (NO), nitrogen dioxide (NO_2), sulphur dioxide (SO_2), ozone (O_3), particular matter ($PM_{2.5}$ in the north area and PM_{10} in the south area), toluene and benzene. In this Environmental Report, CPH focuses on the parameters with the greatest local impact, and which are comparable with other measurements of air quality.

A more detailed analysis of the measurements has been made earlier to determine how much pollution the airport contributes immediately outside the perimeter fence. The analysis showed that there is no direct correlation between the operation of individual flights and the air quality around the airport. As shown in the figure with data from 2004, the average concentration of NO_2 does not vary with the number of aircraft operations over a 24-hour period. The 24-hour variation in NO_2 is more comparable to the variation in car traffic in Copenhagen and the surrounding road system.

However, the analysis also showed that the airport can be considered a significant source of air pollution immediately around the airport with respect to the pollution component NO_2. When the wind comes from an easterly direction, the airport contributes about half the NO_2 concentration immediately west of the terminal area. However, it should also be noted that the concentration of NO_2 west of the terminal area is higher during westerly winds than during easterly winds. This shows that there are greater sources of NO_2 pollution in the area to the west of the airport than in the airport area. There are no indications that this has changed since 2001.

The measurements in 2004 showed that NO_2 in the north-western area of the airport is about half of the limit values. There have been no major variations in the annual mean value of NO_2 over the past four years. The measurements of NO show a constant fall since 2001. This correlates well with measurements in other urban areas in Denmark, which have also shown reductions in NO since the early 1990s. The fall is mainly the result of the phase-out of cars without catalytic converters.

NO_2 relative to aircraft operations



The concentration of PM_{10} in 2004 was below the 2002 and 2003 levels but higher than in 2001. The levels are believed to be close to the background level in Denmark.

The generally good air quality around the airport is partly due to the open, flat area, which provides good potential for quick mix/dilution of pollution. Moreover, aircraft – by far the greatest source of pollution – make emission at an altitude where the impact on air quality at the ground level is reduced substantially by dilution.

In cooperation with the Danish National Environmental Research Institute, CPH in 2003 carried out a survey of odour problems from air traffic. The results of the survey were sent to the Danish Environmental Protection Agency in late 2003. This did not give rise to further follow-up in 2004.

Oil and fuel spills

Aircraft fuel is stored in tanks at the fuel storage facility, which is operated by a business named Brændstoflageret, Københavns Lufthavn I/S. The total storage capacity is 4,140 m^3. Brændstoflageret receives jet fuel via an underground pipeline from its own pumping station at Prøvestenen. From the storage tanks, the jet fuel is distributed to aircraft stands primarily via pipelines to pit wells, from which aircraft can be fuelled by a hose. In 2004, about 127,000 fuelling operations involving a total of 935 million litres of fuel took place at Copenhagen Airport.

Despite great care, spills are unavoidable. CPH cleans all oil and fuel spills occurring when aircraft and vehicles are refuelled. Due to fire safety, fuel spills are washed away to the sewer system, and the fuel is collected in the nearest fuel separator. Oil spills are typically cleaned using an absorbing material combined with subsequent washing with soapy water that is applied and collected.

The spills are logged in connection with cleaning, in order to establish the total volume and number of such events.

A total of 217 spills were logged in 2004, and the spills involved an aggregate volume of 39,279 litres, compared with 289 spills and an aggregate volume of 3,008 litres in 2003.

The number of spills declined in 2004, mainly spills involving less than 50 litres. Conversely, the number of spills of 50 litres and above increased from 10 to 17.

In terms of volume, a significant increase was recorded. This was due to two accidents, which involved spills of 1,500 litres and 35,000 litres of fuel. The spills occurred in areas with leak-tight surfaces, and pollution of the surrounding grass-covered areas could therefore be prevented through rapid intervention, among other things by sucking up the fuel spilled.

The 217 spills can be divided into 89 fuel spills involving a total of 1,577 litres, and 128 oil spills (hydraulic and engine oil) involving 1,202 litres. The total volume and number of spills should be seen in relation to the total consumption of about 935 million litres of fuel. Besides the two major accidents, the fuel spills were at the same level as in 2003: 1 litre per about 600,000 litres of fuel used.

Aircraft de-icing

During the winter season, ice formation on the aircraft must be removed and prevented in connection with takeoff. Ice affects the manoeuvrability of aircraft, and there are worst-case examples of ice being sucked into the jet engines. In addition to meteorological conditions, fuel at below-zero temperatures in aircraft tanks may also cause ice formation on the aircraft. Ice is removed by spraying the aircraft with a mixture of hot water and glycol. This process is called de-icing.

Copenhagen Airport has established three de-icing platforms. Any excess de-icer that drips down on the platform as well as any precipitation is collected in tanks. The liquid collected is transported to purification and biogas plants at locations on Zealand. Glycol mixture in very low concentrations is collected in some cases. Copenhagen Airport has environmental approval to spread this in a specially approved area of the airport provided that the concentration of glycol is below 5%. The concentration of the mixture spread out in 2004 was 1-2%.

Soil samples taken in the area where the mixture was spread show that the glycol is biodegradable and that there were neither glycol nor decomposed products in the soil after the end of the de-icing season. The volume spread on the area was 21 m^3 in 2004 or less than 6% of the total volume collected.

The annual consumption of glycol has been between 294 m^3 and 763 m^3 over the past five years. The volume used in 2004 was 530 m^3 of 100% glycol, and the volume collected was 373 m^3. In the past four years, collection rates, which among other things depends on the weather situation, ranged between 50% and 70%. The collection rate for 2004 was 70%.

It is also possible to carry out preventive de-icing, in which case aircraft are sprayed with glycol while parked on the stand. This is typically done when aircraft are parked overnight on a stand during periods with risk of ice formation. The quantity of glycol used for this type of de-icing is very low: about 6 litres. The total volume of glycol for preventive de-icing in 2004 was 3.6 m^3.

Environmental impact of runway activities at Copenhagen Airport

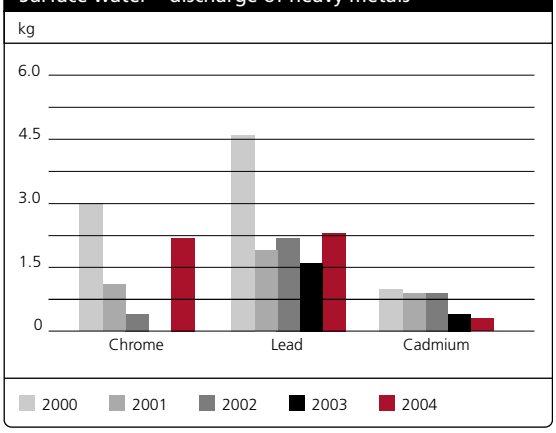
Surface water

An efficient drainage system ensures that the airport area is not flooded. The runway area, in particular, is a low-lying area, and it is therefore necessary to have large rain water pools to collect rain water from heavy showers. There are 12 outlets from the airport into the Øresund. The largest contribution of surface water comes from the terminal area, where most of the areas are paved.

The volume of water discharged increased to 3,545,565 m^3 in 2004 from 2,736,071 m^3 in 2003. The main reason for the increase was the substantially higher volume of precipitation in 2004 relative to 2003. Moreover, the paved area was expanded in connection with the establishment of the coastal road between Dragør and Taarnby.

Water quality is monitored by analysing 24-hour samples, which are taken periodically from all outlets. The main activities contributing environmentally hazardous substances are oil and fuel spills and de-icing of aircraft, runways and aircraft stands.

Surface water – discharge of heavy metals



The largest fluctuations in 2004 were seen in the volumes of oxygen consuming substances, nitrogen and fuel. A significant drop was seen in the content of oxygen consuming substances, whilst the content of nitrogen and fuel increased. As regards the volume of nitrogen, the increase was caused by the fact that use of sand/urea doubled in 2004. One of the reasons for the increase in fuel content was two major fuel handling accidents in 2004.

The content of heavy metals has been reduced significantly over the years, and measurements showed lower or unchanged levels of all metals again in 2004. The reduction was primarily achieved because a requirement was implemented in 2004 that aircraft wash water must be collected, to the effect that all wash water must be purified or transported to an external recipient.

Runway de-icing

The consumption of runway de-icers depends on the meteorological conditions. The special weather conditions requiring de-icing of the runways occur when temperatures are around zero. It is very important to get the balance of de-icers correct in these situations. The weather situation is monitored throughout the winter period using the airport's ice-warning system, and preventive de-icing is carried out if there is a risk of snow, sleet or glaze.

Liquid and solid formiate is used for runway and taxiway de-icing. In addition, sand mixed with a maximum of 5% urea is used to prevent slip and fall accidents in the stand area where handling staff work. In 2004, 1,093 tonnes of formiate and 55 tonnes of sand/urea mix was used, which was more than in the winter season of 2003, when the consumption was 924 tonnes of formiate and 28 tonnes of sand/urea mix. The increase was solely due to weather conditions.

Salt was previously used in front of the terminals to prevent slippery conditions. However, salt is harmful to plants, and calcium magnesium acetate (CMA) was therefore used on a test basis in 2004. A total of 50 tonnes of CMA was spread in the area in 2004.

Fuel consumption

Most of the vehicles used at the airport use diesel. Diesel is mainly used for vehicles for area maintenance, including de-icing and cleaning of runways and taxiways. Consumption therefore depends greatly on how much the snow clearing equipment is used.

Diesel is also used for a number of backup power plants which supply emergency power for runway lighting and other vital facilities in order to continue the smooth operation of air traffic if the public power supply is interrupted.

Based on experience from a large power blackout in 2003, the airport has decided to establish 3 new diesel plants. These plants will be established in early 2005 and will be located in the northern part of the airport.

Fuel plants in the northern and western sections of the airport supply diesel and petrol to the airport's vehicles. All vehicles have sensors that monitor their individual consumption.

Petrol consumption fell in 2004 from 63 m^3 to 58 m^3, whilst diesel consumption rose from 711 m^3 to 718 m^3. Thus, petrol consumption accounted for about 8% of total fuel consumption.

Herbicides

Weed control in the airport area is mainly carried out mechanically. However, for safety reasons herbicides are used in areas along the perimeter fence and along runways and taxiways.

A minor increase in consumption to 133 litres was recorded in 2004, as recent years' very low consumption has resulted in problems with grass eroding the pavement. Grass growing through paved areas results in holes, and rain water leaking through these holes can undermine the pavement. Copenhagen Airport only uses herbicides approved by the Danish Environmental Protection Agency and will continue to focus on minimising consumption.

Environmental impact of terminal activities at Copenhagen Airport

Energy consumption

CPH distributes electricity, water and heat to users and lessees at the airport and owns, operates and maintains all the supply networks for this purpose. CPH is an energy conscious business which shares the responsibility for the CO_2 problem and therefore actively seeks to use energy resources in the best possible way and reduce unnecessary energy consumption.

Careful registration of energy consumption and the continuing assessment of consumption are factors contributing to optimal exploitation of the energy resources by CPH as well as by the lessees at the airport to whom CPH supplies energy.

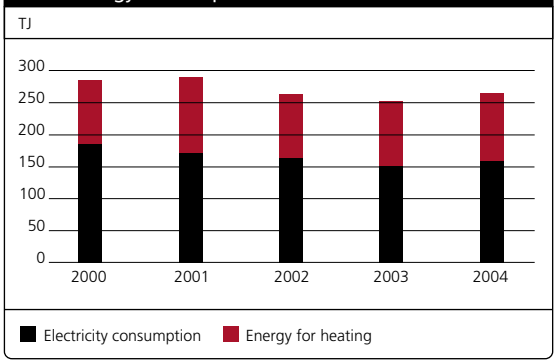
Heating of premises and hot water is based mainly on district heating and, to a lesser extent, on natural gas. Oil and electricity is used only to a limited extent for heating in cases where the other types of heating cannot be used.

CPH is in charge of joint purchasing of electricity and heating on behalf of the users of the airport's buildings, equipment and areas. As the electricity market has been deregulated, all electricity purchases are made via the Nordpool electricity market. In addition, CPH produces a moderate volume of electricity, partly from a small heating and power plant using natural gas, and partly from the diesel power generating plants used to secure the power supply for the terminal area and for the runway installations.

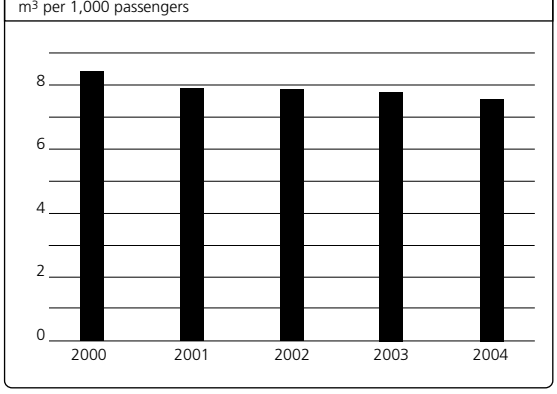
The back-up power supply was a major focal area in 2004 due to a major power blackout that occurred in 2003. Supplementary diesel power generating plants and a restructuring of the back-up power supply system help ensure smooth operation of air traffic even in the event of a prolonged power breakdown.

In 2002, CPH adopted an energy policy aimed at promoting energy saving initiatives and improving energy efficiency in general. As a result, energy consumption has been falling over the past couple of years. In 2004, the power consumption increased by about 2.5% compared with the 2003 level in spite of the bigger growth in passenger numbers. Reductions were mainly achieved by replacing sources of light and intensifying the management of the lighting facilities, and by increasing the measurement and thus the control of consumption.

Total energy consumption



Water consumption



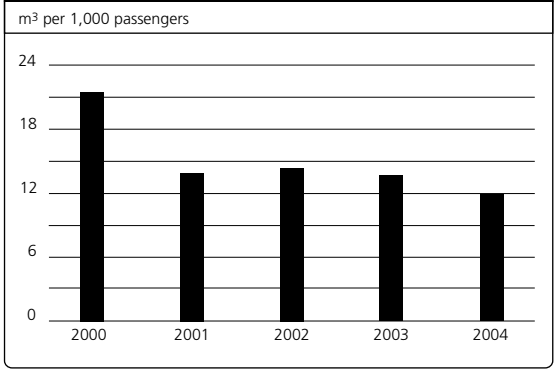
Heating consumption rose slightly as a result of the growing passenger numbers and an increase in heated areas compared with 2003 caused by takeover of former rented areas. In addition, there was greater focus in 2004 on improving the ability of the heating plants to cool down water, thereby increasing energy efficiency, and less focus on actually reducing consumption.

CPH's total consumption in 2004 was 257.8 TJ, which was about 1.9% more than in 2003.

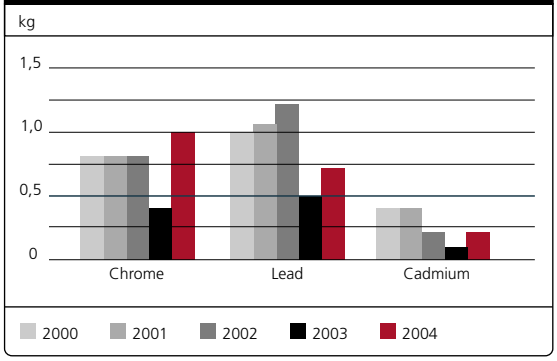
Water consumption

Water supplied to Copenhagen Airport comes from the municipalities of Taarnby and Dragør. In addition, second-quality water from a local preventive drilling is used to cool technical rooms and for car wash purposes. Experiments were made in 2004 aimed to increase the rate of reuse of second-quality water in order to reduce drinking water consumption. Water consumption in 2004 was about 5% higher than in 2003, mainly due to the increase in passenger numbers in the terminal area. Water consumption per 1,000 passengers fell during the same period from 7.8 m^3 to 7.6 m^3.

Waste water discharged



Waste water – discharge of heavy metals



Waste water

The quality of waste water is affected by a large number of activities performed by CPH and the lessees at the airport. The activities include maintenance activities and food production for flights, restaurants and staff canteens. Furthermore, waste water is affected by activities in the terminal area.

The total volume of waste water discharged in 2004 was 225,506 m^3; this was discharged to the municipalities of Dragør and Taarnby. The volume corresponds to 11.9 m^3 per 1,000 passengers, continuing the track record of reductions also in 2004. The combined reduction since 2000 is 44.6%. Most of the waste water is discharged to the municipality of Taarnby, the average daily volume being about 600 m^3. The volume discharged to the municipality of Dragør is about 16 m^3 per day.

Waste water samples are taken monthly and analysed for a number of substances. The samples generally showed the same levels as in 2003. There was a major reduction in the content of oil and grease compared with 2003. In 2004, experiments were made to remove sources that cause hydrogen sulphide formation in certain parts of the sewerage. These experiments affected grease in the waste water and caused it to precipitate within the sewerage before reaching the airport's waste water discharge points. This resulted in a number of operational problems, and the issue will therefore be readdressed in 2005. As a result, the grease content will increase again in 2005. The grease content affects the results for COD, among others, and a fall will also be seen here.

The content of heavy metals is showing a minor increase. This was especially the case for zinc and nickel. The content of heavy metals mainly comes from maintenance activities.

In order to safeguard against substances leaking out or ground water leaking in through the airport's waste water and surface water pipes, oil separators and wells, CPH has prepared an action plan for the renovation of the waste water and surface water systems covering the period until 2013. The renovation work began in 2003, comprising improvements to the sewer network in the western and southern sections of the airport. The renovation in the southern section will continue in 2005.

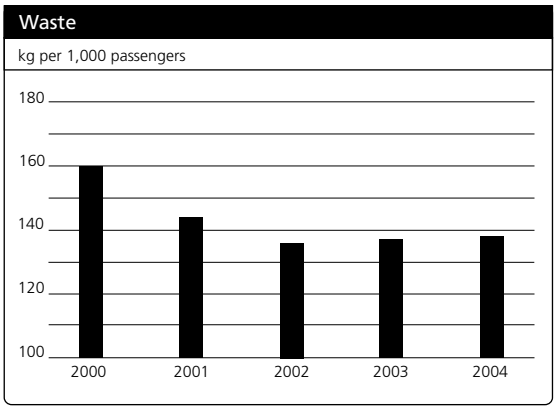
Waste

Waste at Copenhagen Airport is generated from two main areas: waste from aircraft and waste from activities on the ground. Airlines are responsible for waste from aircraft, while CPH is responsible for disposal of waste from the 3 passenger terminals as well as from CPH's maintenance facilities and administration buildings. CPH has established a container area where waste segregation takes place.

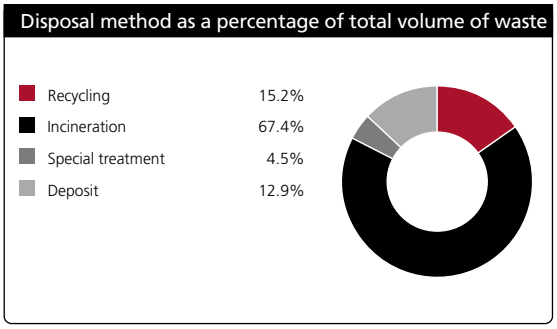
The total amount of waste was 9% higher than in 2003, which compares roughly to the increase in passenger numbers. Waste per 1,000 passengers rose from 137 kg to 139 kg.

The proportion of recyclable waste was 15% of the total amount of waste, the same level as in 2003. Recyclable waste is primarily cardboard, paper, iron and metals. Most of the recyclable waste is generated continuously from the operation of the airport, but a smaller and highly varying part is generated in connection with various cleaning-up processes; for instance, 26 tonnes of snow fence were disposed for recycling in 2004.

The amount of waste for incineration was 11% higher than in 2003. This was primarily a result of the increase in passenger numbers. Waste for incineration primarily consists of mixed combustible waste from offices, shops, kiosks and passenger areas in general.



The volume of waste for special treatment dropped 7%. Waste for special treatment primarily consists of water with a small content of oil and/or soap from the washing of stands etc. after oil spills and the like. One of the factors affecting the volume of this waste is the amount of precipitation and the time of year the collection tanks are emptied. As a result, there are major, fluctuations in the volume of waste for special treatment. The volume



of waste bound for landfill sites was unchanged from 2003. This type of waste primarily comes from infrastructure maintenance and is not affected by changes in passenger numbers. The largest fraction for disposal to landfills is waste vacuumed from streets, stands and similar areas.

Environmental impact of Roskilde Lufthavn

Noise

When Roskilde Airport was opened in 1973, the projection was that the airport would be fully utilised, corresponding to 200,000 aircraft operations, including 25,000 scheduled or charter flights.

Roskilde Airport is today used as a regional airport for the Copenhagen metropolitan area and Zealand. The airport is mainly used for general aviation and training flights, and the aircraft used are typically small, within the 1,000-1,999 kg weight class.

In 2004, there were 73,231 aircraft operations at Roskilde Airport, a substantial decline from the level of about 95,000 in recent years. The runway system at Roskilde Airport consists of runways 03-21 and 11-29. The distribution of traffic on the runways in 2004 did not differ significantly from the normal use of the system over a ten-year period.

Aircraft engine testing contributes to the noise impact in the areas around the airport, and a number of provisions have been introduced to minimise the noise nuisance as much as possible. Engine run-ups have been referred to special areas and are basically only allowed in the period between 07:00 and 18:00. In 2004, the number of engine run-ups was 118, and 1 incident of deviation from the provisions was reported to the environmental authorities.

In 2003, CPH initiated an Environmental Impact Assessment (EIA) study in order to meet the growing interest in traffic out of Roskilde Airport. This study was continued in 2004, and it is expected that the Greater Copenhagen Authority (HUR) will adopt an amendment to the regional plan that includes the EIA report in 2005.

Energy and water consumption

Energy consumption for heating rose 13% from 2003 to 2004. A similar increase, 14%, is found when variations in outdoor temperatures are taken into account. Total electricity consumption increased 5%, which was mainly due to the installation of additional air conditioning at the airport.

Water consumption was down 18% from 4,567 m^3 in 2003 to 3,724 m^3 in 2004.

Waste

Waste from Roskilde Airport primarily consists of ordinary household-like waste generated from the passenger terminal, administration building and maintenance facilities. The estimated volume was below 50 tonnes in 2004.

Occupational health and safety

Occupational health and safety activities at CPH are organised in a safety organisation consisting of a main safety committee and 3 safety committees reporting to the COO level. The composition of the committees was changed in 2004 to make them reflect the structure of the line organisation.

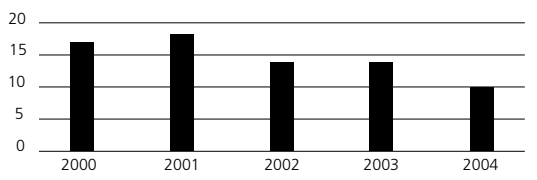
The inspections by the safety organisation were intensified in 2004. Most middle management staff participated in the inspections within their own areas of responsibility, which helped enhance the visibility of safety work and the safety groups' work to promote a good working environment.

Activities during 2004 focused on reducing the number of industrial accidents. The number of industrial accidents recorded was 27 at Copenhagen Airport and 1 at Roskilde Airport, corresponding to a frequency of industrial accidents of 10 per million working hours. The major reduction was the result of several factors: a greater focus on industrial accidents and quick follow-up when accidents occur; a special focus on the chemical working environment is beginning to bear fruit; and generally more focus on the occupational health and safety. Focus on the physical conditions in the workplace and planning of work together with a more open dialogue has also had a positive effect on workplace behaviour.

The average number of days off due to illness in connection with industrial accidents rose from 10 in 2003 to 13.4 in 2004. The increase was caused by one serious accident, which resulted in almost 6 months' sick leave.

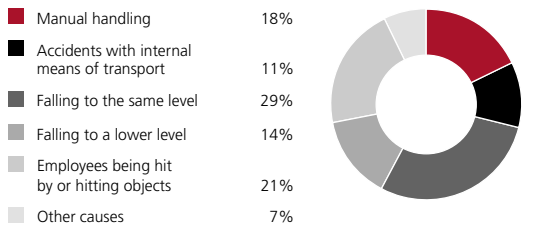
Industrial accidents – Copenhagen Airport

per 1 million working hours



The breakdown of industrial accidents shows that the primary cause of industrial accidents was falling to the same level, which accounted for 29% of all industrial accidents. Falling to a lower level caused 14% of the accidents, whilst 21% of accidents were caused by employees being hit by or hitting objects. Manual handling caused 18% of accidents, whilst accidents with internal means of transport accounted for 11%, and finally 7% of accidents had other causes.

Breakdown of causes of industrial accidents



Accounting policies

The Environmental Report of CPH describes the developments in the environmental impact from operation, maintenance and extension of the airports of Copenhagen and Roskilde.

An Environmental Impact Assessment (EIA) of the extension of Copenhagen Airport from 1996 and Copenhagen Airport's environmental approvals from 1997 upheld by the Danish Environmental Appeal Board in May 1999 form the basis of the selection of environmental factors assessed to be of significance for CPH's activities. The Environmental Report describes developments in these environmental factors since they constitute impacts that CPH is responsible for and monitors and controls.

Data in the report is based on regular compilation from the individual areas at the airports. They have been collated in a central database for further processing. Data is provided in one of the following ways:

- Externally documented loggings
- Internal loggings
- Calculated data
- Estimated data

The accounting policy for occupational health and safety has changed in 2004. Earlier the industrial accidents were registered by date of reporting. Now the industrial accidents are registered by date of accident. The industrial accident frequency for the previous years has been recalculated using the new accounting policy. This has caused a marginal displacement of the frequency between the years.

The environmental report has been prepared in accordance with the following accounting policies:

Traffic and noise

Traffic growth is calculated on the basis of data in CPH's traffic statistics system and includes all aircraft operations by aircraft type, take-off weight, use of runway and time. Total noise impact at the airport from takeoffs and landings is calculated using the TDENL method and is calculated on the basis of each aircraft operation including aircraft type and time of day.

The number of noise events resulting from night flights to and from Copenhagen Airport is monitored and logged by CPH's noise monitoring system. The number of engine testing incidents, including the number of engine idle-run incidents and deviations from rules on engine testing, are stated in this environmental report on the basis of reports received from the airlines.

Air quality

The air quality at Copenhagen Airport is monitored and logged by CPH's air quality monitoring system. The system also collects meteorological data.

Oil and fuel spills

The number of oil and fuel spills is calculated as the number of reports filed by Security, Fire Service or other in-house and third-party sources. The calculation of the volume of spills is subject to uncertainty as it is rarely possible to measure the exact volume of a spill.

De-icing

The volume of glycol used for de-icing of aircraft is calculated by the companies handling de-icing. The annual volume of glycol collected is determined based on the registered volume for each truckload removed and is adjusted for tank contents at the beginning and end of the year. The consumption of de-icers for runways and taxiways is calculated based on the volumes purchased adjusted for inventory change.

Surface water

The volume of surface water discharged is calculated on the basis of the pump effect of CPH's pumps for outlet U5 and the volume of precipitation reported by the Danish Meteorological Institute (DMI) for other discharges. The water quality is determined on the basis of analyses of periodical water samples carried out by a third-party laboratory.

Herbicides

The consumption of herbicides is calculated on the basis of volumes purchased adjusted for inventory change.

Resources and energy

Each type of consumption is calculated on the basis of volumes purchased/registered less quantities sold to other companies at the airport. The heated area is estimated on the basis of the BBR Register. Diesel consumption includes fuel for emergency power generating units.

Waste water

The volume of waste water discharged is registered by means of online meters connected to CPH's central tracking system (CTS). Water quality is determined on the basis of analyses of periodical water samples carried out by a third-party laboratory.

Waste

Most data on waste is collated from weighing slips or monthly statements from recipients of the waste. In some cases it is not possible to calculate the quantity of the waste since the weight or volume is not registered. In those cases, the weight is estimated.

Occupational health and safety

The number of industrial accidents is the number of accidents registered at CPH reported per year causing one or more days of sick leave. Industrial accidents are registered by date of accident. The industrial accident frequency is calculated as number of industrial accidents per one million working hours.

Auditors' statement

to the Shareholders of Copenhagen Airports A/S

We have assessed the Environmental Report of Copenhagen Airports A/S for 2004 with a view to issuing a statement on the Report.

Criteria for the preparation of the Environmental Report
The Environmental Report comprises environmental impacts of the Company's airports in Copenhagen and Roskilde.

The criteria for the preparation of the Environmental Report appear from the accounting policies described on page 22. The accounting policies state the basis for the choice of environmental impacts for reporting, the reason for the activities chosen and the recognition and measurement methods used for presenting environmental data in the Environmental Report.

Responsibilities
The Environmental Report is the responsibility of Company Management, including the establishment of registration and internal control systems to ensure a reliable reporting basis, the fixing of acceptable reporting criteria and the choice of data to be collected.

Our responsibility is to express an opinion on the Environmental Report based on our assessment.

Basis of Opinion
We have planned and performed our work in accordance with the International Standard on Assurance Engagements (ISAE) 3000 with a view to obtaining limited assurance that:

- the Environmental Report correlates with the Company's activities for the financial period;
- the data stated in the Environmental Report for 2004 for the activities comprised have been documented and accurately and reliably stated in accordance with the methods described for recognition and measurement in the accounting policies.

The assurance obtained is limited as our work has been limited compared with an audit as-signment. Our work has primarily comprised inquiries, accounting technical analyses of accounting figures and other information. Moreover, we have tested data and underlying documentation and checked whether the accounting policies have been observed.

Opinion
Nothing has come to our attention that causes us to believe that the data disclosed in the Environmental Report for 2004 have not been stated in accordance with the criteria described.

Copenhagen, March 3, 2005

PricewaterhouseCoopers
Statsautoriseret Revisionsinteressentskab

Jens Otto Damgaard
State Authorised Public Accountant

Birgitte Mogensen
State Authorised Public Accountant

Glossary

Aircraft operation

Term used in airport statistics to designate a takeoff or landing.

BI_5
Oxygen consumption for the biological process measured over five days.

COD
Chemical oxygen demand, a method of analysis to determine the content of organic matter in water.

CPH
Copenhagen Airports A/S.

dB
Decibel; logarithmic unit of sound measurement. The A-weighted sound pressure level, dB(A) often used, a measurement of the ability of the human ear to perceive sound energy.

De-icing
Removal of ice and snow from paved areas at the airport or removal of ice from aircraft wings.

Degree days
The degree-day figure for the year is the sum of all degree days of the year. The degree-day figure for a day is calculated as 17 degrees centigrade less the mean temperature of the day if less than or equivalent to 17 degrees centigrade. Otherwise the degree-day figure is 0.

Detergents
Added to washing and cleaning agents to lower the surface tension of water.

Engine testing
Testing of aircraft engines during inspection and repairs. Testing can either be performed at engine run-up (start and running of the engine at higher effect than idle-run) or idle-run (start and running of the engine at idle-run effect).

Formiate
Chemical used for de-icing runways and taxiways.

GJ
Giga Joule, 10^9 Joule.

Glycol

Agent used for de-icing aircraft. Copenhagen Airport uses propylene glycol.

Handling
The handling of passengers, baggage, cargo, etc.

NO_2
Nitrogen dioxide.

Particles
Soot in emission gases for instance from diesel engines.

PM_{10}
Particulates with a maximum diameter of 10 µm.

Stands
Aircraft parking spaces during stays at the airport, with or without passenger loading bridges.

Taxiways
Paved stretches between runways and aircraft stands.

TDENL method
Total-Day-Evening-Night-Level; method used for continuous control of noise impact around airports and airfields. The method, which expresses the noise impact in a single number, the TDENL value, is recommended by the Danish Environmental Protection Agency and is based on DENL, which is used for noise mapping of airports. DENL is the average A-weighted noise pressure level (Day Evening Night Level) during an average 24-hour period with the addition of 5 dB for noise events between 19:00 and 22:00 and 10 dB for noise events between 22:00 and 07:00.

TJ
Tera Joule, 10^{12} Joule.

Total N
Total nitrogen content.

Total P
Total phosphate content.

Urea
Nitrogen-based de-icer.

Environmental data

	Unit	2000	2001	2002	2003	2004
KEY FIGURES – COPENHAGEN AIRPORT						
Passengers	number	18,119,752	18,136,274	18,272,173	17,714,007	19,034,585
Aircraft operations	number	303,713	288,739	266,894	259,002	272,518
ENVIRONMENTAL IMPACT OF AIRCRAFT ACTIVITIES AT COPENHAGEN AIRPORT						
Noise impact	TDENL in dB	150.2	149.6	147.9	145.8	146.1
Night period maximum noise levels from takeoff and landing						
86 dB(A)	total	2	7	5	2	3
87 dB(A)	total	2	2	0	2	0
88 dB(A)	total	1	1	1	0	1
89 dB(A)	total	3	2	0	2	0
90 dB(A)	total	0	1	0	1	0
>90 dB(A)	total	0	0	2	0	0
Use of runways						
04L Takeoff/landing	% breakdown	0.0/25.2	0.1/35.2	0.0 / 41.3	0.0 / 33.4	0.0 / 30.3
04R Takeoff/landing	% breakdown	25.0/0.1	35.1/0.1	41.1 / 0.2	32.8 / 0.1	30.0 / 0.1
22L Takeoff/landing	% breakdown	4.9/69.0	5.0/58.4	3.9 / 52.1	5.3 / 62.2	4.8 / 65.8
22R Takeoff/landing	% breakdown	69.4/2.9	59.0/2.1	52.6 /1.6	61.6 / 1.9	65.0 / 1.6
12 Takeoff/landing	% breakdown	0.2/0.4	0.5/1.0	2.1 / 0.4	0.1 / 0.2	0.0 / 0.2
30 Takeoff/landing	% breakdown	0.5/2.4	0.3/3.2	0.2 / 4.3	0.2 / 2.2	0.2 / 2.0
Weight breakdown, aircraft types						
0-29 tonnes	total	107,199	93,883	89,827	94,831	101,359
30-49 tonnes	total	18,943	14,275	15,629	14,163	11,916
50-69 tonnes	total	135,038	137,287	114,235	93,514	92,777
70-119 tonnes	total	27,457	28,259	34,349	45,124	55,799
120-299 tonnes	total	13,273	13,599	11,734	10,140	9,213
> 300 tonnes	total	1,803	1,436	1,120	1,230	1,454
Engine testing	total	1,865	1,604	1,579	1,593	1,465
Of which idling	total	1,000	936	1,006	848	695
Deviations	total	23	8	6	6	10

	Unit	2000	2001	2002	2003	2004
Air quality						
NO_2	µg/m³		22	19.4	21.5	22.1
PM_{10}	µg/m³		19	20.9	23.2	19.6
NO	µg/m³		9.7	7.8	7.2	6.3
Oil and fuel spills						
0-9 litres	total	149	152	172	184	131
10-49 litres	total	106	103	71	95	66
50-249 litres	total	17	15	12	10	17
> 250 litres	total	2	1	1	0	3
Aircraft de-icing						
Glycol consumption	m³	294	763	313	490	530
Collected glycol	m³	144	444	215	302	373

	Unit	2000	2001	2002	2003	2004
ENVIRONMENTAL IMPACT OF RUNWAY ACTIVITIES AT COPENHAGEN AIRPORT						
Discharge of surface water	m^3	2,204,550	2,475,828	3,427,392	2,736,071	3,545,565
Surface water – discharged agents						
Total-N	kg	11,408	11,463	10,289	5,834	9,255
Total-P	kg	773	877	1,193	409	558
Bl_5	kg	178,943	73,046	53,873	46,719	30,464
Total hydrocarbons	kg	133	160	90	222	451
Zinc	kg	160	89	137	129	108
Chrome	kg	3.0	1.1	0.4	0.0	2.2
Copper	kg	33	21	35	24	13
Nickel	kg	7	9	10	10	10
Lead	kg	4.6	1.9	2.2	1.6	2.3
Cadmium	kg	1.0	0.9	0.9	0.4	0.3
Consumption of runway de-icing						
Formiate	kg	270,000	1,195,000	830,358	923,565	1,093,241
Sand (5% urea)	kg	101,000	120,000	12,000	28,000	55,000
Fuel consumption						
Petrol	m^3	67	71	68	63	58
Diesel	m^3	633	772	609	711	718
Consumption of herbicides	litres	100	40	110	120	133

	Unit	2000	2001	2002	2003	2004
ENVIRONMENTAL IMPACT OF TERMINAL ACTIVITIES AT COPENHAGEN AIRPORT						
Electricity consumption	TJ	186	172	163	151	155
Energy for heating	TJ	100	118	101	102	103
Energy consumption per 1,000 m²	TJ	0.49	0.58	0.49	0.50	0.46
Water consumption	m³	152,641	143,112	143,537	138,662	145,171
Water consumption per1,000 passengers	m³	8.4	7.9	7.9	7.8	7.6
Discharge of wastewater	m³	390,317	251,558	263,681	242,228	225,506
Discharge of wastewater per 1,000 passengers	m³	21.5	13.9	14.4	13.7	11.9
Wastewater – discharged agents						
Total-N	kg	23,688	21,857	21,003	21,930	21,631
Total-P	kg	3,010	3,432	3,376	2,864	2,533
COD	kg	189,519	180,176	194,698	168,736	122,493
Detergents	kg	1,564	1,358	2,064	1,470	1,515
Oil and grease	kg	17,493	15,891	10,200	9,452	3,220
Zinc	kg	73	86	54	44	61
Chrome	kg	0.8	0.8	0.8	0.4	1
Copper	kg	13	16	12	10	12
Nickel	kg	1.2	1.4	1.5	1.1	3.2
Lead	kg	1.0	1.1	1.2	0.5	0.7
Cadmium	kg	0.4	0.4	0.2	0.1	0.2
Waste volume	tonnes	2,908	2,608	2,491	2,432	2,643
Waste removal method:						
Recycling	%	17.4	16.3	13.8	14.7	15.2
Incineration	%	61.3	69.2	64.9	66.0	67.4
Special treatment	%	5.1	2.5	6.1	5.2	4.5
Deposit	%	16.2	12.0	15,2	14.1	12.9
Waste volumes per 1,000 passengers	kg	160	144	136	137	139

	Unit	2000	2001	2002	2003	2004
ENVIRONMENTAL IMPACT OF ROSKILDE AIRPORT						
Passengers	total	33,598	35,618	49,278	43,220	33,511
Aircraft operations	total	97,165	98,039	98,4 16	90,658	73,231
Weight breakdown, aircraft types						
0-999 kg	total	6,541	5,896	6,934	9,659	11,084
1000-1999 kg	total	83,502	84,378	83,445	74,485	56,615
> 2000 kg	total	7,122	7,765	8,037	6.515	5,532
Use of runway						
03 Takeoff/landing	% breakdown	3.7 / 4.1	7.4 / 7.8	7.5 / 7.8	9.2 / 9.7	7.7/8.1
11 Takeoff/landing	% breakdown	26.1 / 32,6	23.3 / 30.2	32.0 / 38.9	25.8 / 33.5	27.8/33.4
21 Takeoff/landing	% breakdown	43.7 / 36.4	42.9 / 34,4	40.1 / 32.1	40.9 / 32.4	39.7/33.5
29 Takeoff/landing	% breakdown	26.5 / 26,.9	26.4 / 27.6	20.4 / 21.2	24.1 / 24.4	24.8/25.0
Engine testing	total	-	-	-	179	118
Of which idling	total	-	-	-	13	7
Deviations	total	-	-	-	2	0
Electricity consumption	GJ	2,509	2,763	2,687	2,977	3,121
Energy consumption for heating	GJ	2,712	3,228	2,706	2,953	3,327
Energy consumption per m^2 (1)	GJ	0.92	1.10	0.92	1.00	1.13
Water consumption	m^3	5,703	5,847	3,992	4,567	3,724
OCCUPATIONAL HEALTH AND SAFETY - CPH						
Industrial accidents – Copenhagen Airport (2)	per 1 million working hours	17	18	14	14	10
Industrial accidents – Roskilde Airport (2)	per 1 million working hour	0	0	18	0	(3) 14
Employees	total	1,399	1,388	1,347	1,352	1,480

(1) Data for 2000-2003 are adjusted according to a new calculation of heated area.

(2) Data for 2000-2003 are adjusted according to the new accounting policy.

(3) The industrial accident frequency is based on 1 industrial accident.

Copenhagen Airports CPH

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