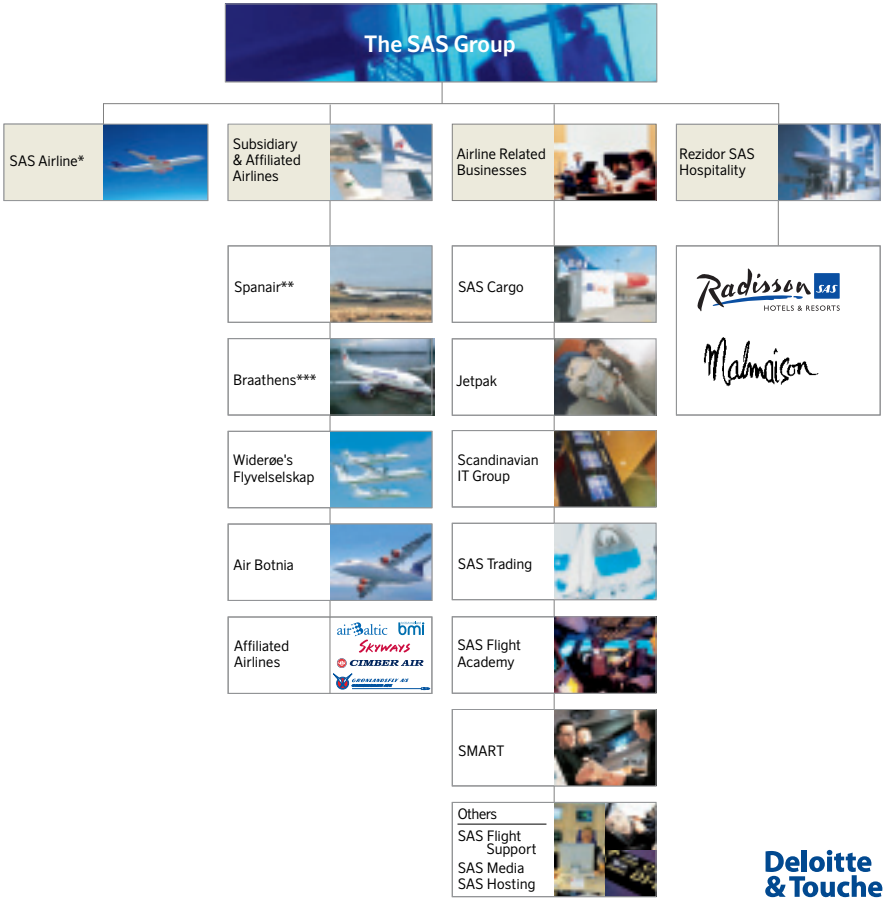
The SAS Group Environmental Report 2001

This year SAS has chosen to publish its environmental report exclusively on the Internet, but also to expand the environmental information contained in its annual report. Our ambition is to intensify our dialogue with important stakeholders such as employees, shareholders, financial analysts, customers, authorities, politicians, the general public, students and the media. The SAS Environmental Report 2001 covers most Group companies. Although the work of coordinating reporting from the various companies has begun, much remains to be done before a report covering the entire Group is feasible. However, the information presented here comes from operations responsible for more than 90% of the Group's environmental impact. The structure of this document mirrors that of SAS Group's new organization. To go right to a business area or company, just click on the picture in the organizational chart representing it. Although the document is formatted for reading-on-screen, there are "print" buttons for all articles for those desiring printouts. We are greatly interested in your views on SAS's Environmental Report 2001. Although there is a form that takes only a few minutes to fill out (see link below), you may also just send an e-mail to: environment@sas.se.

NB! The function "Print out article" requires Acrobat© Reader© 5.0. Click here to download the product.

- We would like to know your opinion about the SAS Environmental Report 2001
- Here you can go directly to SAS Airline's Environmental Accounts
- Emissions calculator
- This is how the SAS Environmental Report 2001 works

Click here to read about the various business areas



Contact SAS

We would like to know what you think of our environmental activities and our environmental report. Feel free to send your comments by letter, fax or the environmental section of our web site. You can also order copies of current or previous environmental reports, the year´s annual report with environmental report summary and other material from SAS's environmental information program.

For comments:
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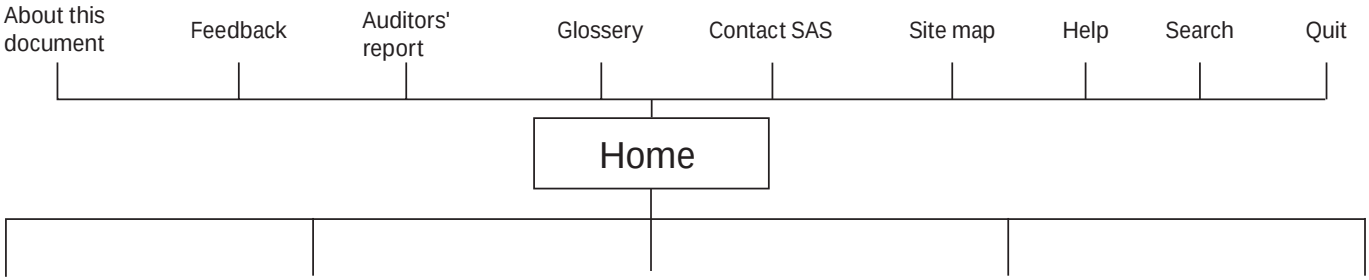
My opinion about the SAS Environmental Report 2001

Site map



Here you can navigate backward or forward one page at a time.

The page you came to when you opened the document. You can click on the pictures on this page to navigate further.

This provides definitions of environmentally-related terms and abbreviations.

Here you can send us your views on the SAS Environmental Report 2001. Clicking this item opens your e-mail program with SAS's address automatically filled in.

This gives you an overview of the structure and contents of the document.

Here you do free-text searches of the entire document.

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The structure of the environmental report on the Internet is based on the SAS Group's new organization. Each page clearly shows you where in the document you happen to be.

The document contains four different kinds of link: at the farthest left there are links to the various main texts. To the right are bookmarks that mark sections in the various texts. There are also links to the other sections or to information sources on the Internet that lie outside this document.

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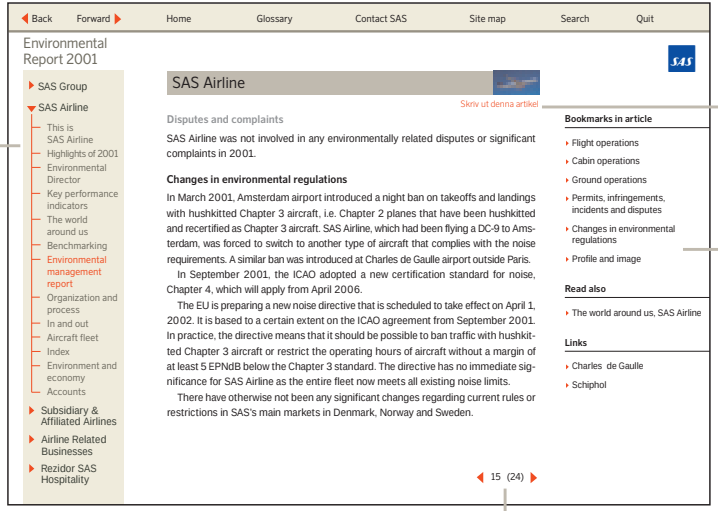
A sample the menus found under the particular business areas. The section where you are located is marked in red.



Here you click to print out the current article. The section printed out in A4 portrait format.

Here you see headlines in the current article or for other related articles. Here there are also links to interesting documents and businesses and organizations on the Internet.

Instead of using the quick-search function in the article menu to the right, you can use the forward arrow to read the entire article in sequence. The number indicates the article's page.

Glossary

Acidification A chemical reaction that lowers the pH level in lakes, groundwater and soil due to the effects of nitric acid, which is formed from nitrogen oxides (see definition), and sulfuric acid, which is formed from sulfur dioxide.

Acid precipitation on the surface of foliage directly affects plant life. Biodiversity in lakes and waterways decreases. Acidification increases the solubility of heavy metals and aluminum in the soil, which can inhibit root growth. Acid rain attacks iron structures and objects of sandstone, limestone and marble, such as statues and facade ornamentation.

Acetate Acetic acid (CH^3COOH). Used by airport operators to deice takeoff and landing strips, as a more environmentally friendly alternative to urea (see definition). Contributes to nutrification/eutrophication.

AEA (Association of European Airlines), cooperative body for European airlines.

ASK (Available Seat Kilometers), the available (offered) number of passengers seats multiplied by the distance flown (see also ATK, RPK, RTK).

ATK (Available Tonne Kilometers), available (offered) capacity for passengers and cargo expressed in metric tonnes, multiplied by the distance flown (see also ASK, RPK, RTK).

Biofuel Solid or liquid fuel derived from organic matter, primarily plants.

Cabin factor Percentage of available passenger capacity that is utilized during a flight. Normally, only “revenue passengers”, i.e. passengers paying at least 25% of the normal ticket price, are included in calculation of the cabin factor.

CAEP (Committee on Aviation Environmental Protection), technical committee of the ICAO (see definition) charged with developing and establishing rules and recommending measures to reduce the environmental impact of aviation.

Carbon dioxide (CO_2) A colorless gas that is formed in combustion of all fossil fuels. The airline industry’s CO_2-emissions are being reduced through a changeover to more fuel-efficient aircraft, something that is also desirable from a financial standpoint since lower fuel consumption automatically means lower costs.

Carbon monoxide (CO) A toxic and combustible gas formed by incomplete burning of substances containing carbon, e.g. fossil fuels.

Certification requirements The ICAO’s minimum requirements for certification of aircraft types, such as limits for noise and emissions of carbon dioxide, nitrogen oxides and hydrocarbons (see Chapter 2, 3).

CFCs (Chlorofluorocarbons), certain halogenated hydrocarbons, best known under the trademark Freon.

CO_2 Carbon dioxide (see definition).

Concession Official permit to conduct certain operations, often designed to ensure compliance with environmental protection requirements and appropriate utilization of natural resources.

Chapter 2, 3 Certification standards for noise according to the ICAO’s document Annex 16. Specifies the maximum permitted noise levels. Chapter 3 means a lower noise level than Chapter 2, and the coming certification standard Chapter 4 denotes a lower noise level than Chapter 3.

DAC (Double Annular Combuster), a technology that reduces nitrogen oxide emissions from aircraft engines.

ECAC (European Civil Aviation Conference), a forum for cooperation and coordination between European national authorities in matters related to civil aviation.

Ecoefficiency A term launched primarily by the environmentally-oriented business organization WBCSD. Ecoefficiency is defined as a tool that companies can use to measure their environmental performance relative to how market demands are met and the company’s financial performance is improved. The goal of ecoefficiency is to generate qualitative growth where value is created instead of transforming unnecessary volumes of material and energy into waste.

Ecosystem An ecological system encompassing all life and living environments within a defined area.

Emission Dispersal of a substance into the air, water or soil.

Glossary

ENTAF (Environmental Task Force), a work group within the IATA that deals with environmental issues.

EPNdB Equivalent Perceived Noise, a unit commonly used in an aviation context to express the average perceived noise level. (See also Noise.)

Fossil fuels Fuels consisting of organic carbon and hydrogen compounds in sediment or underground deposits – especially coal, oil and natural gas.

Freon See CFCs.

GCD Great Circle Distance, definition of the shortest flight distance between two points, taking the curve of the earth's surface into account.

Germicides Chemicals used to kill or prevent the growth of harmful microorganisms such as bacteria, virus or fungus. Added to the sanitizing liquid in aircraft lavatories reduce the risk of infection.

Glycol An alcohol that is sprayed on the aircraft in cold weather to prevent ice formation. Today, a non-toxic propylene glycol is used. Some 80% of the glycol runs off the aircraft when applied, and seeps into the ground unless collected. A further 15% is emitted into the air is thus dispersed in the vicinity of the airport. The airports are responsible for collecting the glycol runoff for re-use.

Greenhouse effect Carbon dioxide and other gases trap and reradiate incoming solar radiation that would otherwise be reflected back into space. The problem is that emissions of greenhouse gases have increased. Most scientists agree that heavy human use of fossil fuels is causing global warming. Carbon dioxide is formed in combustion of all fossil fuels, but burning of biofuels only emits an amount of carbon equal to that absorbed during growth, producing no net emissions. However, use of coal, oil and natural gas produce a net increase, since they release carbon that has been bound in the earth's crust. The freon substitute HFC, methane and nitrous oxide are other powerful greenhouse gases.

Other gases that contribute to the greenhouse effect are CFCs (see definition), methane and nitrous oxide.

Halons A collective name for halogenated hydrocarbons and, specifically, a brand name for a fire extinguishing agent.

HCs Hydrocarbons (see Volatile organic compounds).

Heavy metals Certain high density metals, such as cadmium and mercury, that have both acute and chronic toxic effects.

Hydrocarbons See Volatile organic compounds.

IATA (International Air Transport Association), the UN cooperative body for around 270 of the world's airlines.

ICAO (International Civil Aviation Organization), the UN's agency for international civil aviation. One of its functions is to develop internationally binding norms for commercial aviation.

IFCA (Inflight Catering Association), an organization for all companies and suppliers involved in the airline industry's catering operations. Has 600 member companies worldwide.

Insecticides Chemicals that are used to combat insects.

IPCC (Intergovernmental Panel on Climate Change), an expert panel established by the United Nations Environment Program UNEP and the World Meteorological Organization WMO to assess the consequences of human-induced climate change.

ISO 14000 A series of international environmental standards developed by the International Organization for Standardization. The general guiding principles for ISO 14000 are identical to those in the quality standard ISO 9000. There are several environmental standards in the ISO 14000 family, such as for environmental management systems (ISO 14001), environmental labelling, environmental audits and life cycle analyses.

N-ALM The Nordic Working Group for Environmental Issues in Aviation, composed of civil aviation, environmental and communication authorities and airlines in the Nordic countries.

Nitrogen oxides (NO_X) Formed in all combustion in aircraft engines since the high temperature and pressure cause the atmospheric nitrogen and oxygen to react with each other, mainly during takeoff and ascent when the engine temperature is at a maximum. With effect from 1996 the ICAO has tightened

Glossary

the requirements for nitrogen oxide emissions, and these are expected to be made even stricter. New engines with double annular combusters (DAC), for example, reduce emissions by up to 40% compared with the previous generation of engines.

Noise Environmentally detrimental, undesirable sounds. The environmental impact of air traffic in the form of noise is primarily of a local nature. (See also EPNdB, Chapter 2, 3)

NOx Nitrogen oxides (see definition).

Nutrification From having originally been a local phenomenon in which farming has given rise to nutrification on limited tracts of land, this problem has now expanded to the regional scale as increasingly large areas are affected by nitrogen fallout from the air.

As a result of increased nitrogen levels and rapid growth, leaves and needles to age faster and fall, trees become more sensitive to frost and resistance to parasites decreases. Algae and other microorganisms begin to appear, e.g. on needles and tree trunks, and nitrogen-seeking vegetation eventually dominates the ecosystem, fundamentally altering the biological composition. Nitrogen oxides in water form nitrates, which decrease the quality of drinking water when they seep into the groundwater.

The addition of nitrogen also causes imbalances in waterways, leading to increased production of biological material that consumes a great deal of oxygen during decomposition, and the deoxygenation that may then arises kills fish and shellfish living at the lake bottom. Nitrogen-seeking vegetation proliferates at the expense of other plants, and one well known phenomenon in recent years is the mass-proliferation of certain marine algae.

Oil aerosols Oil emitted from the aircraft engines during operation under high pressure. Upon contact with air they form a fine mist, which is then broken down primarily into carbon dioxide.

Ozone (O_3) 90% of all atmospheric ozone is found in the stratosphere at an altitude of between 10 and 50 km above the earth's surface, where it forms a protective layer that deflects ultraviolet radiation. Use of halogenated hydrocarbons such as freon lead to depletion of the ozone layer. Aircraft emissions of nitrogen oxides in the stratosphere also contribute to this depletion.

Passenger kilometers The number of passengers transported multiplied by the distance flown.

Photochemical Of or relating to a process, reaction, etc., caused by absorption of solar radiation.

Route sector Classification of flights according to different types of traffic – such as scheduled or charter flights – and geographic orientation, e.g. Scandinavia or Europe.

RPK (Revenue Passenger Kilometers), utilized (sold) capacity for passengers expressed as the number of seats multiplied by the distance flown (see also ASK, ATK, RTK). Revenue passengers include only those paying at least 25% of the regular ticket price.

RTK (Revenue Tonne Kilometers), utilized (sold) passenger and cargo capacity expressed in metric tonnes, multiplied by the distance flown (see also ASK, ATK, RPK). Revenue passengers and cargo over a certain payment limit.

Slot The time allotted to a flight for takeoff or landing at an airport.

SO_2 Sulfur dioxide (see definitinon).

Star Alliance Commercial alliance between the airlines Air Canada, Air New Zealand, ANA - All Nippon Airways, Ansett Australia, Austrian Airlines, British Midland, Lauda, Lufthansa, Mexicana de Aviación, SAS, Singapore Airlines, Thai Airways International, Tyrolean, United Airlines and Varig Brasilian Airlines.

Stratosphere Part of the earth's atmosphere (see definition) between 10 and 50 km above the earth's surface.

Sulfur dioxide (SO_2) Formed in combustion of fossil fuels. A colorless gas with an acrid odor that is toxic when inhaled in large quantities. Aviation fuel contains a minute proportion of sulfur, and, accordingly, causes only minor emissions of this substance. The same applies to the "green" diesel used in ground vehicles. In the airline industry, as in many others, sulfur dioxide emissions come largely from oil-fired heating.

Glossary

Sustainable development means that when mankind satisfies its needs to today, it does so without limiting the opportunities for future generations to satisfy theirs.

Tonne kilometers The number of transported metric tonnes of passengers and cargo multiplied by the distance flown.

Triazol Organic aluminum compounds, often used as additives to glycol to prevent corrosion and as a fire retardant. Triazols are long-lived and non-degradable, and are absorbed by living organisms.

Troposphere The lowest layer of the atmosphere (see definition) extending to an altitude of 10 km above the earth's surface.

Urea A urine substance synthetically produced from carbon dioxide and ammonia that is used by airport operators for deicing of runways. Contributes to nutrification/eutrophication. See also Acetate.

Volatile Organic Compounds (VOCs) Emitted during incomplete combustion of fossil fuels – in aviation mainly when the engine is run at low speed and the temperature in the combustion chamber is low. This category also includes all types of solvents that evaporate from detergents and paints, among other things. With effect from April 1, 2002, only aircraft with low VOC emissions will be permitted in the EU.

Weighted landings A term used to express the work input per departure, depending on the aircraft type and route sector. Based on SAS's most common aircraft type (MD-81), which has been assigned a weighted landing value of 1.0. A smaller aircraft that requires a lower work input will have a lower value and a larger aircraft will have a higher weighted landing value.

Wet lease When airlines lease in aircraft including personnel for operation in scheduled traffic. The flights are made using the leased airline's flight numbers. A dry lease is the other version, where only the aircraft are leased in.

This is the SAS Group

Since July 6, 2001, the SAS Group has had a single share through SAS AB, listed on the stock exchanges in Copenhagen, Oslo and Stockholm. The principal owners of SAS AB are the Danish, Norwegian and Swedish states which own 14.3%, 14.3% and 21.4%, respectively, of the shares and voting rights. The remaining 50% of the shares and voting rights are owned by private interests.

Four business areas

The SAS Group has a consolidated operating revenue of MSEK 51,400 and a total of 31,035 employees. The Group is divided into four business areas:

- SAS Airline comprises SAS's passenger transport services with its own aircraft and under its own brand. The business area includes the production company SAS Commuter as well as the independent business units Scandinavian Ground Services and Scandinavian Technical Services.
- Subsidiary & Affiliated Airlines comprises other airlines within the Group. The airline Braathens was acquired in 2001. Widerøe and Air Botnia were already SAS owned. In autumn 2001, an agreement was concluded to increase the holding in Spanair from 49% to 74%. The agreement is currently being examined by the EU Commission. Affiliated companies include Skyways, Cimber Air, British Midland, airBaltic and Grønlandsfly.

Read also

- This is SAS Airline
- This is Subsidiary & Affiliated Airlines

SAS Group

- Airline Related Businesses includes SAS Cargo, Jetpak, SMART, SAS Trading, SAS Hosting and SAS Media – all of which make most of their sales to external customers. The business area also includes SAS Flight Academy and SAS Flight Support, which sell services to internal and external airlines, as well as Scandinavian IT Group which has most of its customers within the SAS Group.
- Rezidor SAS Hospitality is the SAS Group's hotel business and works with two hotel chains, Radisson SAS Hotels & Resorts and Malmaison.

Read also

- This is Airline Related Businesses
- This is Rezidor SAS Hospitality

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Highlights of 2001

- A New Group structure, which means that environmental work can be streamlined and coordinated, was introduced.
- A corporate sustainability, environmental and implementation policy was adopted.
- The acquisition of Braathens by SAS, which promises major efficiency and environmental benefits, was finalized.

"Our goals remain firm"

When I became president and CEO of the SAS Group in May 2001 I took the reins of a prosperous company with a plan for vigorous growth. Our aim: to grow through acquisitions as well as expansion of our own operations. True, there were signs of a recession already then, but the greatest apparent challenge was to harmonize the SAS Group's growth plans with needs for personnel development and improved cost efficiency.

I assumed the leadership of a company that already enjoyed a very good environmental reputation. This I wish to maintain, though circumstances have changed radically since I took over. Except for the Maersk Air affair, everything that has happened in the way of acts of terrorism, war, air accidents plus a deepening recession – resulting in fewer travelers – has been beyond the SAS Group's control.

Compelled to act reactively rather than proactively, we have been forced to painfully adjust to the fact that travel and tourism have declined in the last quarter of 2001. This has affected the entire SAS Group, but particularly SAS Airline and the other carriers. Because of the reduction in flight bookings, SAS Airline's environmental index did not perform quite as positively as we had reason to hope for as recently as August. At the same time, I would like to stress that, in spite of the difficulties in the latter half of 2001, we achieved overall an improved environmental result. The environmental index improved by two points compared with 2000.

The market decline also affects the environmental result in other ways. For exam-

SAS Group

ple, our decision to postpone the delivery of new aircraft for financial reasons will naturally have a short-term impact on SAS's environmental result. However, the decision does not mean we are lowering our ambitions. For economic reasons, too, all our long-term and strategic environmental goals remain firm.

Developments show that environment and economy go hand in hand. Indeed, the environment has become an important competitive factor. For example, more and more of our major customers are taking the environment into account when selecting their travel, transportation and accommodations providers.

Nor has anything changed with regard to our policy of continuous improvement. Even in times of crisis, all decisions made are to lead to improvements. During 2002 we will develop environmental programs for airline and hotel operations alike that will be the most ambitious in those respective industries. With consistent effort, we aim to show that we can be just a bit better than our nearest rivals. The goal is for SAS Airline to be the most environmentally-aware European carrier and for Rezidor SAS Hospitality to take a leading role as a responsible enterprise in the international hotel industry.

Long-term growth

We believe in long-term, sustained growth in the airline sector. Civil aviation growth of approx. 5% per year until 2015, as predicted by the UN Intergovernmental Panel on Climate Change (IPCC), will impact the environment in a major way. Our goal,

Bookmarks in article

- Our goals remain firm
- Long-term growth
- Modernized aircraft fleet
- Award-winning environmental reporting
- Sustainable development

Links

- IPCC

SAS Group

therefore, is to grow our business while reducing our relative environmental impact.

With a forecast growth of 5%, it is reasonable for the world community to take an interest in the environmental impact of the airline industry. Environmental issues were also highest on the agenda at the 2001 annual meeting of the UN International Civil Aviation Organization (ICAO). One of the issues discussed was a new certification standard for noise. Another was how the ICAO should proceed in determining how civil aviation should take its share of responsibility for reducing climatic impact in accordance with the Kyoto Protocol.

ICAO decided to tighten the standards for noise emission levels, and there are many indications they will be tightened even further when the EU introduces a new noise directive. I am happy to say that we await this directive with calm. The draft of the forthcoming EU directive shows we were on the right track in our continuous efforts to minimize the noise emissions of our aircraft. It also confirms the fact that we are doing the right thing in seeking the best commercially available technology when renewing our fleet.

Modernized aircraft fleet

We hope to see an economic upswing by the end of 2002. When that comes, we shall be well prepared. We have maintained our set level of investment and have continued to modernize our fleet in spite of the events of autumn 2001. We are going ahead with our previous decision to order new aircraft, but will, as I previously mentioned, postpone their delivery a few months.

Bookmarks in article

Links

- ICAO
- The Kyoto Protocol

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This means we shall have an aircraft fleet that, over the next 5-year period, will comply with the coming environmental standards, especially those for noise emissions. For the subsequent period, however, our MD 80 fleet will be in the risk zone if noise standards are sharpened further.

More and more airports are introducing noise restrictions. We also know that individual airports as well as countries are considering introducing landing fees that vary according to the noise an aircraft generates. It is also becoming increasingly common to introduce operational restrictions such as a ban on take-offs and landings, either during all or part of a 24-hour period, for aircraft exceeding a certain noise threshold.

For the SAS Group it is important for our aircraft to be able to land and take off at any time of day or night, and as near to major cities as possible. Our new fleet of aircraft will now enable us to do so. Having aircraft that meet the lowest permissible noise thresholds by a good margin and emit a minimal amount of nitrogen oxides provides us with greater flexibility in making optimum use of our aircraft.

This enhances the SAS Group's position in the ongoing restructuring of the European airline market. Airlines will inevitably become fewer in number, yet I am convinced that we are one of the current European carriers that will survive this restructuring.

In this regard I would like to point out a hitherto little noticed aspect of the deal between the SAS Group and Braathens. Whereas the focus has been on the acquisition possibly giving the SAS Group a dominant position in the Norwegian domestic

Bookmarks in article

- Our goals remain firm
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Read also

- This is Braathens

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market, the fact that the deal will also yield substantial environmental benefits has been overlooked. The Norwegian media have previously criticized us for flying wing to wing with half-filled planes. Henceforth we will be able to coordinate our efforts, reduce the overcapacity that has existed so far and thus increase efficiency. If SAS Airline and Braathens together successfully achieve the same cabin factor as SAS Airline has historically had on Swedish domestic flights, it will mean considerably lower fuel consumption, less carbon dioxide emissions and major cost savings.

Award-winning environmental reporting

Another positive event in 2001 was that the SAS Group was awarded more distinctions than ever before for its environmental report. The SAS Environmental Report 2000 won first prize for the best environmental report in both Denmark and Norway. In Sweden it received the highest score of all in Deloitte & Touche's annual audit of environmental reports, including the mention: "an environmental report of international top-class." We are also happy to note that Braathens received an honorable mention for its environmental report in the Norwegian competition.

In Sweden, Denmark and Norway the nomination committees, independently of one another, have nominated the SAS Environmental Report 2000 for the European Environmental Reporting Awards. The winner will be announced in April 2002.

The trend is to make increasingly extensive use of the Internet for environmental communication. For the past two years we have published our environmental report

Bookmarks in article

- Our goals remain firm
- Long-term growth
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Links

- Deloitte & Touche
- European Environmental Reporting Awards

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on our web site in a dynamic form. On the Internet we have been able to provide readers with more information than what is available in the printed report. This year we are going a step further by publishing the SAS Environmental Report 2001 solely on the Internet. Moreover, SAS's annual report will feature greater integration of environment-related information along with a summary of the environmental report.

The reason we chose also to provide more thorough environmental information in our annual report is that we want to give investors and other capital market players an overview of the SAS Group's most important environmental achievements. We have primarily chosen to emphasize the importance of environmental work and environment-related costs for the performance of SAS AB's share price.

Sustainable development

The international trend is also to make "sustainability" reports, i.e. reports describing the company's performance with respect to the three important aspects of sustainable development: economy, environment and social responsibility.

The SAS Group will also gradually go in this direction. We have an impact on both the global and the local community. Consequently, we are required to demonstrate social responsibility, which I believe is a totally legitimate demand. We are expected to behave and act in a manner that contributes toward sustainable development with respect to the economy, environment and community. I believe the events of September 11, 2001 underscore how important it is for not only governments and

Bookmarks in article

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non-profit organizations, but also businesses, to assume a major responsibility for creating good societies.

We have started by adopting a sustainability policy for the entire SAS Group. It states that we, i.e. all employees of the SAS Group, shall, in all we do, keep in mind the Group's economic progress as well as its environmental and social impact on society.

To ensure that the Group's sustainability policy pervades all levels of the organization, during 2002, all units of the SAS Group will establish relevant goals and strategies for working in line with this policy.

Stockholm, February 2002

Jörgen Lindegaard
President and CEO

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Read also

- A word from the Environmental Director, SAS Airline
- A word from the Environmental Director, Rezidor SAS Hospitality
- Sustainability policy

SAS Group

Key performance indicators

Environmental performance indicators, SAS Airline

	1999	2000	**2001**
Environmental index, 1996=100	88	82	**80**
Fuel efficiency, kg/100 RPK	6.1	5.7	**5.6**
Cabin factor, %	64.0	67.0	**64.7**
Carbon dioxide (CO_2) emissions,1,000 tonnes	4,164	4,095	**4,110**
g/RTK	1,470	1,447	**1,449**
Nitrogen oxides (NOx) emissions, 1,000 tonnes	14.5	14.3	**14.8**
g/RTK	5.1	5.1	**5.2**

Environmental performance indicators, Subsidiary and Affiliated Airlines

Carbon dioxide (CO_2) emissions, Braathens, 1,000 tonnes	452	419	**404**
Carbon dioxide (CO_2) emissions, Air Botnia, 1,000 tonnes	43	88	**92**
Carbon dioxide (CO_2) emissions, Widerøe, 1,000 tonnes	101	97	**95**

Environmental performance indicators, Airline Related Businesses

Percentage of employees having had environmental education, SAS Media, %	NA	NA	**83**
Average number of readers per issue of Scanorama, SAS Media	16	21	**22**

Environmental performance indicators, Rezidor SAS Hospitality

Water consumption, 1,000 m^3	2,460	2,822	**2,462**
Energy consumption, GWh	390	409	**392**
Carbon dioxide (CO_2) emissions, tonnes	NA	NA	**6.13**
Unsorted waste, 1,000 tonnes	NA	NA	**12**

Read also

- Key performance indicators, SAS Airline
- Key performance indicators, Subsidiary & Affiliated Airlines
- Key performance indicators, Airline Related Businesses
- Key performance indicators, Rezidor SAS Hospitality

A shocked and changed market

Already in April 2001 the first signs of a global recession appeared in the form of a slight reduction in the number of business class travelers. This downswing later took a sudden and dramatic turn for the worse in the wake of the terrorist attacks on September 11.

The travel industry is extremely sensitive to the world situation. Both the airline and the hotel industries are strongly affected by political conflicts, social unrest and environmental disasters. All such factors result in less travel.

Both the airline and the hotel industries are also strongly affected by the price of fuel, electricity, water and waste disposal. Oil prices in particular fluctuate sharply, depending on political factors.

According to estimates by the UN International Civil Aviation Organization (ICAO), passenger and cargo air traffic declined by 6% in 2001 compared with 2000. By comparison, the previous forecast was an increase of approx. 5%. 2001 thus saw the greatest decrease in global airline business since World War II. During the Gulf War, air traffic fell by 3%.

Several airlines, which even before the attack were struggling financially, suffered acute problems resulting in shutdowns and bankruptcies. Many carriers have revised their forecasts, laid off thousands of employees and grounded a large number of aircraft. In SAS Airline's case, 3,500 employees have been given notice and 21 aircraft have been taken out of service, whereas Braathens cut its service by

The SAS Group

20%, equivalent to seven aircraft and more than 900 full-time employees.

Discount carriers are among those who have weathered the crisis best. As a rule, they have a totally different operational and cost structure that allows them to break into new markets. For instance, they have been able to lease or purchase used aircraft at low prices. They have also been able to negotiate favorable terms for the use of secondary airports and have also gained access to major airports because traditional airlines have curtailed operations. One example of the competition between secondary airports and major airports is that in early 2002 the media reported that one of the discount airlines paid sensationally low airport charges at Västerås airport. SAS has therefore reported the airport to the Swedish Competition Authority, citing Västerås airport for practicing discriminatory price-setting and allowing taxpayers and other airlines to subsidize the establishment of a discount airline in Västerås.

Discount airlines aim their business primarily at the leisure market, have a limited number of flights, most often from outlying airports, and offer a lower level of service. Consequently, they can keep their costs low. Several of them have in a short time succeeded in building up a relatively large financial base.

The recession has led companies to revise their travel budgets. People are avoiding air travel and many business travelers are now booking cheaper seats or flying on discount airlines whenever possible. For SAS Airline, business travelers flying business class have been financially its most important group of customers. Therefore it has started to tailor its services to the new priorities of this clientele. One of

Bookmarks in article

- A shocked and changed market
- Economic upswing by the end of 2002
- Sharpened focus on brands
- Sustainable development
- Global Compact

Links

- Västerås airport
- Konkurrensverket, Sweden

The SAS Group

the ways SAS Airline is dealing with its low-fare competition is to offer similar flights with a higher level of service.

Economic upswing by the end of 2002

Many economic analysts and forecasters believe the airline market will start recovering toward the end of 2002. For example, the Swedish Civil Aviation Authority (SCAA) has forecast that the number of air passengers will decline by about 10% during 2002 compared with the year before. The SCAA predicts an upturn toward the end of 2002 – brought about by an economic upswing. SAS shares this view.

SAS has suffered its greatest decline (25%) in the business traveler segment, but believes it is highly unlikely that Scandinavian business travel will remain at this level throughout 2002. Even a small increase in the number of business travelers will have a major impact on results.

Uncertain forecasts

In its study of the civil aviation sector's impact on the global climate, IPCC estimated in 1999 that air traffic would increase by an average 5% per year until 2015. The IPCC estimated that it would be possible to limit the increase of aircraft emissions of carbon dioxide – the most important greenhouse gas – to 3% per year through a gradual changeover to more modern aircraft with more efficient engines and lower fuel consumption.

Bookmarks in article

- A shocked and changed market
- Economic upswing by the end of 2002
- Sharpened focus on brands
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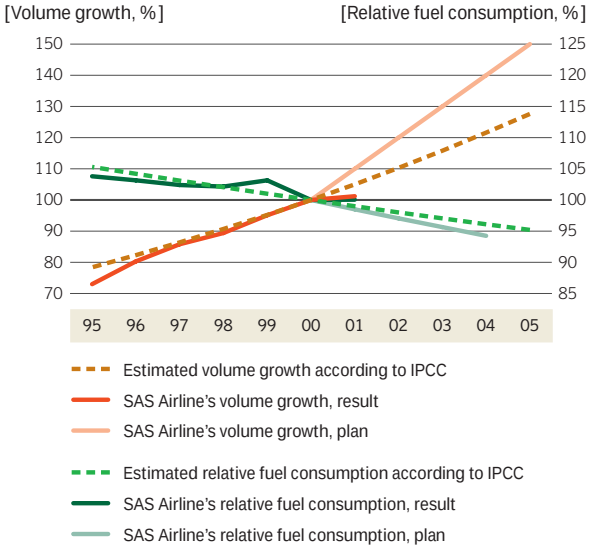
Read also

- SCAA
- IPCC

The SAS Group

Index for volume growth and relative fuel consumption



The figure illustrates the increase in the volume of aviation and fuel consumption predicted by the UN Intergovernmental Panel on Climate Change (IPCC). It is compared with SAS's estimated volume increase and fuel consumption for the same period.

Like the rest of the airline industry, SAS shares the IPCC view. However, because of the recession, compounded by the terrorist attacks in 2001, the airline industry now believes the growth curve will fluctuate before rising again once the global economy starts to recover. Till now, traffic growth and economic growth have more or less gone hand in hand.

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Environmental aspects

The SAS Group's main environmental impact stems from noise as well as energy and fuel consumption. The latter is connected with global environmental problems such as climatic changes and local acidification and eutrophication.

Everything concerning the climate issue is thus of key importance to SAS. True, the connection between greenhouse gas emissions and climate change is the subject of scientific debate, but SAS has chosen to follow a precautionary line by assuming that carbon dioxide emissions do have an impact on global climate.

Since there is a direct correlation between reducing carbon dioxide emissions from aircraft engines and aircrafts fuel consumption, SAS's effort – for economic reasons – to keep fuel consumption low coincides with the environmental aim of minimizing carbon dioxide emissions. Similarly, Rezidor SAS Hospitality has reason to minimize electricity and other energy consumption in every possible way.

Demands and expectations

In pace with deregulation and economic globalization, there is growing demand for major companies in particular to shoulder greater social responsibility. One argument is that among the world's 100 largest economies there are 51 corporations and 49 countries. Another argument is that it is primarily multinational corporations that are the winners from globalization because they can benefit from the system and locate operations in countries or regions with cheap labor and favorable tax policies.

Bookmarks in article

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At the same time, there is mistrust among a growing number of people as to the sincere willingness of business and industry to bear greater social responsibility. New national and international organizations have been founded that are highly critical of the globalized economy and multinational corporations.

Environmental and human rights organizations are continuously monitoring corporate behavior. Reports of improprieties spread quickly. A bad reputation concerning environmental impact or social conditions can have immediate and negative consequences for a company's bottom line. Such reports may concern child labor, poor working conditions or other misdeeds. In many cases it is because of subcontractors who have not done their job, but that doesn't matter – the revelation of discrepancies just as often affects the principal contractor.

This is one reason companies require subcontractors to maintain certain environmental, ethical and social standards. The travel industry is also subject to such requirements, including the SAS Group, which is a provider of airline and hotel services.

Moreover, all companies that have introduced a certified environmental management system according to ISO 14001 or are registered with EMAS must see to it that all their subcontractors have an environmental commitment on a par with their own company's ambitions and that they have a system for managing and following up their environmental work.

The number of customers wanting to know how great an impact air cargo or their employees' air travel have on the environment has increased greatly in recent years, in pace with the fact that more and more companies are introducing the environ-

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Links

- ISO
- EMAS

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mental management system ISO 14001. SAS has therefore developed a calculation model for emissions, which is posted on the company's website. You can visit this site to have your specific emissions picture calculated.

Some of SAS Airline's major customers have gone so far as to conduct audits to make sure their travel providers live up to the environmental efforts promised in their offers.

One major customer has moreover made an internal environmental and quality ranking of all the travel service companies it uses, i.e. hotels and all transport providers, from airlines to car rental agencies. SAS did well in the ranking.

Sharpened focus on brands

Consumers are increasingly expected not only to look at the product itself, but also what the company behind it stands for. The development and protection of the SAS Group's brands have consequently taken on greater importance for the Group since it has become more important for companies to share their assessments with their customers and stakeholders.

Sustainable development

The business sector has implemented various measures for meeting outside demands and expectations regarding greater social responsibilty, for instance, by founding organizations such as the World Business Council for Sustainable Development (WBCSD) and by utilizing Global Reporting Initiatives (GRI) guidelines in their environmental reporting.

Bookmarks in article

Read also

- Diagram, environmental image

Links

- Emissions calculator
- WBCSD
- GRI

The SAS Group

The mission of the WBCSD, which has 150 member companies, is to make business enterprises aware of their role in sustainable development. In particular, the WBCSD takes up issues such as ecoefficiency, innovations and corporate social responsibility.

The GRI was formed by the United Nations Environment Programme (UNEP) in collaboration with the non-profit organization CERES. The GRI's main task is to draw up guidelines for reporting on the environment-related, economic and social dimensions of efforts by businesses to foster sustainable development, i.e. development that is in keeping with Agenda 21, which was established at the UN Conference on Environment and Development held in Rio de Janerio in 1992.

SAS is following with great interest the work done by the WBCSD as well as the GRI. For example, the ideas behind the WBCSD's ecoefficiency project are reflected in SAS Airline's environmental index. SAS uses the Deloitte & Touche "Checklist for establishing and evaluating voluntary reports." This checklist in turn follows GRI guidelines.

Like its business units and various companies, the SAS Group conducts an ongoing dialogue with various stakeholders. Besides customers, suppliers, politicians and authorities, it has dialogues with environmental and human rights organizations. In these dialogues, SAS raises the issues that are most important to the Group, e.g., by making it clear that fuel consumption and the combustion process in aircraft engines are the most overshadowing environmental problem for SAS.

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- A shocked and changed market
- Economic upswing by the end of 2002
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Links

- UNEP
- CERES
- Agenda 21
- Deloitte & Touche

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Global Compact

At the World Economic Forum in Davos in 1999, UN Secretary General Kofi Annan launched the Global Compact – a collaboration between the UN and the business world. The Global Compact includes nine principles for promoting human rights, improving working conditions and protecting the environment.

These principles are based on fundamental international agreements on human and democratic rights, primarily as formulated in a number of UN documents. These were originally intended for countries to follow. However, now that companies have grown so big and influential that their revenues exceed the gross national product of entire countries, it has become increasingly evident that companies, too, must bear a larger social responsibility.

The Global Compact and the GRI have entered into a formal collaboration. Both initiatives are voluntary and complement each other to such an extent that the GRI may be described as a practical expression of what should be included in a company's account of how they are living up to the principles of the Global Compact. Companies can use their involvement in the GRI as an example of their commitment to the Global Compact.

SAS supports the initiative and regards itself as living up to all nine principles, but has so far not taken any active steps to report further details of its efforts to comply with these principles. The nine principles coincide with the SAS Group's sustainability policy as well as the ethical principles expressed in SAS's internal strategy book. This will be revised in 2002.

Bookmarks in article

Links

- Global Compact

The SAS Group

In early 2002 the Swedish government took the initiative to establish the Swedish equivalent of the UN Global Compact, Globalt Ansvar – Swedish Partnership for Global Responsibility. It is described as a joint effort to encourage Swedish companies to be ambassadors for human rights, acceptable economic conditions and a healthy environment. A number of Swedish companies, SAS included, were asked to participate.

The travel industry and the economy

In the globalized economy the travel industry, and hence the entire SAS Group, is a vital link. By facilitating communication and transport, the industry contributes toward increased value creation for individual businesses as well as for SAS's three home countries. For example, SAS is one of Denmark's biggest employers.

Just how vital civil aviation is to the economy and employment became clear after September 11. During the following two months, between 150,000 and 200,000 jobs disappeared in the global airline industry. That, in turn, is having repercussions in that airlines generate employment in the affected local communities. It is commonly assumed that, by and large, a single airline employee provides jobs for at least two other people in the aviation, tourism and travel industries.

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- A shocked and changed market
- Economic upswing by the end of 2002
- Sharpened focus on brands
- Sustainable development
- Global Compact

Read also

- The world around us, SAS Airline
- The world around us, Rezidor SAS Hospitality

Links

- Swedish Partnership for Global Responsibility

Environmental management report

Due to the recession and the acts of terrorism on September 11, travel dropped precipitously, affecting the entire SAS Group, but particularly the airline business. The crisis has created considerable overcapacity among airlines. At the turn of 2001-2002, between 1,500 and 2,000 of the world's aircraft stood parked on the ground. Several airlines have suffered acute financial difficulties and have either ceased operations or been bought up by competitors.

Environmental impact

The airline business accounts for approx. 86% of the SAS Group's total environmental impact. This impact stems chiefly from the use of fossil fuels, the combustion of which increases atmospheric carbon dioxide, contributing to global climate change. Aviation fuel combustion also emits nitrogen oxides, which contribute to local acidification of soil and water. Aircraft also produce noise, a local environmental problem.

Hotel operations and other businesses account for 12% and 2% respectively of the Group's total environmental impact, chiefly because of energy and water consumption, but also through consumption of materials and chemicals as well as waste generation.

Business events

In December 2001 the deal between SAS and the Norwegian airline Braathens was

Bookmarks in article
- Environmental impact
- Business events
- Organization
- Management and follow-up
- Ethics and social issues
- Infringements, incidents and disputes

Read also
- In and out

Links
- Braathens

The SAS Group

finalized, by which the company is wholly owned by the SAS Group but will continue to operate under the Braathens name.

The deal affords considerable environmental benifits, particularly in the Norwegian domestic market. The merger will help to reduce the overcapacity prevailing till now. If SAS and Braathens in concert achieve a higher cabin factor in Norway, lower fuel consumption, less carbon dioxide emissions and large cost savings will result.

A deal was made in the autumn of 2001 to increase ownership of Spanair from 49% to 74%. Spanair's environmental impact will, however, not be taken in account until 2002.

In 2001 SAS was the subject of intense media scrutiny in Scandinavia. The reports dealt primarily with allegations that safety was being neglected. Although groundless, the reports had to be dealt with. In this instance SAS benefited greatly from having reported on everything openly and honestly in its environmental report, including incidents and less than favorable environmental results. Reporters were quickly provided with the facts, and SAS representatives were more easily able to deal with the criticism.

For detailed information on important events in 2001, see the respective business area or unit.

Organization

A new Group structure and management organization was adopted in May 2001 when the new President and CEO took over. The Group Management (GM) com-

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Links
- Spanair

The SAS Group

prises five persons, including the President and CEO.

Since May 2001 Group operations have been grouped into four business areas. Besides GM, there are staff functions and support functions. The latter have also become independent business units and given a mandate for environmental responsibility. Coordination of environmental matters is done by the staff function Government and External Relations (GER). GER is responsible for coordinating all extra-corporate relations, i.e. infrastructure, environment, contacts with authorities and other matters concerning the Group's social responsibilities.

Up to mid-2001 coordination of environmental work and environmental reporting did not take place at the Group level, but was conducted by the respective companies or business units. Consequently, various collection and calculation methods for environmental data were used.

Starting in 2002, however, all environmental work will be coordinated at the Group level and a uniform reporting system will be adopted. This will make it possible in coming years to present aggregate environmental data at the Group level.

Management and follow-up

All units have been directed by Group Management to formulate in 2002 operational goals for their business area's environmental work, based on the new Group-wide sustninatility policy adopted in February 2002. This is supported by an implementation policy and a new environmental policy. Over the coming year the sustninatility development policy will be complemented with a real-time analysis and a

Bookmarks in article

Read also

- Organization and process, SAS Group
- Reporting principles
- Sustainability policy

The SAS Group

policy on ethics and social responsibility.

SAS's Environmental Index, which currently only covers SAS Airline, became an even more important management tool in 2001 and is reported to GM twice a year. In 2001, the SAS Group began using a Balanced Scorecard (BSC) in the management of its operations. SAS Airline's management team has introduced an environmental performance indicator in its BSC.

Ethics and social issues

In the autumn of 2001, the Group staff function Government and External Relations, GER, launched a project entitled SAS's Role in Society. The work is being carried out by a broad-based group whose assignment is to define and discuss where SAS stands today, the expectations of the world community and the role SAS plays and should play in society.

SAS's and Maersk Airs' violation of EU competition rules and the heavy fines issued by the European Commission, brought to the fore the need for an ethical discussion in the SAS Group. In the autumn of 2001 the Competition Law Compliance Program was introduced to provide training for affected employees in competition-related issues.

Infringements, incidents and disputes

None of the airlines under the SAS Group umbrella were guilty of any reportable emissions or contamination incidents of significance. No operations were involved in any disputes. On the other hand, there were several violations of local time restric-

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- Environmental impact
- Business events
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- Infringements, incidents and disputes

Read also
- Environmental Index, SAS Airline

Links
- Maersk Air

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tions or takeoff and approach paths at airports. Air Botnia in particular has often broken Gardermoen's rules that only permit landings of Chapter 2 aircraft between 8 a.m. and 4 p.m.

Rezidor SAS Hospitality's hotel operation Radisson SAS has been cited by the authorities in Düsseldorf for not complying with the city's building and safety codes. This has resulted in a program of action leading to investments worth approximately MDEM 15.

After several cases of Legionnaire's disease, some fatal, legionella bacteria were traced to the ventilation and air-conditioning system at the Radisson SAS Hotel Atlantic in Stavanger. Based on what has come to light so far, the hotel has followed all applicable regulations and maintenance routines. Moreover, the hotel has not been charged, fined or taken to court. In a press release, Radisson SAS made it clear that it intends to take responsibility if it is proved that the hotel is liable for the incident.

Bookmarks in article

- Environmental impact
- Business events
- Organization
- Management and follow-up
- Ethics and social issues
- Infringements, incidents and disputes

Read also

- Environmental management report, SAS Airline
- Environmental management report, Rezidor SAS Hospitality
- This is Air Botnia

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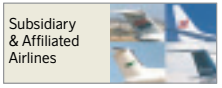
Organization and process

A new Group structure and management organization was adopted in May 2001 when the new President and CEO took over. SAS's Group Management (GM) comprises five persons, including the President and CEO. Besides GM, there are staff functions and support functions. The latter have also become independent business units and given additional environmental responsibility.

The SAS Group is now divided into four business areas: SAS Airline, Subsidiary & Affiliated Airlines, Airline Related Business and Rezidor SAS Hospitality.



Basis for the SAS Group's environmental work

Environmental goals and strategies are adopted yearly by SAS's Group Management (GM). Apart from business strategies, their decisions are based on the assessment of the significant environmental aspects of the Group's operations.

Bookmarks in article

Read also

- Organization and process, SAS Airline
- Organization and process, Subsidiary & Affiliated Airlines
- This is Airline Related Businesses
- Organization and process, Rezidor SAS Hospitality

SAS Group

The SAS Group has adopted a sustainability policy that sets forth the Group's goals in contributing to sustainable development. All operations will successively be incorporated into this policy. A new environmental policy has also been formulated.

The SAS Group's environmental organization

Environmental matters fall under the staff function Government and External Relations (GER). GER reports to a management group consisting of three persons from GM: Marie Ehrling, Chief Operating Officer and Accountable Manager for SAS Airline; Gunnar Reitan, Chief Financial Officer, and Henry Sténson, Senior Vice President Communications. The latter is head of GER's management and is thus responsible for environmental issues in GM.

GER deals with issues affecting extra-corporate relations, i.e. infrastructure, environment, contacts with authorities, framework conditions for aviation and other matters affecting the SAS Group's social responsibility. The responsibility for environmental issues has thus been broadened and they have assumed their natural place among other matters affecting the Group's relations with the outside world.

Practical responsibility for environmental matters lies with the environmental department at GER. This consists of an environmental director and two environmental advisers, of which one position was added in the autumn of 2001. The environmental department at GER also functions as the environmental staff for SAS Airline.

In addition, there are persons with special responsibility for environmental matters in the Group's various companies and units. In companies where environmen-

The SAS Group

tal matters are of great strategic importance, these people have environmental matters as their chief responsibility.

Previously the SAS Group's environmental work was coordinated via the SAS Environmental Forum. In 2002 this will be replaced by new formal groups at various levels as well as new groupings of networks focused on environmental issues. These may be the environmental directors at the respective business units, or people involved in purchasing, for example.

Environmental management and follow-up

Environmental work is an integral part of overall management, which is why SAS does not have a separate environmental management system. SAS's environmental work is based on local operation plans in which goals, strategies and activities are decided on the basis of the unit's most significant environmental impact. The local action plans are continually followed up during the year.

SAS's Group Management (GM) receives SAS Airline's Environmental Index every six months. The goal is for this index to be developed to encompass all units in the Group that are important from an environmental standpoint.

Environmental work is followed up annually by the environmental department in conjunction with the compilation of data for the environmental report. Since 1999 this data has been collected in a database that facilitates year-on-year comparisons.

Environment is also part of the internal audits that are regularly conducted, particularly in airline operations. These are done by the national Health, Environment and Safety (HES) departments within the SAS Group.

Bookmarks in article

Read also

- Environmental Index, SAS Airline

The SAS Group

Internal information and training

Besides the environmental report, information on the SAS Group's environmental work is communicated via in-house publications and the company's intranet.

All business units and companies are responsible for ensuring that their respective employees receive the necessary environmental training, based on the needs of the respective employee.

Sustainability policy

In order to contribute to sustainable development, SAS Group employees must take the Group's economic development into account in their daily work as well as its environmental and social impact.

For the SAS Group sustainable development means a parallel focus on financial growth, environmental improvements and social responsibility. The Group's task, based on its core values, is to create long-term growth in value for its shareholders. This requires making environmental and social responsibility as well as respect for cultural diversity an integrated part of business activities. The maintenance and development of employee skills and commitment are of great importance in attaining the Group's goal.

Environmental policy

SAS shall contribute to sustainable development by minimizing its environmental impact and optimizing its consumption of Environmental strategy

Bookmarks in article

Read also

- Environmental policy, SAS Airline
- Environmental policy, Rezidor SAS Hospitality

The SAS Group

Implementation strategy

In order to ensure that the SAS Group's policy to contribute to sustainable develop permeates the entire organization at all levels, each unit will develop relevant goals and strategies in line with this policy.

Environmental strategy

- A methodology is to be drawn up for ensuring that all Group decisions take into account environmental consequences.
- An environmental management system based on the principle of constant improvement is to be introduced.
- A methodology and climate are to be created to guarantee employee interest and commitment to the Groups environmental efforts.
- There is to be an evolving dialog with suppliers to reduce environmental impact.
- A system is to be created for ensuring that the best commercially available technology (EBAT) is utilized.
- Environmental standards are to be developed that are at least on par with our competitors' and that take into consideration applicable laws and regulations.
- SAS is striving for an open and honest dialog regarding its environmental work.

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The SAS Group

In and out

Resource use and environmental impact

On the next pages is an overview of SAS's main environmental impact and how it arises. The form is divided into the Group's three main areas: Airline, hotel and other operations, with airline operations accounting for 86%, hotel operations for 12% and other operations for 2% of the SAS Group's total environmental impact.

The calculations have been made from the total environmental impact of the separate sectors. Airline operations, which account for the single largest environmental impact of the Group, is divided into these three areas, flight, cabin and ground operations, of which flight has the largest weighting, 90%, and cabin and ground operations each have 5%. This weighting is also the basis for the weighting between the three different indices that make up SAS Airline's total environmental index.

The SAS Group annually consumes large quantities of non-renewable energy, primarily in the form of jet fuel, but also for heating and other operations. Energy consumption, in turn gives rise to a global environmental impact in the form of climate change and contributes locally to eutrophication and acidification of the soil and water. Other major input factors and their environmental impact are shown in the diagram.

Bookmarks in article

The SAS Group

Airline operations

IN

Flight
- Fuel
- Engine oil

Flight accounts for 90% of airline operations' environmental impact

- Carbon dioxide (CO_2)
- Nitrogen oxides (NOx)
- Hydrocarbons (HC)
- VOCs
- Oil aerosols
- Jettisoned fuel
- Noise
- Water vapor

Flight accounts for 77.4% of the Group's environmental impact

OUT

IN

Cabin
- Food and beverages
- Packaging
- Disposable/ semi-disposable items
- Articles for sale
- Newspapers
- Chlorinated water
- Germicides

Cabin accounts for 5% of airline operations' environmental impact

- Organic wastes
- Packaging
- Unopened beverages
- Articles for sale
- Solid waste
- Lavatory waste

Cabin accounts for 4.3% of the Group's environmental impact

OUT

IN

Ground
- Glycol
- Water
- Halons and freons
- Maintenance materials
- Energy
- Office supplies

Ground accounts for 5% of airline operations' environmental impact

- Solid waste
- Hazardous waste
- Wastewater
- Halons, freons
- Sulfur dioxide (SO_2)
- Carbon dioxide (CO_2)
- Nitrogen oxides (NOx)
- Hydrocarbons (HC)
- VOCs
- Soot and particulates

Ground accounts for 4.3% of the Group's environmental impact

OUT

Bookmarks in article

- Resource, use and environmental impact
- Flight operations
- Hotel operations
- Other operations

Read also

- In and out, SAS Airline
- Accounts, SAS Airlines
- Accounts, Subsidiary & Affiliated Airlines

The SAS Group

Hotel operations

IN

- Water
- Energy
- Food and beverages
- Chemicals/ Hazardous materials
- Maintenance materials
- Office supplies
- Disposable items
- Newspapers, brochures

- Wastewater
- Sulfur dioxide (SO_2)
- Carbon dioxide (CO_2)
- Unrecyclable waste
- Nitrogen oxides (NOx)
- Soot and particles
- Hazardous waste
- Organic waste
- Hydrocarbons (HC)
- Packaging

Hotel operations account for 12% of the Group's environmental impact

OUT

Other operations

IN

- Water
- Energy
- Supplies

- Wastewater
- Emissions to the atmosphere
- Solid waste
- Hazardous waste

Other operations account for 2% of the Group's environmental impact

OUT

Bookmarks in article

Read also

- Accounts, Rezidor SAS Hospitality

Reporting principles

Ownership and organization

Since July 6 2001, the SAS Group has been traded as a single share through SAS AB on the Copenhagen, Oslo and Stockholm stock exchanges. The main owners of SAS AB are the Danish, Norwegian and Swedish states, which own 14.3%, 14.3% and 21.4%, respectively, of the shares and voting rights. The remaining 50% of the shares and voting rights are owned by private interests.

The Group is divided into four business areas:

- SAS Airline
- Subsidiary & Affiliated Airlines
- Airline Related Businesses
- Rezidor SAS Hospitality

Scope of environmental report

As stated below uniform reporting principles for reporting environmental data could not be applied to all Group companies in the environmental report for 2001. The differences will be attended to in 2002.

SAS's ambition for the environmental report, the summary of the environmental report in the SAS Group's annual report for 2001 and other environmentally related information in the annual report, is to include all significant factors required to provide readers with an accurate picture of SAS's environmental impact and its commercial consequences.

The SAS Group

In accordance with generally accepted accounting practices, SAS also reports significant events occurring after the end of the financial year and before completion of the environmental report.

Reporting principles

The SAS Environmental Report 2001 includes reporting of information on significant environmental effects from all subsidiaries in the four business areas. Because the company did not apply common calculation methods and reporting principles in 2001 it has not been possible in this year's environmental report to report aggregate environmental data at the Group level.

Nor has it been possible to report environmental data for all units in the Group because of the lack of a uniform Group-wide data collection system for environmental data. The SAS Environmental Report 2001 is therefore limited to environmental data at the company level and at the business unit level for the business units SAS Airline and Rezidor SAS Hospitality. A uniform Groupwide system for environmental management and environmental reporting will be introduced in 2002 and SAS's ambition is to apply uniform calculation methods and reporting principles in future reports.

Division of environmental data between the annual report and the environmental report

The SAS Group's annual report for 2001 provides a general account of the Group's environmental status pursuant to Swedish legislation regarding disclosure of envi-

Bookmarks in article

Links

- Bokföringsnämnden

The SAS Group

ronmental information in the board of directors' report. In addition to this, environmental information has been integrated into the annual report where appropriate in order to provide a more complete picture of operations.

This year a summary of the environmental report has been included in the annual report. The idea is to provide investors and other equity market actors with a relatively comprehensive and easily accessible overview of SAS's most important environmental performance, in close proximity to the other information in the annual report. SAS's primary aim in the summary is to point out the impact of environmental work and environmentally related costs on the value of SAS shares. The complete report of SAS's environmental work and achievements in 2001 is presented in this environmental report.

The principles applied for reporting financially related information in SAS's environmental report for 2001 are identical to those used in the SAS Group's annual report.

In certain cases, data referring to the same area differs between the environmental and annual reports. The differences, which primarily refer to production and traffic data, are attributable to the fact that the reports have different operational boundaries. In cases of divergence from the specified boundaries for reporting of environmental data, information about the deviation is provided in direct connection with the relevant data, table or chart.

Although SAS's environmental report is published in Danish, Norwegian, Swedish and English, the Swedish version is regarded to be the original.

The board of directors' report in the SAS Group's annual report was approved by

Bookmarks in article

Links

- The SAS Group Annual Report 2001

The SAS Group

the Board of Directors of SAS on March 13, 2002. At the same time the Board studied the summary of the environmental report and other environmentally related information included in the annual report. The detailed environmental information in this report has been approved by the SAS Group Management but has not been examined by the Board.

Changed reporting and calculation principles

The following changes have been made in reporting and calculation methods compared with previous years:

- The term SAS in this report refers to the SAS Group.
- Beginning this year SAS is using new and more stringent definitions of the external environmental costs paid by the Group. The reported environmental costs in this year's environmental report are based on the new definitions described below. Costs from previous years have been recalculated on the basis of the new definitions.
- The SAS Environmental Report 2001 covers the entire SAS Group, with, however, the limitations that ensue from the fact that a uniform calculation and reporting system is lacking, while previous annual reports mainly provided accounts for SAS Airline and some of the companies now included under Airline Related Businesses.

The SAS Group

Calculation principles for SAS Airline

Reported environmental information for SAS Airline 2001 is based on the following coefficients and calculation principles.

Coefficients:

- The formula for distance flown used in calculation of the production ratios ATK, RTK, ASK and RPK is based on the distance between SAS's destinations, expressed as the great circle distance (GCD), the shortest distance between two points, multiplied by the number of flights between them. But since the flight distance increases when aircraft are stuck in holding patterns and the flight path does not always follow the shortest distance between the two points, the actual distance flown is approx. 10% longer than GCD.
- Calculation of RTK is based on the weight of paid cargo, the number of paying passengers and the average passenger weight including baggage. The following standard weights have been used in SAS's environmental report for 2001:

– Standard weight, intercontinental routes: 99 kg
– Standard weight, European routes: 97 kg
– Standard weight, domestic routes: 95 kg

The following coefficients have been used:

- Weight of 1 liter jet fuel: 0.79 kg
- Emissions of CO_2: 3.15 kg per kg jet fuel burned
- Emissions of SO_2: 1 g per kg jet fuel burned

The SAS Group

- Emissions of NOx: 55.2 g per km flown[1]
- Emissions of HC, excluding VOCs: 5.6 g per km flown[1]
- Emissions of water vapor: 1.238 kg per kg jet fuel burned
- 1 kg LPG: 12.8 kWh
- 1 kg fuel oil: 12.0 kWh, 3.17 kg CO_2, 5 g NOx, 0.9% SO_2
- Average density of solvents: 0.8 kg/l

The calculations are based on 365 days per year.

[1] *Factors that are specific to each airline based on the composition and patterns of operation in the aircraft fleet.*

Calculation of environmental index for SAS Airline

The overall environmental index for SAS Airline is a weighted average of the indexes for the three areas of operations: flight, cabin and ground. The index is a method for describing SAS Airline's overall ecoefficiency.

The following weightings have been used:

Area of operation	Weighting
• Flight operations:	90%
• Cabin operations:	5%
• Ground operations:	5%

The SAS Group

Flight operations account for the bulk of SAS Airline's environmental impact and have therefore been given the preponderance of the weighting. Flight operations are responsible for an estimated 90% of the total impact of reported operations. The remaining 10% is divided equally between cabin and ground operations. Calculation of the respective operation's share of SAS Airline's environmental impact was done by assigning specific costs to the different types of environmental effects of the various operations and then obtaining a weighting corresponding to the share of the total costs for the respective operation.

The environmental index (ecoefficiency) for the areas of operation is calculated in two steps:

$$\text{Environmental impact} = a\,x\,\frac{\text{Variable 1}_{\text{current year}}}{\text{Variable 1}_{\text{base year}}} \ldots + n\,x\,\frac{\text{Variable Z}_{\text{current year}}}{\text{Variable Z}_{\text{base year}}}$$

Where a...n is the assigned weighting (see below) and 1...Z is the significant environmental aspect in question.

$$\text{Environmental index} = \text{Environmental impact}\;X\,\frac{\text{Production}_{\text{base year}}}{\text{Production}_{\text{current year}}}$$

The lower the value, the lower the environmental impact per unit produced.

Bookmarks in article

- Ownership and organization
- Scope of environmental report
- Reporting principles
- Division of environmental data between the annual report and the environmental report
- Calculation principles for SAS Airline
- Calculation of environmental index for SAS Airline
- Terms and definitions

Read also

- Environmental Index, SAS Airline

Links

- IPCC

The SAS Group

Flight operations

Environmental aspect	Weighting	Production factor
• Carbon dioxide	50%	Revenue tonne kilometres (RTK)
• Nitrogen oxides	40%	
• Weighted noise contour	10%	

The high weightings for carbon dioxide and nitrogen oxides are based on the scientific findings summarized in the IPCC report on aviation and the global atmosphere.

Cabin operations

Environmental aspect	Weighting	Production factor
• Unsorted waste	50%	No. of meals produced
• Energy consumption	30%	
• Water consumption	20%	

The weighting for unsorted waste is based on the fact that waste volumes affect the total load weight of a flight and therefore also fuel consumption. The weighting for energy consumption is based on an average electricity mix in Scandinavia, with a large proportion of hydropower relative to the rest of Europe. The weighting for water consumption is also based on conditions in Scandinavia, where the supply of water is comparatively good.

Bookmarks in article

Read also

The SAS Group

Ground operations

Environmental aspect	Weighting	Production factor
• Energy consumption	40%	Weighted landings
• Fuel for ground vehicles	20%	
• Glycol consumption	20%	
• Unsorted waste	10%	
• Hazardous waste	5%	
• Water consumption	5%	

Energy consumption has been given the highest weighting, since SAS is a major consumer of electricity. Consumption of glycol and fuel for ground vehicles has been given relatively high weightings since they give rise to direct emissions into the environment.

Terms and definitions

Weighted noise contour

The weighted noise contour is calculated based on the number of takeoffs per day at a given airport, with regard to the aircraft types the airline uses at that airport. The weighted noise contour defines the area in km^2 that is subjected to a noise footprint of 85 dB(A) or more in connection with takeoff.

Revenue passengers

Passengers who pay at least 25% of the regular ticket price.

The SAS Group

Adjustment for volume growth

The change in the absolute value of a specific parameter, from year to year is assumed to be attributable partly to a change in the operating volume and partly to improved technology or a change in efficiency, etc. In this environmental report, "Adjustment for volume growth" means that the effects of the increased operating volume have been eliminated. This is done by adjusting the preceding year's figures by an amount equal to volume growth. The change in the parameter in question is then calculated.

Charges for the infrastructure

Charges imposed by the operators of the infrastructure and which are intended to cover operating and capital costs for airlines and air traffic management.

Environmental charges

Charges intended to cover the direct costs of environmental measures relating to airports such as the cost of noise measurement, noise measurement systems and noise protection measures including expropriation of surrounding buildings due to noise (Polluter Pays Principle). Environmental charges are normally related to the environmental properties of the aircraft. In certain cases, the charge is assessed as a passenger charge (not related to the noise source).

The SAS Group

Environmentally related charges

Charges imposed by the airport operators for the purpose of motivating aircraft operators to operate aircraft with good ecoefficiencies with respect to noise and other emissions such as of NOx and HC as well as surcharges imposed by airport operators to motivate aircraft operators to avoid takeoffs and landings at night. Environmentally related charges are included in airport revenues and not linked to any direct cost.

The methods for classifying aircraft differ between countries as well as airports within countries. Although the charges are differentiated based on the ecoefficiency of the aircraft, all in all they are balanced out in such a way as to defray some of the costs determined by the airport operator.

Environmentally related taxes

Taxes which in contrast to other corporate taxation are motivated by environmental grounds, such as the environmentally motivated passenger charge in Denmark and Norway, the environmentally related fiscal carbon tax in Norway and certain energy taxes in Denmark.

External environmentally related costs

The sum of environmental charges and environmentally related charges and taxes.

The SAS Group

Other environmentally related costs

Costs for waste management, purification plants, permits, any fines and charges for permit deviation, costs for remediation measures, etc. as well as internal reported costs for environmental work, e.g. costs for persons and organizations working with environmental protection, costs for environmental reporting etc.

Environmentally related investments

Investments in assets to prevent, reduce or correct environmental damage arising from operations that are not profitable on their own financial merits or are aimed at meeting upcoming, more stringent environmental requirements

Environmentally related provisions

Provisions for liabilities and allocations for known undertakings and requisite measures to prevent, reduce or correct environmental damage arising from operations.

Environmentally related contingent liabilities

Contingent liabilities pertaining to possible future costs for measures to prevent, reduce or correct environmental damage arising from operations.

Environmental impact of leased aircraft

Except for shipments of goods by other carriers on SAS Cargo's account, fuel consumption and emissions from leased aircraft and aircraft leased including the crew (wet lease) are included in the reported data for SAS Airline.

Bookmarks in article

The SAS Group

CFROI

EBITDAR in relation to AV.

EBITDAR

Earnings before depreciation and leasing costs. Earnings before net financial items, taxes, depreciation, share of income in affiliated companies, income from the sale of fixed assets and leasing costs for aircraft.

AV

Asset value (adjusted capital employed). Book shareholders' equity, plus minority interests, plus surplus value in the aircraft fleet, plus 7 times the yearly operating lease costs for aircraft, plus net interest-bearing liabilities, less equity in affiliated companies. Can also be expressed as the total book value of assets, plus surplus value in the aircraft fleet, plus 7 times the yearly operating lease costs for aircraft, less equity in affiliated companies, less noninterest-bearing liabilities and interest-bearing assets.

EV

Enterprise Value. Average share price (market value of shareholders' equity) with the addition of average net liabilities during the year and 7 times the yearly operating lease costs for aircraft.

13 (14)

Bookmarks in article

Read also

The SAS Group

Quality assurance

Specially appointed persons at the major units in the Group are responsible for providing environmental data for SAS's environmental report. The environmental adviser is responsible for entering the reported data into a Group-wide database at the central environmental department. In conjunction with this the data is evaluated, analyzed and compared with data in the database from previous years. Before new data goes into the database, the underlying information is examined.

SAS's external auditors examine the materiality of the information in the database against the underlying documentation and assess whether, on the basis of the underlying data, interviews with managers and a review of documents, systems and routines, the information in the environmental report provides an essentially accurate picture. The scope of the auditors' review is described in more detail in their statement.

Bookmarks in article

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This is SAS Airline

SAS Airline comprises SAS' passenger transport operations with its own aircraft and under and under its own brand. The business area includes the production company SAS Commuter and the independent business units Scandinavian Ground Services and Scandinavian Technical Services. Scandinavian Ground Services is responsible for SAS passenger and ramp services at all airports. Scandinavian Technical Services is responsible for the technical maintenance of SAS Airlines and other customers' aircraft fleets. SAS Airline was one of the founders of Star Alliance, a global network of airlines, in 1997. In addition to this, SAS Airline has a number of European partners.

Links

- SAS Airline

SAS Airline

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Highlights of 2001

- SAS Airline's Environmental Index improves by 2 points, to 80
- Total production increased by 5.1%.
- Modernization of aircraft fleet continued through the delivery of 24 new highly ecoefficient aircraft.
- SAS Airline's external environmentally related costs increased by 12% as the result of higher environmentally related taxes.
- The ongoing program for energy conservation led to a 2.4% decrease in energy use by SAS Airline's ground operations.
- SAS Airline's environmental work made a positive contribution to the SAS Group's overall image index.
- No environmentally related costs of significance due to accidents incidents, infringement's of environmental laws, contaminated proporties, disputes or complaints.

Read also

- Environmental Index, SAS Airline

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A word from the Environmental Director

Crisis may be a blessing in disguise

2001 ended as SAS's worst year ever – in every respect, financially not excepted. This has forced us throughout the Group to become thriftier with resources than ever before. Handled correctly, however, the new conditions may help us to hone our creativity and efficiency.

The most visible result of this is that we are printing and distributing as part of the annual report only a summary of the actual environmental report. Another new approach is that owing to the new Group structure, we are covering the SAS Group's environmental work overall and not just that of SAS Airline alone, even though the activities of SAS Airline are still responsible for the bulk of the Group's environmental impact. However, this year we are unable to report aggregate environmental data at the Group level, since the data collected from the various business areas, companies and units, is not comparable. It will be so in coming years. This will be possible because in order to increase the efficiency of our overall environmental efforts we have commenced the development and adoption of an environmental management and reporting system covering the entire corporation.

We have long worked on developing our environmental communication on the Internet. Last year we presented an expanded dynamic version of our environmental report on our website. This year we are going a step further, posting the environ-

Bookmarks in article

- Crisis may be a blessing in disguise
- Positive final environmental result
- Continuous improvement

SAS Airline

mental report solely on our website. Although we believe that is this the right move, depending on the reactions of our readers and stakeholders, we are prepared to reconsider our decision.

We are consequently extra eager to receive feedback – criticism or suggestions for improvement. We invite you to send your reactions by completing our survey. Unfortunately we must recognize that the crisis, which, to be sure, we saw the outline of in advance, but which hit with full force after September 11, has meant that we attained a somewhat worse environmental result that what we had good reason to hope for before then.

Positive final environmental result

However, I would like to point out that the final environmental result was still positive in that the environmental index improved by two points compared with 2000. Our goal is to achieve an average improvement of 3 points per year in the period from 1996 till 2004. Between 1996 and 2001 the index has improved 20 points, an average of four points per year.

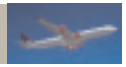
Despite all, we have reasons to be proud. One is that our SAS Environmental Report 2000 won the award for the best environmental report in both Norway and Denmark. In Sweden it got the highest marks of all in the review of voluntary reports that Deloitte & Touche did along with the Swedish Institute of Business Administration and the weekly magazine *Affärsvärlden*. The nomination committees in all three Scandinavian countries have nominated the SAS Environmental Report 2000 to

Bookmarks in article

Links

- Deloitte & Touche
- Swedish Institute of Business Administration
- Affärsvärlden
- European Environmental Reporting Awards
- Questionnaire

SAS Airline



compete in the European Environmental Reporting Awards, to be presented in April 2002 in Copenhagen.

Our success with the environmental report has also drawn attention to our environmental efforts. We have noted that we are increasingly being invited to give talks and take part in discussions in the Nordic region as well as elsewhere in Europe that deal with the airline industry and the environment or with environmental reporting. In the latter case, there is great interest in our efforts to develop our environmental index and our environmental performance indicators.

Continuous improvement

SAS has outside auditors examine its environmental report to assess whether it gives a true picture of SAS's environmental work and ecoefficiency. As part of this we are in a continuing dialogue with the auditors, who point out any shortcomings or question whether reasoning and analyses agree with the figures being examined. The review by auditors also provides a basis for improvements of our internal collection process and presentation of environmental data.

Since our stated goal for all our operations, including the environmental report, is to show continuons improvement, we usually listen attentively to our auditors' criticisms. One of our responses to these this year is our further efforts to highlight the link between the Group's environmental work and its financial performance.

During 2001 SAS's in-house auditors examined both the environmental report-

Bookmarks in article

- Crisis may be a blessing in disguise
- Positive final environmental result
- Continuous improvement

Links

- Star Alliance

SAS Airline

ing process and the outside audit of the environmental report. They were satisfied with our work and only had a few minor remarks, which we now have attended to.

For several years we have tried to interest our competitors and our partners in Star Alliance in using the key performance indicators that we have developed. This was to better enable us, our customers and other stakeholders, to compare various carriers' ecoefficiency. We have made a little headway, particularly with some of our competitors. However discussions are on hold because of the recession and consequences of the act of terrorism, which have forced airlines to muster their resources for safety issues and cost-efficiency, to adapt to altered market assumptions.

I am convinced that these efforts will be resumed once the situation in the air travel market has stabilized. This also applies to the environmental cooperation within Star Alliance that came to a halt after September 11.

Returning to happier news, I would like to mention that our environmental index has become an increasingly vital management tool at SAS. It is now being reported to Group Management twice a year. From now on, parts of the Environmental Index will also be used on the Balanced Scorecards utilized in the management of flight operations at SAS Airline. Thus, the environment will become an even more distinct factor in the decision-making process at SAS from here on out.

Oslo, February 2002

Niels Eirik Nertun
Environmental Director

Bookmarks in article

- Crisis may be a blessing in disguise
- Positive final environmental result
- Continuous improvement

Read also

- President's statement
- Environmental Director, Rezidor

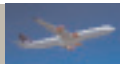
Key performance indicators

Environment and economy

Below is a summary of development for a number of key performance indicators for both environmental and economic performance.

	1997	1998	1999	2000	**2001**
Operating revenue, MSEK	36,769	38,211	40,868	39,233	**41,166**
Income before tax, MSEK	2,067	2,588	1,307	1,951	**–1,499**
Investments, MSEK	2,938	5,554	5,832	9,093	**10,227**
Number of employees	22,524	23,992	27,201	23,777	**22,364**
Cash Flow Return On Investments (CFROI), %	25	22	15	12	**5**
EBITAR, %	–[4]	–[4]	–[4]	11,0	**4.4**
Environmentally related costs, MSEK, approx.	531	911	1,128	912	**1,024**
Environmentally related costs in relation to operating revenue, %	1.4	2.4	2.7	2.3	**2.5**
Income in relation to CO_2 emissions, SEK/tonne	510	620	314	476	**–**
SAS Airline Environmental index, 1996=100[1]	97	96	88	82	**80**
Fuel efficiency, kg/100 RPK	6.2	6.2	6.1	5.7	**5.6**
Cabin factor, %	64.9	65.7	64.0	67.0	**64.7**[2]
Emissions of carbon dioxide (CO_2), 1,000 tonnes	4,021	4,167	4,164	4,095	**4,110**
g/RTK	1,517	1510	1,470[3]	1,447[3]	**1,449**[3]
Emissions on nitrogen oxides (NOx), 1,000 tonnes	5.6	5.6	5.1[3]	5.1[3]	**5.2**[3]
Unsorted waste from aircraft cabins and aircraft cleaning, tonnes	8,168	8,002	8,514	–[4]	**x**
Energy consumption in managed facilities, kWh/m²	409	354	349	345	**x**
Unsorted waste from ground operations. tonnes	3,140	3,308	2,347	3,055	**x**

[1] The lower the index, the better the ecoefficiency.
[2] The figure includes paying passengers over a certain payment limit ("revenue passengers"). The total number of passengers is approximately 10% higher. Including all passengers, SAS Airline's cabin factor for 2001 was 70.8%.
[3] Not including the RTK purchased from Lufthansa Cargo.
[4] Data not available.



SAS Airline and the world around us

The economic slowdown and the terrorist attacks of 11 September have led to what we have judged to be a temporary stagnation of the airline market. The slowdown has resulted in a change in travel habits and greater cost awareness, which has benefited the discount airlines and forced traditional carriers such as SAS Airline to reassess the services they offer to their customers.

Demands and expectations

In pace with the rapid globalization of the business sector, an increasing number of individuals and organizations are demanding that businesses shoulder a greater degree of social responsibility. Businesses are also increasingly requiring that their subcontractors achieve certain standards for environmental performance, ethics and social responsibility.

The airline industry and the economy

Besides the fact that the airline industry is of vital importance both to individual companies and the overall economy, as well as employment, it also contributes to improving the quality of life in a number of other ways. For example, the airline industry enables increased social interaction, helps keep divided families together and offers the capacity to rapidly deliver emergency supplies in the event of accidents and natural disasters.

Bookmarks in article

- The Airline industry and the economy
- IT tends to increase the demand for air travel
- Scandinavian airlines pay their own social costs
- Noise
- Congestion in the air and on the ground
- The UN Convention on Climate Change
- SAS's environmental standards contribute to engine development

Read also

- The world around us, SAS Group
- The world around us, Rezidor SAS Hospitality

SAS Airline

As an example of the economic aspects of the advantages to society offered by the airline industry, we can mention the rapidly increasing utilization of air transportation for the new economy's knowledge-intensive products. The value of these products is often high, and a systematic changeover is occurring from rail and sea transport to road and air transport in accordance with the rising specific value of products. For very expensive products, valuable spare parts, organ transportation, life saving medical equipment or fresh produce, it is the delivery speed and precision that is of decisive importance to the choice of a mode of transportation for longer distances. This means that air transportation is often chosen.

Companies often operate in many different counties as a result of the global economy. This leads in turn to an increased demand for travel, especially air travel. The economic slowdown in 2001 and the terrorist attacks showed, however, that the willingness to fly can decline rapidly in the event of economic or political unrest.

IT tends to increase the demand for air travel

The rapid evolution of information technology is influencing the airline business and people's travel patterns. IT increases the opportunities for building both private and commercial networks. It has become easier to work in real-time global networks and to sell products and services over the Internet. E-commerce, and business-to-business commerce especially, has simplified commerce over long distances, and this has in turn increased the demand for rapid transportation in particular. A great deal

Bookmarks in article

SAS Airline

of travel and meetings between people have indeed been replaced by telecommunication, which may also entail potential environmental benefits, but there is no evidence that telecommunication will yield any overall reduction in air travel.

Studies show that errands of a more trivial nature, such as bank errands or more routine contact, are being replaced by telecommunication. The need for face-to-face meetings in the creative area, such as research and development, marketing and design is increasing at the same time. Creative and intellectual processes that involve argumentation or negotiation demand physical contact, and IT is inadequate as a tool in these cases.

This is supported by a study of the relationship between the utilization of information technology and passenger transportation conducted by George Mason University outside Washington, D.C. It shows that passenger transportation declines proportionate to the increase in IT utilization, but only in regions with low-tech businesses. Passenger transportation, and air travel in particular, increases on the other hand within and to and from communities with high-tech businesses.

A report from the University of Karlsruhe in Germany indicates that the Internet in general may lead to a higher demand for travel and transportation. It points out that chat friends will want to meet in person sooner or later, that individuals surfing the Internet for tourist destinations will decide eventually to travel to these destinations, and that anyone who has learned how to find good prices for a product via the Internet will continue to make purchases on the Internet. This results in an overall higher demand for transportation, especially air transportation.

Bookmarks in article

Links

- George Mason University
- Karlsruhe University

SAS Airline

Today, information technology is fully integrated into the airline business, encompassing everything from ticket reservations to air traffic control. It has also contributed to the birth of a whole new market, discount airlines, which has grown dramatically in recent years, without stealing market shares from the traditional airlines for a long time. Discount airlines sell up to 95% of their tickets via the Internet. This allows them to keep their costs and prices down and to maintain acceptable profitability at the same time. Ticket sales over the Internet by traditional airlines such as SAS are increasing, but sales made in person still predominate.

Scandinavian airlines pay their own social costs

The Scandinavian airlines bear, in addition to their own infrastructure costs, the cost of any social or environmental damage they cause. This was the conclusion of the consultant report “The Conditions for Civil Aviation in Scandinavia”, which was published in the spring of 1999. The Danish consulting firm COWI conducted a comparative study in association with the Norwegian Institute of Transport Economics and the Swedish firm InRegia, on behalf of SAS.

Its findings were confirmed by a Norwegian research report from 2000 for a study conducted by the Norwegian Institute of Transport Economics at the request of the Norwegian ministries of communications and of fisheries and the Directorate of Roads.

The report compares the different transportation sectors’ impact on society in the form of environmental pollution, noise, accidents, traffic congestion, and infra-

Bookmarks in article

Links

- SAS Airline’s report on “The Conditions for Civil Avition in Scandinavia”
- COWI
- Norwegian Institute of Transport Economics
- InRegia

SAS Airline

structure damage. This impact is then contrasted with the taxes and charges paid by the respective sectors.

Its conclusion is that civil aviation, in addition to passenger vehicles, is the only transportation sector that pays for more than its share of the damage it has caused to society – to be precise, civil aviation has paid twice as much in taxes and charges as the costs it has caused to Scandinavian societies.

The rail, bus and streetcar sectors, on the other hand, only pay 10% of their costs to society according to the Norwegian Institute of Transport Economics. If the subsidies received by these transportation sectors were taken into account, then this percentage would be even lower.

The report from the Institute of Transport Economics was the basis for the Norwegian parliament's decision on a new national transportation plan. It may perhaps have contributed to the Norwegian parliament's decision to eliminate the Norwegian passenger tax as of April 1, 2002.

SAS Airlane would like to see a new study after the new law has been in force for a few years to determine whether there is any better correspondence between the airline industry's environmental and social costs and what it pays in taxes, charges and levies.

Policies, laws and regulations

The airline industry is regulated primarily by international agreements made within the framework of the International Civil Aviation Organization (ICAO). These deal

Bookmarks in article

Links

- ICAO

SAS Airline

with standards for noise and emissions of nitrogen oxides, for example.

Within the ICAO, which is made up of representatives of countries, unanimous decisions are required. Government representatives, primarily from developing countries and North America – the U.S. in particular – have usually sought to block mandating tightened environmental standards for aircraft, whereas representatives of EU member states have promoted such tightening.

Since the lowest common denominator has normally prevailed, EU representatives usually feel that the result of the negotiations is watered down and toothless. For example, this applies to the new noise standard the ICAO adopted in 2001.

Besides international agreements there are various national or local regulations. These may be noise restrictions for takeoff and landing or special systems of environmentally related charges.

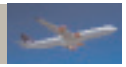
Taxes

According to an ICAO policy from the beginning of the 1950s, aviation fuel is untaxed, an arrangement under serious reconsideration, especially in Europe. There the European Commission, as well as many individual countries, environmental organizations as well as EU parliamentarians, propose levying a carbon or fuel tax on aviation fuel. In Denmark as well as Norway, civil aviation pays green taxes and passenger charges.

The Commission has stressed its preference for a global tax solution for aviation fuel, so as not to harm the competitiveness of EU-based carriers. This explains why the EU is actively pushing for economic management tools within the ICAO.

Bookmarks in article

SAS Airline



Environmental charges and environmentally related charges

For that matter, airlines are not exempt from environmental charges, but these are levied on things other than specifically fuel. There are a variety of environmental charges and environmentally related charges, in Europe especially. There, airports either imposed special environmental charges or have some of the main charges – normally the landing fee – vary according to the environmental characteristics of the aircraft taking off or landing. However, environmentally related charges need not correspond to any particular costs, but have been created to encourage airlines to fly the most ecoefficient aircraft.

One problem is that airports use different models for landing fees. For carriers this means that the same aircraft may be considered “best in class” one place, but end up in a worse category somewhere else. This makes it difficult for SAS Airline to make optimum use of its fleet in the way it would prefer.

The European Civil Aviation Conference (ECAC) ran a project aimed at creating a European model for emission charges. The project, designated ERLIG, has recently concluded and has prompted a great deal of interest. Its result suggests that in the future, countries in addition to Sweden and Switzerland will impose emissions-based landing charges, with Germany and the U.K. showing the greatest interest. The Swedish Civil Aviation Authority was a driving force on the ERLIG project, which also supported by the EU.

Bookmarks in article

Read also

- Environmentally related taxes, SAS Airline

Links

- ECAC
- The Swedish Civil Aviation Authority

SAS Airline

Noise

Noise is an environmental problem that has attracted increasing attention. Airports in densely populated areas in Europe and North America are therefore imposing noise charges, takeoff and landing restrictions, or banning the noisiest aircraft.

The UN International Civil Aviation Organization (ICAO), has devised a certification system that classifies aircraft according the noise they generate. There are four classes: uncertified, Chapter 2, Chapter 3 and Chapter 4 aircraft. All new aircraft types manufactured after April 1, 2006, must meet Chapter 4 standards. This means that they must have noise profile 10 EPNdB lower than that for Chapter 3 aircraft, which is the strictest current standard.

The EU and individual countries in Europe have long urged the ICAO to tighten noise certification standards, which they also did when the ICAO Assembly met in September 2001. Nevertheless, no plan was introduced to phase out the noisiest aircraft, a plan that representatives of the EU countries have long fought to pass.

The ICAO Assembly agreed on a compromise advocating a “balanced approach.” Instead of a general ban on certain types of aircraft, four different tools were presented that may be utilized to improve the noise situation at particularly vulnerable airports.

The tools the ICAO refers to are land use restrictions, takeoff procedures, operating restrictions such as prohibiting certain types of aircraft or hushkitting at the source, i.e. technical solutions for the affected aircraft.

The ICAO recommends that airports ameliorate their noise situations by applying

Bookmarks in article

Links

- ICAO

the tool or tools proving most effective from a "cost-benefit" standpoint, i.e., providing the most noise improvement at the lowest overall cost.

A general perception of the ICAO agreement is that it is watered down and rather vaguely written. This has given the EU certain maneuvering room to go ahead and devise stricter noise regulations that those applying in the rest of the world.

The EU adopts new aircraft noise directive

Since 1999 the EU has had a regulation intended to ban Chapter 2 aircraft from operating beginning on April 1, 2002. This regulation is now also part of national regulations. A new directive, the so-called Hushkit Directive was also to apply to registration of hushkitted Chapter 3 aircraft, that is, of Chapter 2 aircraft whose engines have been hushkitted to allow them to be re-certified as Chapter 3.

The U.S. has regarded this regulation as a trade barrier. The Americans have threatened to take severe countermeasures if the EU should actually apply this regulation. Therefore the new ICAO agreement came at an opportune moment for the EU, which in record time translated it into a new EU directive on aircraft noise, which is to replace the Hushkit Directive the U.S. criticized so much. The EU noise directive is planned to come into force on April 1, 2002.

The new noise directive means that airport operators or authorities that determine rules for airports have a certain frame around which they can impose operating restrictions on aircraft with certain noise profiles. In practice this may mean that

Bookmarks in article

SAS Airline

it will be possible to ban hushkitted Chapter 3 aircraft or set deadlines for operating aircraft that generate more noise than Chapter 3 standards, minus 5 EPNdB.

This directive will affect older Boeing 747s and DC 10s, aircraft still in active service in Europe. However, neither SAS Airline nor the carriers in the SAS Group have such aircraft in their fleets.

There is, however, a formulation in the directive that may eventually affect SAS Airline. The gist of it is that in the course of five years, the EU is going to evaluate the result of the directive and decide whether it should be tightened further. Should there be any tightening, the two MD-83s that SAS Airline has in its fleet may end up exceeding the new noise threshold. It is relevant to point out that there are some EU member states that have advocated increasing the Chapter 3 margin of 5 EPNdB to 8 or even more.

At the same time it should be pointed out that SAS Airline is currently in a stimulating dialogue with aircraft and engine manufacturers to find solutions to reduce the noise from engines on existing aircraft.

Congestion in the air and on the ground

The constantly growing air traffic is creating problems. There is dearth of capacity at many major airports, above all in Europe and North America. The recession and the act of terrorism on September 11 have only temporarily relieved the pressure.

Bookmarks in article

Links

- Eurocontrol

SAS Airline

And so the problems of congested airspace and delays remain. A report from Eurocontrol, the European air traffic management organization, reveals dramatic future capacity problems at European airports. According to Eurocontrol, within a period of ten years, there will be a lack of resources to accommodate up to 30% of required air traffic.

Because the aircraft will have to spend unnecessary time in holding patterns, the result will be substantially increased fuel consumption. Fuel consumption will also increase because aircraft also often speed up to make up for delays that arise from not being able to take off on time.

One of SAS Airline's partners in Star Alliance, German Lufthansa, has calculated that the delays affecting the airline due to lack of airport capacity mean approx. 100,000 tonnes extra fuel consumption per year, corresponding to just over 300,000 tonnes of carbon dioxide, 50,000 tonnes extra fuel are consumed while in holding patterns, and 50,000 tonnes of fuel when aircraft make up lost time. Lufthansa reports that it loses MSEK 4.85 per day on delays, 60% of which are due to infrastructure bottlenecks and a shortfall of air traffic control capacity.

In this regard, SAS Airline is fortunate compared with its European rivals. In its Scandinavian home market the aviation infrastructure is well developed and the airports in Copenhagen, Oslo and Stockholm rank generally very favorably in statistics of delays.

A lack of land and proximity to residential areas makes expansion of existing major

Bookmarks in article

Links

- Star Alliance
- Lufthansa
- Copenhagen airport
- Oslo Lufthavn AS
- Arlanda airport

SAS Airline

airports difficult or impossible. For instance, if plans are realized, Paris's new international airport will be built a whopping 120 kilometers outside the city.

Already limits have been imposed on takeoffs and landings at major airports located near European cities, often involving a total ban on nighttime takeoffs and landings.

It also happens that airports are approaching their ceilings for harmful emissions into the environment. So far this primarily applies to Arlanda, one of SAS Airline's home bases. There the total emissions of nitrogen oxides and carbon dioxide are not permitted to exceed 1990s levels when the third runway comes into service, planned to happen in spring 2002. The ceiling applies to all sources of emission in the area, not just air, but road and rail transportation as well. Road transportation and aviation are responsible for emissions of carbon dioxide and nitrogen oxides in equal measure. The Swedish Civil Aviation Authority, which fears that the emissions target will not be met, has petitioned the government for a new ceiling.

In Sweden, as in parts of the rest of Europe, especially in the U.K., there is a noticeable trend toward establishing secondary airports. These are often military airfields otherwise threatened with closure or smaller private airports located at some distance from population centers. With promises of lower charges, they naturally attract cargo or charter service or other discount carriers.

SAS Airline is attempting to deal with the problems of congestion and capacity shortages at European airports by purchasing new, larger aircraft. They have been ordered to meet new, stricter noise regulations and also have the lowest carbon dioxide emissions in their class.

Bookmarks in article

SAS Airline

Problems with air traffic control

Several carriers, including SAS Airline, have invested in technology that will make it possible to reduce current limits for the shortest permissible distance between aircraft in the air. However, it cannot be exploited in full, because the technology at airports on the Continent is not sufficiently up-to-date. And according to a study by the UN Intergovernmental Panel on Climate Change (IPCC) of the aviation sector's impact on global climate, more efficient air traffic control might also reduce fuel consumption by between 10% and 18%.

Another problem is that European air traffic control is not sufficiently coordinated. Just the fact that there are 49 different air traffic control centers, 31 national systems and that a total of 30 programming languages are used creates coordination problems.

So far, all attempts to discuss joint regulation of European airspace have met with opposition. One reason is interest clashes between civil and military aviation, but another is that, despite EU membership, many countries are defending the sovereignty of their own airspace.

The EU Commissioner for Transport and Energy Loyola de Palacio, has drawn attention to the problem by appointing a working group tasked with dealing with the problem of delays, for example. Eurocontrol has also lately begun to discuss environmental issues somewhat more actively, seeing them in part in relation to congestion and delays.

Bookmarks in article

Links

- IPCC
- ATC
- Eurocontrol

SAS Airline

Climate issue control for aircraft

Aviation's single biggest environmental impact is emissions of the greenhouse gas carbon dioxide. To be sure, the link between greenhouse gas emissions and climate change is the subject of scientific debate. Nevertheless, SAS has chosen to follow the principle of prudence and assumes that carbon dioxide emissions do impact global climate. It is therefore the utmost priority for SAS to minimize such emissions.

Since there is a direct connection between reducing carbon dioxide emissions from aircraft engines and reducing aircraft fuel consumption, SAS's efforts to hold down – for economic reasons – fuel consumption, coincide with the environmental aim of minimizing carbon dioxide emissions.

Water vapor

Water vapor has a greenhouse effect. Whereas aviation's contribution to the total water balance in the troposphere is negligible, its stratospheric emissions have an impact on climate – though to a considerably lesser extent than what emissions of nitrogen oxides and carbon dioxide do. Aircraft vapor trails cover over on average 0.1% of the Earth's surface. Such contrails have two opposite effects on climate. While contributing to cooling by blocking incoming solar radiation, they also contribute to the greenhouse effect by absorbing heat radiated outward. The net effect is slight.

Bookmarks in article

SAS Airline

The UN Convention on Climate Change

The object of the 1992 UN Convention on Climate Change, which in 1997 led to the so-called Kyoto Protocol, is for all industrialized countries to lower their emissions of greenhouse gases to 95% of 1990-levels by 2012.

This target is the result of a political compromise. In actual fact, according to the Intergovernmental Panel on Climate Change (IPCC), emissions must eventually be reduced by considerably more than that to keep the global damage due to climate change at a manageable level. Several countries, including Sweden, have declared their intention to go beyond what is required by the Kyoto Protocol.

The transportation sector is often the focus of discussions of climate impact, for obvious reasons, since it primarily utilizes fossil fuels. At the same time, the global transportation sector accounts for no more than 16% of aggregate carbon dioxide emissions. Nearly half comes from manufacturing and energy production, with 21% and 25% respectively. Of the transportation sector's 16%, road traffic accounts for 75%, ocean shipping 7%, railways and inland shipping 6% and aviation for 12%.

The Kyoto Protocol

During 2001 there were political discussions and negotiations among the parties to the climate convention. Afterward, at the UN climate conference COP7 in Marrakech in November 2001, they came to an agreement on the details of the Kyoto Protocol that sufficed to enable efforts to ratify the Protocol to get started.

The parties reached an accord on principles for and the scope of the three

Bookmarks in article

Links

- IPCC
- The Kyoto Protocol
- COP7

SAS Airline

socalled mechanisms in the protocol, emissions trading, joint implementation and clean development mechanisms. They also agreed on a “rule book” for the Kyoto Protocol, which defines, for example, how and in what units greenhouse gas emissions are to be measured and how so-called carbon sinks are to be calculated.

Thus, the parties can begin to ratify the Protocol, expected to come into force during 2002, assuming that at least 55 countries have approved it. Although the U.S., under President George W. Bush, has stated its intention not to ratify the Kyoto Protocol, it can enter into force with America’s participation.

Emissions trading

Emissions trading, also called quota trading, is the mechanism that will most obviously affect the business sector and the airline industry. The idea is that those countries that emit less carbon dioxide than permitted under the Protocol should be able to sell their unused quotas to another country. In fact it will be companies or other enterprises in the respective countries that will trade quotas, meaning that the SAS Group will be able to purchase emissions rights as needed. In the section “Environment and economy” there is a diagram explaining the impact on results connected with various price levels of emissions rights.

Initially, trading will take place within and among the industrial countries that under the Protocol are required to reduce their emissions. There is also a possibility of indirect

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Read also

- Environment and economy

SAS Airline

trading with developing countries, through the "clean development mechanism."

The trading system as a whole will come to resemble traditional share trading. It will be each country's responsibility to keep track of all its quotas. The national registers, which are yet to be created, may be likened to central securities depositories, which record purchases, sales and holdings of shares, etc.

A central register will be established within the framework of the UN Convention on Climate Change to make sure that each country meets its commitment under the Kyoto Protocol.

Due to the great interest in quota trading, for several years now, a number of pilot projects have been ongoing. The World Bank manages something called the Prototype Carbon Fund (PCF), in order to develop quota trading between industrial and developing countries.

Denmark has introduced a trading system for electric power companies. In the U.K. a voluntary system is being started for emissions trading during 2002. Norway is also developing a quota trading system, which in all probability will also include the transportation sector. The Norwegian system may be in place in 2003.

The European Commission has also made a proposal for emissions trading that is intended to be implemented beginning in 2005. However, in this case, trading is limited to emissions from energy production, and large, fixed facilities where coal, oil or gas is burned. So far the transportation sector is not included.

A system based on open trading in emissions rights or quotas has long enjoyed vig-

Bookmarks in article

Links

- The World Bank
- PCF

SAS Airline

orous business and industry support. Large multinationals, above all in the energy and oil business – Shell and BP, for instance – have begun internal emissions trading.

International air traffic omitted from the Kyoto Protocol

International air traffic has been left out of the Kyoto Protocol. However the UN International Civil Aviation Organization (ICAO) has been tasked with attending to the role of aviation in reducing global emissions of greenhouse gases.

The ICAO has had a working group under its Committee on Aviation Environmental Protection (CAEP), which has discussed the question of various market-based solutions for reducing aviation's impact on climate.

The January 2001 report, Market Based Options, analyzes the effectiveness and consequences of a number of various market solutions. Among these are charges, taxes and voluntary agreements as well as two different systems for emissions trading – a closed one kept within the airline sector and an open one allowing free trade between countries and industries.

The analysis has studied three different alternative goals, of which the most ambitious was that aviation would fulfill the Kyoto Protocol's requirements to reduce carbon dioxide emissions. If this is to be achieved via taxes and charges, these must be high enough to raise the price of aviation fuel tenfold. This price jump would reduce airline operations and thus emissions, because flying would become too expensive.

Cutting operations is currently the only way that the airline industry can on its

Bookmarks in article

Links

- Shell
- BP
- ICAO
- CAEP

SAS Airline

own achieve relative reductions in carbon dioxide emissions corresponding to Kyoto Protocol targets. Today there is no known, commercially available technical solution for reaching these targets.

CAEP has done a preliminary study of the likely effects of sharply increased fuel prices on air travel. The result suggests that some air passengers would then opt for road or train travel, leading to an increase in total emissions. Although this applies chiefly to nitrogen oxides, carbon dioxide emissions would increase as well.

To achieve the environmental targets, that is, to reduce both carbon dioxide and nitrogen oxides emissions, currently requires a total reduction in transport activities. Moving transport from air to road yields no overall environmental gains, according to CAEP.

Therefore the committee advocates a system of totally open emissions trading. Such a scheme might be considerably more effective, since there are believed to be a considerable potential to cost-effectively reduce carbon dioxide emissions from sources other than aviation. In this case, for the foreseeable future the airline industry will be net purchasers of emissions rights.

Until its next assembly session in 2004, the ICAO continues to study how to incorporate aviation into a quota trading system. One of many thorny issues is finding a method of allocating international aviation's emissions to the national quotas.

Bookmarks in article

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The ozone layer

At high altitudes, that is, in the stratosphere, emissions of nitrogen oxides are suspected of damaging the ozone layer. Especially on northern routes, parts of international passenger traffic routes pass through the stratosphere. Otherwise it is mainly the relatively few Concordes, the Franco-British SSTs, that fly high enough to cause problems.

Nitrogen oxides cause damage in many ways

At lower altitudes and near emission sources, nitrogen oxides contribute both to acidification and eutrophication of the soil and bodies of water. In addition, together with strong sunlight, they form surface ozone. Unlike the essential ozone up in the stratosphere, surface ozone is hazardous to human health. In the upper part of the troposphere, nitrogen oxides are converted to ozone, which at such altitudes has a greenhouse effect.

Technology and technological developments

Aircraft have long lifetimes and tie up a great deal of capital – a normal-sized new long-haul aircraft costs approx MSEK 1,000. One should bear this in mind when speaking of “best available technology” (BAT), which, by the way, does not always mean “best commercially available technology” (EBAT), which SAS Airline always endeavors to select when investing in new equipment.

Bookmarks in article

SAS Airline

The new aircraft and engine solutions on the drawing board in 2002 will likely be in service until at least the middle of this century. Development times run between 5 and ten years, and the average lifetime of an aircraft is about 30 years.

The aircraft and aircraft engine industry is dominated by a very few players, among which are the European Airbus consortium and American Boeing. In the smaller aircraft market are Canadian Bombardier, Brazilian Embraer and German Fairchild Dornier. General Electric, Rolls Royce and Pratt & Whitney predominate among engine manufacturers. In addition there is the CFMI project, a collaboration owned by General Electric and French Snecma, as well as International Aero Engine (IAE), which is controlled by Rolls Royce and Pratt & Whitney.

SAS's environmental standards contribute to engine development

The airlines play a key role in the development and environmental improvement of aircraft and engines. In this, SAS Airline is one of the absolute leaders. It was SAS's requirements that were the impetus behind the development of the so-called DAC engine for the Boeing 737s ordered in 1995. It lowered emissions of nitrogen oxides by 40% compared with existing standard engines.

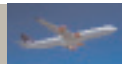
When in autumn 2000, SAS Airline negotiated for engines for its new Airbus A330s, an interesting alternative was launched that combined reduced fuel consumption with lower emissions of nitrogen oxides, goals difficult to achieve in conjunction. However, the manufacturer withdrew this proposal and offered a different engine. Still, SAS continued to show interest in the earlier engine solution. This

Bookmarks in article

Links

- Airbus
- Boeing
- Bombardier
- Embraer
- Fairchild Dornier
- General Electric
- Rolls Royce
- Pratt & Whitney
- CFMI

SAS Airline



encouraged the manufacturer to redesign its other engines, with the result that there are now several engines on the market with low-emissions technology. Later on, however, it turned out that SAS opted for another engine for the Airbus A330, a Rolls Royce Trent 772B. Although the selection was determined by overall economy, the engine chosen was also the quietest and had the lowest fuel consumption.

For the new Airbus A321s, which SAS started taking delivery of in autumn 2001, SAS chose an engine from IAE, the combuster of which, however, was developed by Pratt & Whitney. This engine has the lowest carbon dioxide emissions and is the market's quietest in its class. Encouraged by SAS, IAE then proceeded to study modifying this combuster and will likely be able to deliver a very promising solution.

Together with aircraft and engine manufacturers, SAS Airline is also engaged on a project aimed at finding solutions to the problem of noise in existing aircraft and engines. In any case, a solution is expected to be ready within two to three years.

Fuels

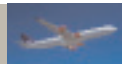
While even now there are cars on the market that run on fuel cells or on bio-based liquid fuels, aviation will continue to depend on fossil fuels for the foreseeable future. The reason is that no alternatives fuels exist that are suited to use in the current aircraft fleet. New fuels, including synthetic ones, do not work at all with the aircraft and engines that are currently on the drawing board.

Bookmarks in article

Links

- Rolls Royce
- Pratt & Whitney
- IAE
- FOI
- Airbus
- Shell
- Linde Gas

SAS Airline



Research and development in this area, however, have been going on for quite some time. For instance, within the framework of the EU research project CryoPlane, the possibility is being explored of producing hydrogen gas in a manner that makes this fuel a realistic alternative for aviation, also economically speaking. Sweden is participating in the project through the Swedish Defence Research Agency (FOI). Airbus, Shell and Linde Gas are also involved. The problem with hydrogen gas as jet fuel, besides the risk of explosion, is that the energy output from combustion is lower than that for jet fuel, meaning that aircraft will require fuel tanks approximately three times the size of today's tanks. Other groups of scientists are studying the possibility of producing synthetic aviation fuel from biomass, particularly waste. One of the more interesting projects in this regard is being carried out by the Gothenburg technology company Oroboros in collaboration with researchers at Chalmers University of Technology. The whole point of biofuels is that they are carbon dioxide-neutral, i.e. when combusted, they do not contribute to an increase in concentrations of atmospheric carbon dioxide, which fossil fuels do. Here they are also studying the possibility of extracting high-value fuel from industrial waste gases.

SAS supports and participates in the project, along with the Swedish Civil Aviation Authority, the Swedish Energy Agency and Volvo Aerospace. The objective is to develop a jet fuel, primarily from biomass, that is cleaner than today's jet fuel.

Bookmarks in article

Links

- Oroboros
- CTH, Chalmers University of Technology
- SCAA
- Swedish Energy Agency
- Volvo Aerospace

Benchmarking

The tables on the following page compare various airlines' fuel consumption and emissions to production.

ATK, RTK and RPK are various measures of production. ATK (Available Tonne Kilometers) means available capacity for passengers and cargo, RTK (Revenue Tonne Kilometers) is paid capacity for passengers and cargo and RPK stands for Revenue Passenger Kilometers. The various airlines' values may be based on differing calculation models, which affects comparability.

Despite the fact that SAS Airline has modernized its fleet in recent years, constantly investing in aircraft with the best ecoefficiency – with fuel efficiency thereby being the prime criterion for choosing aircraft and engines – SAS Airline has higher fuel consumption than its competitors.

This does not mean the SAS Airline is less ecoefficient than its competitors, but reflects the fact that SAS's route pattern differs from theirs. Compared with its rivals, SAS Airline has a very large percentage of short-haul flights, because SAS operates a large share of its airline business on the Scandinavian domestic market. Short flights result in greater fuel consumption per passenger kilometer, because takeoffs are the most fuel-intensive segments of flights.

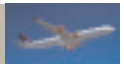
Many of SAS's competitors have a very small percentage of short-haul flights, aiming their primary activities at intercontinental traffic. Other competitors also include charter service in their operations, which also normally increases fuel efficiency, as charter aircraft almost always have more seats and nearly always operate full.

SAS Airline

Fuel consumption and emissions in relation to production

Comparison with other carriers (Source: carriers' most recent annual and environmental reports).

g	British Airways	Lufthansa	KLM	Alitalia	Finnair	**SAS Airline**
Fuel consumption	2001	2000/2001	2000/2001	2000	2000	**2000**
Per ATK	216	226	217	285	–	**297**
Per RTK	331	299	277	398	378	**459**
Per RPK	44	48	48	57	44	**57**
Carbon dioxide						
Per ATK	680	713	685	899	–	**935**
Per RTK	1,008	942	874	1,255	1,184	**1,447**
Per RPK	139	153	150	179	137	**179**
Nitrogen oxides						
Per ATK	3.2	3.4	2.7	4.0	–	**3.3**
Per RTK	5.0	4.5	3.5	5.6	5.0	**5.1**
Per RPK	0.7	0.7	0.6	0.8	0.6	**0.6**
Water vapor						
Per ATK	267	280	269	353	–	**367**
Per RTK	396	370	343	493	467	**569**
Per RPK	55	60	59	70	54	**70**
Hydrocarbons						
Per ATK	0.1	0.1	0.2	0.2	–	**0.4**
Per RTK	0.1	0,1	0.2	0.3	0.4	**0.5**
Per RPK	0.0	0.0	0.0	0.0	0.0	**0.1**
Average distance flown per passenger						
km/passenger	2,771	2,120	3,728	1,593	1,682	**980**



Environmental management report SAS Airline

Flight operations

Flight operations account for approx. 86% of the SAS Group's total environmental impact. SAS Airline accounts for the lion's share. On a global scale, aircraft emissions of carbon dioxide affect the climate and the stratospheric emissions of nitrogen oxides contribute to depletion of the ozone layer. At the local level, the environmental impact of aircraft is associated with noise during takeoff and landing. Furthermore, local emissions of nitrogen oxides cause acidification and eutrophication of soil and water.

In 2001, SAS Airline's total production, measured by ATK, rose by 5.1% to 5,006 (4,763) MATK. At the same time, utilized capacity increased by 1.2% to 3,125 (3,088) MRTK.

The cabin factor went down 2 percentage points to 65% or 71%, counting passengers who pay less than 25% of the fare. At the same time, it should be stressed that SAS Airline's cabin factor increased by 3 percentage points the year before, the highest the company has had since 1992.

Fuel consumption and emissions

Total fuel consumption rose by 0.4% to 1,651,625 (1,645,739) m^3. However, the increase was modest in view of the fact that operations increased by 5.1%. Fuel effi-

SAS Airline

ciency sank marginally compared with the year before, to 46.0 (45.9) kg/100 RTK.

In 2001 SAS Airline's total emissions of carbon dioxide and nitrogen oxides increased somewhat. Emissions of carbon dioxide increased to 4,110 (4,095) ktonnes and nitrogen oxides to 14.85 (14.35) ktonnes, but emissions of hydrocarbons went down to 1.50 (1.55) ktonnes. The increase in carbon dioxide emissions is entirely proportional with the increase in fuel consumption. The higher emissions of nitrogen oxides are explained by the fact that total production increased through the phasing in of new aircraft in 2001. For example, the switch from Fokker F50 to the larger deHavilland Q400 planes has increased SAS Commuter's share of nitrogen oxide emissions by as much as 20%. The phasing in of four Airbus A340 aircraft was also a factor in the increased emissions of nitrogen oxides.

The fleet

In 2001 SAS Airline's fleet was reduced by three aircraft, to 200. Twenty-seven new planes have been ordered and will be delivered over the next two years. The scheduled deliveries comprise three Airbus A340s, four Airbus A330s, nine Airbus A321s, six Boeing 737s and five deHavilland Q400s. Because of the crisis in the airline industry, SAS Airline has negotiated delivery postponements for 15 of the aircraft that were ordered. The postponements are for an average of six months.

In 2001 SAS Airline took delivery of 24 brand new aircraft: Four Airbus A340s, designed for long-haul flights, three Airbus A321s, to be used on heavily trafficked routes within Scandinavia and the rest of Europe, three Boeing 737s, designed for

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Read also

- Aircraft fleet, SAS Airline

SAS Airline

short- and medium-haul routes and 14 deHavilland Q400s. The latter will be used by SAS Commuter. All of these aircraft are more ecoefficient than the planes they replaced.

In 2001 SAS Airline leased two Embraer 145s from Skyways, which conducts flights with its own personnel for SAS Airline's account, a so-called wet lease. Fuel consumption and emissions from those aircraft are included in the reported data for SAS Airline.

Since the new Airbus planes were not delivered until late 2001 they have not had any major influence on SAS Airline's overall ecoefficiency this year. However, the results will be clear over the next couple of years when all the new aircraft now on order are put into service. This will reflect the fact that the new aircraft have both greater capacity and more fuel-efficient engines. For example, the A330 and A340 have 40% more seats than the Boeing 767-300 ERs they are replacing, as well as greater cargo capacity and more fuel-efficient engines. The relative carbon dioxide emissions from the A330 and A340 are estimated to be up to 20% lower than that from the Boeing 767, per passenger.

The fact that SAS has remained firm and stuck to its investment plans will give the company an edge when the airline market starts to recover, compared with competitors who opted to put their investment plans on hold. That applies especially to airlines with older Boeing 747s or DC 9s in their possession, because these aircraft will probably have a hard time complying with future noise standards at a number of key European airports.

Bookmarks in article

Links

- Skyways

SAS Airline

In 2001 SAS Airline continued working on the Configuration 2000 project, which will be completed in 2002. It involves revamping all MD-80 and MD-90 aircraft to seat up to 9% more passengers, which will mean a relative reduction in environmental impact.

Engines

In April 2001, after long negotiations with various potential engine suppliers, SAS decided on Rolls Royce Trent 772B engines for the long-haul aircraft A330. Overall economy was the decisive factor, but not only did this engine produce the least noise, it was also lighter than the alternatives, which means more fuel efficiency and lower carbon dioxide emissions. However, the second choice of engine, from another manufacturer, was more ecoefficient with regard to limiting the amount of nitrogen oxides emission.

As for engines for the Airbus A321, the delivery of which commenced in the autumn of 2001, SAS Airline has decided that these will be emblazoned with SAS Airline's environmental logo, i.e. the same label that is affixed to the DAC engines and which stands for best commercially available technology. The V2500 engines on the A321 are manufactured by IAE. They have the lowest fuel consumption for that type of aircraft and are the quietest engines in their class.

SAS has technical problems with the DAC engines. The problems were detected in 2000 and temporarily dealt with in 2001. The engine manufacturer has now come up with a permanent solution to the problem, namely a new design of the tur-

Bookmarks in article

Links

- Rolls Royce
- IAE

SAS Airline

bine blade. All DAC engines will be successively fitted with the new turbine blades in 2002 and 2003.

The problem with the DAC engines had a totally new and unexpected consequence in 2001. In order to protect the turbine blades – while waiting for their replacement – descents from high altitudes to landing were made as much as possible with the engines idling. When the engines are idling, temperature changes occur in the combustion chamber, generating noise measuring up to 6 dB more than what should be expected. This was discovered when these otherwise unusually quiet Boeing 737-600s suddenly started being reported in the aircraft noise monitoring system at Frankfurt Airport. At takeoff, the aircraft were always relatively very quiet. The noise problems arose on approach, approximately 6 kilometers from the landing strip, while the plane was at a relatively high altitude.

Frankfurt Airport has reported the variances, but has received no complaints so far. SAS has contacted both the aircraft and the engine manufacturer in order to find a solution to the problem.

Cabin operations

Because SAS Airline switched to another caterer in 2000, the previous environmental goals no longer apply. No specific environmental goals have been discussed with the new supplier, LSG Skychefs. However, LSG Skychefs has set its own goals, which involve optimizing energy utilization, among other things.

In 2001, 5.68 liters of water and 1.15 kWh energy were consumed per produced

Bookmarks in article

Links

- Frankfurt Airport
- LSG Skychefs

SAS Airline

meal. Each meal resulted in 0.31 kg of waste. Operations at the aircraft catering facility at Arlanda Airport are not included in the energy consumption calculations because of uncertainty about the collected data.

In 2001 aluminum cans were used aboard aircraft in Norway and Sweden, corresponding to 34.5 tonnes of aluminum. In Norway, 14.26 tonnes of aluminum cans are collected, corresponding to a collection rate of 76 (76%). In Sweden, only 1.16 tonnes of aluminum cans have been recorded as returned. Surveys show that they are collecting aluminum cans aboard the aircraft, exactly as before, but that the collected material is probably not being recorded. In Denmark there is a ban on using aluminum cans, which will be lifted in 2002.

LSG Skychefs has begun using new and refurbished airline catering facilities, resulting in considerably lower water and energy consumption, though waste volume have increased somewhat compared with previous inflight catering suppliers.

In 2001 SAS Airline and LSG Skychefs started work on securing data and establishing measurement numbers for these operations. This work will be completed in 2002.

In Copenhagen, LSG Skychefs encountered extraordinary problems. Because of the outbreak of foot and mouth disease, Danish authorities introduced new regulations. For example, waste from all incoming flights from Great Britain, Ireland, Holland and France had to be handled completely separately. SAS Airline then chose to use as much disposable material as possible. The alternative was to send the dishes to dishwashing at special units established for that purpose. Naturally, the environmental impact of these actions could not be studied in advance and has been impossible to fully establish so far.

Bookmarks in article

SAS Airline

In the spring of 2002 mold damage was discovered in LSG Skychefs' office building at Arlanda. After discovering the situation, SAS made two independent hygiene inspections without finding any discrepancies in the production department, which is located separate from the office department. LSG Skychefs conducted three mutually independent air-quality measurements without finding any trace of mold or other harmful substances. On the contrary the air quality was shown to be of extremely high quality in the production facility.

In SAS Airline's new organization, all cabin-related operations are managed by the business unit Inflight Services, where the environment is a priority area. In 2000, Inflight Services conducted a real-time analysis that will result in the spring of 2002 in a future vision, environmental goals and an environmental strategy. This will form the basis for operations for the next three years. This work includes developing environmental key environmental indicators for operational management. In the autumn of 2001 Inflight Services added to its staff an environmental engineer who will devote 50% of his time to environmental projects.

Environmental aspects shall always be included in grounds for decision-making, which also applies to developing new in-flight customer offerings and services. Consequently, they are studying the possibility of using, e.g., disposable plates and cups made of recycled paper on SAS Airline's short-distance flights.

Inflight Services has also developed a new wheel system that reduces the weight of the food trolleys in the new Airbus A340 and A330. Each trolley is thereby one

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SAS Airline

kilogram lighter. The total effect for all the relevant aircraft is of this one kilogram per trolley translates to approx. 116 tonnes less jet fuel per year. To reduce trolley weight even further, a new and somewhat lighter drawer system is being studied for food trolleys. Every kilogram by which a plane's total weight is reduced means approx. 40 grams less fuel consumption per hour.

In 2001 SAS Airline Inflight Services launched a study into how environmental cooperation with its 500 suppliers can be more purposeful and efficient. For this reason, the company has decided that environmental standards shall be concentrated on the factors that SAS Airline can actually influence. The environmental standards should also be such that it is possible to check whether they are being complied with.

To save resources, SAS Airline amended its rules in 2001 on "uplift," i.e. beer, spirits and beverages they were obliged to take onboard at foreign destinations. Beverages are normally loaded only at SAS's domestic airports. Previously, all uplift beverages have been destroyed, but henceforth it will be permissible to serve beverages in cans and bottles labeled in a non-Scandinavian language.

Ground operations

The total amount of waste in ground operations fell by 13% to 3,544 (4,064) tonnes (not counting hazardous waste). The amount of hazardous waste was reduced by 56% to 571 (1,306) tonnes. The reduction is chiefly explained by the fact that SAS Airline has a new purification plant for process water and like the year before hauled

Bookmarks in article

SAS Airline

away the process water as special waste, at a cost of MSEK 2. The investment cost for the new purification plant at Gardermoen was MSEK 8.

The ongoing energy efficiency program reduced energy consumption by SAS Airline's ground operations by 1.2%, to 341 (345) kWh/m^2. Water consumption in ground operations was 186,790 (194,359) m^3, which is a 4% reduction.

SAS Airline's properties at Arlanda have been additionally insulated in order to save energy. Gothenburg Airport conducted a discharge inventory with the aim of studying the need for water purification. It is not clear at this time whether the inventory will lead to future investment needs.

At the request of Copenhagen County, Scandinavian Technical Services (STS) has drawn up plans for a new purification plant for wastewater in conjunction with the hangar at Copenhagen airport. Scheduled for completion in mid-June 2002, the plant is the same type that SAS Commuter put into service at the airport in 2000 and will cost an estimated MSEK 8. The filtration plant is designed to separate out the heavy metals and handle oil and detergents.

Scandinavian Technical Services (STS) has invested MSEK 3.7 in a plant for cleaning aircraft wheels and brakes. In a totally automated plant water and pollutants are separated.

The plant uses considerably less water, energy and cleaners and also reduces the quantity of polluted water that previously had to be hauled away by truck. In contrast with earlier, the cleaning is now done with water-based cleaning agents in a closed system.

SAS Airline

In 2000 the property department at Copenhagen airport began installing control units to optimize the operation of gas and oil-fired boilers at two terminal buildings covering 36 000 m². An evaluation done in 2001 shows that the measures have yielded energy savings of 15% per year.

June 2001 saw the opening of an enclosed container area at Copenhagen airport. It has been proposed that waste for further sorting is to be transported here from all SAS units in the domestic area, station building and technical department. The waste is handled by a specially trained person, but each department is responsible for at least attempting to pre-sort its waste.

The purpose of the collection area is to raise the quality of the sorted waste by reducing it to pure fractions. This means that SAS can be reimbursed for them instead of as before being fined for delivering impure fractions, even though the waste in question primarily consists of paper, cardboard, plastic, fluorescent tubes, electronics, PVC plastic, metals and flammable waste in two fractions – small and large – as well as a fraction for constuction waste.

At Copenhagen airport, SAS Airline and the charter airline Premiair are working on a project involving the pre-sorting of waste from aircraft. Premiair, which pre-sorts its waste on board, delivers the waste to SAS Airline property department, which ensures that the sorting is done properly.

SAS Airline views the projects as a preliminary exercise to what may happen when the EU waste directive takes effect in 2003. The directive prohibits depositing organic and liquid waste in landfills. Because a large part of the waste SAS generates

Bookmarks in article

Links

- Premiair

SAS Airline

in Denmark and Sweden is incinerated, which is permitted, it is believed the directive will not have any major impact on operations in Scandinavia. On the other hand, it could affect SAS Airline at stations outside Scandinavia if more airports decide to adopt restrictions on unsorted waste.

Property sales

In 2001 SAS sold 11 airport buildings in Scandinavia to Nordisk Renting AB and GE Capital Real Estate, for a total sum of MSEK 3,000. At the same time a 20-year lease was signed with the new owners in a so-called “sale-lease back” transaction. After the 20 years SAS has the opportunity to extend the lease and also has the option of buying back the buildings. Altogether, the sale includes 11 hangars, workshops, warehouses, garages, freight terminals and offices at Arlanda (Stockholm), Landvetter (Gothenburg), Kastrup (Copenhagen), Gardermoen (Oslo) and Flesland (Bergen).

The deal is part of the SAS Group’s strategy of freeing tied up capital to help finance new aircraft. At the same time replacing older aircraft is the single biggest contribution to the improvement of the SAS Group’s ecoefficiency.

The transaction increased SAS’s liquidity so much that the company was able to relatively withstand the economic slowdown and recession marking the latter part of 2001. The cost of the lease will not be higher than what it would have been with continued ownership of the properties.

During the 20-year lease SAS is entirely responsible for operating and maintaining the buildings, which is precisely regulated in a number of agreements. The

Bookmarks in article

Links

- Nordisk Renting AB
- GE Capital RE

SAS Airline

agreements also govern how any environmental problems, old as well as thus far unknown and future problems, are to be handled. SAS has the main responsibility for these problems.

SAS embraces the polluter pays principle and has consequently not had any objections to the environmental agreement, especially since SAS has operated and will continue to operate the facilities.

In conjunction with the deal, SAS and the buyer thoroughly reviewed all documentation concerning the buildings. Each building was also inspected for, for example, the existence of asbestos or other potentially problematic building materials. No significant or potential environmental problem was discovered in conjunction with the inspection and review of the documentation.

Because all of the buildings have been in constant use, they have also been maintained and are consequently in very good condition. The buildings at both Gardermoen and Kastrup are, moreover, fairly new.

Permits, infringements, incidents and disputes

No infringements of environmentally related permits were reported in 2001. Nor were any significant environmentally related incidents, disputes and complaints filed, which we dare say is unusual for a company with SAS Airline's operations and size.

Environmental permits and mandatory reporting

Flight operations are not regulated by special environmental permits, but must com-

Bookmarks in article

SAS Airline

ply with the terms set by the various airport operators. Various national rules and may also apply.

It is the responsibility of the aircraft manufacturer to ensure that all aircraft meet the certification standards for specific maximum levels for noise and that the engines satisfy specific maximum levels for emissions. The permitted thresholds for noise and other emissions are established by the UN civil aviation organization ICAO. Before a new aircraft is put into service in a country it must be registered by the national civil aviation authority, a process that also includes environmental approval.

Cabin operations are not environmentally regulated, but SAS Airline works with suppliers who are subject to national or local permits and regulations, such as veterinary and public health ordinances relating to handling of food products and organic waste.

Ground operations at several of the airports where SAS Airline has its own operations are regulated by environmental permits. This applies, for example, to Arlanda, where SAS received a new environmental permit in 2001. Of SAS Airline's 256,000 m^2 of floor space at Arlanda, permit-regulated operations are conducted on 56,000 m^2. The permit covers SAS workshops and governs air emissions, chemical and waste handling and target and monthly mean values for wastewater from the purification plant. Until 2001 the permit was interim, but is now permanent. SAS Airline's business unit Scandinavian Technical Services (STS) submits an annual environ-

Bookmarks in article

Links

- ICAO

SAS Airline

mental report to the county administrative board of Stockholm County.

SAS Airline also has permit-regulated operations at Copenhagen airport. Of SAS's 210,000 m^2 of floor space at Copenhagen Airport, permit-regulated operations are conducted on 17,472 m^2. SAS Airline has, at the request of the City of Copenhagen, applied for an environmental permit for a further 36,530 m^2 and is awaiting the decision of the authorities. The permit covers the regulation of the environmental impact of water and air emissions from mostly workshops and hangars. In this connection, SAS has begun construction of a new wastewater purification plant in connection with SAS Airline's hangars.

None of the existing environmental permits are scheduled for renewal during the coming financial year and SAS did not receive any orders under the Swedish environmental act or from any regulatory authority in respective countries.

Beyond that mentioned above, SAS Airline has no operations requiring notification or permits under current Swedish environmental legislation.

Infringement

During the past year SAS Airline did not cause any reportable contaminating emissions or near accidents with major economic or environmental consequences.

Accidents and incidents

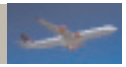
The major accident at Linate Airport outside Milan in October 2001 did not lead to any major environmental consequences. SAS Airline was otherwise not involved in any environmentally related incidents in 2001.

Bookmarks in article

Links

- Linate airport

SAS Airline



Disputes and complaints

SAS Airline was not involved in any environmentally related disputes or significant complaints in 2001.

Changes in environmental regulations

In March 2001, Amsterdam airport introduced a night ban on takeoffs and landings with hushkitted Chapter 3 aircraft, i.e. Chapter 2 planes that have been hushkitted and recertified as Chapter 3 aircraft. SAS Airline, which had been flying a DC-9 to Amsterdam, was forced to switch to another type of aircraft that complies with the noise requirements. A similar ban was introduced at Charles de Gaulle airport outside Paris.

In September 2001, the ICAO adopted a new certification standard for noise, Chapter 4, which will apply from April 2006.

The EU is preparing a new noise directive that is scheduled to take effect on April 1, 2002. It is based to a certain extent on the ICAO agreement from September 2001. In practice, the directive means that it should be possible to ban traffic with hushkitted Chapter 3 aircraft or restrict the operating hours of aircraft without a margin of at least 5 EPNdB below the Chapter 3 standard. The directive has no immediate significance for SAS Airline as the entire fleet now meets all existing noise limits.

There have otherwise not been any significant changes regarding current rules or restrictions in SAS's main markets in Denmark, Norway and Sweden.

Bookmarks in article

- Flight operations
- Cabin operations
- Ground operations
- Permits, infringements, incidents and disputes
- Changes in environmental regulations
- Profile and image

Read also

- The world around us, SAS Airline

Links

- Charles de Gaulle
- Schiphol

SAS Airline

Insurance, preparedness, preventive measures

Due to the nature of SAS Airline's operations, the possibility of environmentally detrimental accidents cannot be ruled out. SAS Airline's insurance covers the company's financial liability for environmental damage in the event of accidents and unexpected occurrences. SAS Airline has organizational resources and contingency and action plans in place to deal with crashes, accidents and incidents that can lead to contamination, in certain cases jointly with the airport operator.

In the aftermath of the terrorist attacks in the U.S.A. on September 11, 2001, the aviation insurance market underwent radical change. With seven days' notice the insurance industry canceled insurance policies covering third-party damage caused by acts of war or terrorism. To guarantee the correct amount of insurance coverage, which is also a requirement in the majority of leasing contracts, SAS Airline and other carriers were forced to request their respective governments to replace the missing insurance coverage with state guarantees. The Scandinavian states approved the request. The current guarantees run until March 31, 2002. SAS Airline cost for the state guarantees totals around MSEK 100 on an annual basis. Under normal circumstances the cost would be MSEK 2.

Other environmental matters

Following an appeal, Oslo Lufthavn A/S was issued a new environmental permit covering the threshold values for deicing liquids such as acetate, glycol and formiate. The previous criteria were formulated in such a way that the airport would have had

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Links

- Oslo Lufthavn AS

SAS Airline

problems keeping the runways at Gardermoen ice and skid-free during certain periods. The rules were changed in 2001 and mean that the airport must take steps to ensure that any remnants of deicing liquids are gone from the test wells by the following summer.

Environment and economy

In 2001 SAS Airline paid a total of MSEK 1,024 (912) in external environmentally related changes. The main explanation for the increase is Norway's environmentally motivated passenger charge, which the Norwegian Storting voted to eliminate effective April 1, 2002. SAS Airline's other environmentally related costs rose to MSEK 54 (53).

By phasing in several new Boeing 737 aircraft with DAC engines, SAS Airlines emission charges in Sweden fell by 31%.

More and more airports are introducing noise-related landing charges. Frankfurt and Heathrow both have a bonus system favoring aircraft with the lowest noise levels in their class. SAS MD-80 planes have done well so far but in 2001 they disappeared from Frankfurt's bonus list because new aircraft with even better performance records have been introduced in that class.

Gardermoen airport in Norway has introduced a 50% surcharge on the landing fee for flights landing between 11 p.m. and 6 a.m. This night charge is treated as an environmental charge in the environmental report. In 2001 SAS Airline paid MSEK 0.5 in night charges, compared with MSEK 1.0 the year before.

Bookmarks in article

Links

- Frankfurt Airport
- Heathrow

SAS Airline

Environmental management

SAS Airline's environmental program is part of its overall management. In 2001 SAS Airline began using the Balanced Scorecard (BSC) in operational management and the management team has an environmental performance indicator in its BSC.

Scandinavian Technical Services (STS) has continued work on designing an ISO 14001 compliant environmental management system that it plans to fully integrate into the existing quality management system. STS believes a decision on possible certification of all operations in Scandinavia will be made in early 2003.

A web-based environmental training program, which all employees are required to take, was launched in the spring of 2002. Scandinavian Technical Services (STS) employees will begin their training in the spring of 2002. To be Available on the SAS Group's intranet, the program is based on four elements: Awareness, knowledge, activity and a test. Employees must score a certain number of points to be registered as having completed the training program.

Dialogue with stakeholders

At the ICAO's general assembly in September 2001, SAS Airline had a dialogue with aviation authorities and other airlines for the purpose of forging alliances to achieve well-thought-out environmental decisions.

In 2001 SAS continued work on developing a method to determine the value of social trust, a Social Trust Index. In collaboration with a consultant, SAS has begun building up a database and attempted to interest several other major companies in the project.

Bookmarks in article

Read also

- Environment and economy, SAS Airline
- Organization and process, SAS Airline

Links

- ISO
- ICAO

SAS Airline

Work on the Stakeholder Analysis, which started in 2000, resulted in 2001 in the assignment of environmental issues to the new Group unit Government and External Relations (GER). One of the reasons was that the stakeholder analysis clearly showed that a majority of major stakeholders said that environmental issues were important to them. The analysis has also provided a basis that makes it possible to work in a more refined and direct manner with stakeholders, based on their expressed interest as well as what SAS believes is important to communicate to the various groups.

Together with the Norwegian Civil Aviation Administration and Oslo Lufthavn, SAS Airline participated in a discussion with the Norwegian Pollution Control Authority and the Norwegian Ministry of Environment about the problems caused by deicing chemicals. The discussion resulted in a new environmental permit for Gardermoen.

For some time SAS Airline has also carried on a dialogue about the consequences of the Norwegian passenger charges on flights. These will be dispensed with on April 1, 2002 thanks in part to SAS's efforts to influence public opinion.

Following an intensive campaign by Greenpeace in May 2001 SAS Airline signed a commitment not to carry whale meat. The background was that Greenpeace demanded and got a number of competing airlines to publicly promise that they would not carry whale meat. In the beginning SAS Airline did not believe there was any purpose in signing a commitment – the issue was simply not relevant for SAS Airline, since for financial reasons it did not intend to transport whale meat. SAS Airline eventually sided with the other carriers. The announcement caused a stir, generating considerable coverage in the Norwegian media. The whaling issue is highly

Bookmarks in article

Links

- Norwegian Civil Avition Administration
- Oslo Lufthavn AS
- SFT
- Green peace

SAS Airline

sensitive in Norway, where fishing, which includes whaling, is an important industry.

A survey was conducted in 2001 concerning the web version of the SAS Environmental Report 2000 on the Internet. Respondents said that it was easy to read and well structured and the outcome provided feedback for the design of the SAS Environmental Report 2001.

Profile and image

Both SAS Airline's overall environmental image and environmental index fell in 2001, according to polls regularly carried out by the Group. The environmental image declined, however, by a considerably smaller degree than SAS Airline's overall image.

Several SAS Airline employees have been active in promoting greater environmental awareness at the European air traffic management organization Eurocontrol Guild of Air Traffic Services (EGAT). The driving force for SAS Airline has been the fact that a lack of coordination and air traffic control capacity causes delays and higher fuel consumption, thus increasing costs and environmental effects.

In September 2001, SAS Airline, as one of the largest European airlines, participated in an exhibition in conjunction with the EU conference "Greening of Transports" in Brussels. SAS Airline primarily described its environmental index and the environmental cooperation it has with aircraft and engine manufacturers in connection with negotiations on new aircraft.

Bengt Olov Näs, Director of Aircraft and Engine Analysis at SAS Airline Fleet Development, has been nominated as one of five finalists for the Swedish Utmärkt

Bookmarks in article

Read also

- Enviroment and economy, SAS Airline

Links

- Eurocontrol

SAS Airline

Miljöledarskap (Outstanding Environmental Management) award. The prize is awarded at the end of March 2002 by the organization Näringslivets Miljöchefer and the financial newspaper Finans Vision.

In 2001 SAS Airline's environmental director was a highly sought-after lecturer in and outside of Scandinavia. Typical topics have been aircraft and environmental issues, environmentally adapted travel and transportation, the development of environmental key performance indicators and environmental reporting. In several cases his speeches have resulted in press coverage of SAS Airline's environmental program.

SAS Airline has given guest lectures at the Royal Institute of Technology in Stockholm, the University of Oslo, the business school Erhvervsskolen Hamlet in Helsingør, and the and University College of Kalmar. SAS Airline's environmental department has also assisted a large number of students in degree programs relating to aircraft and the environment, the introduction of an environmental management system or environmental reporting.

The SAS Environmental Report 2000 was named the best environmental report of the year in Norway and Denmark. In Sweden it not only received the highest points of all, but was judged "an environmental report of international caliber" in the accounting and consulting firm Deloitte & Touche's ranking of voluntary reports by Swedish companies.

Nominating committees in Denmark, Norway and Sweden have, independently of one another, nominated the SAS Environmental Report 2000 for the European Environmental Reporting Awards to be announced in April 2002.

Bookmarks in article

Links

- Näringslivets Miljöchefer
- Finans Vision
- Royal Institute of Technology
- University of Oslo
- University College of Kalmar
- Erhvervsskolen Hamlet

SAS Airline

SAS was the third most “improved company” in the insurance company Folksam’s and financial newspaper Finanstidningen’s environmental index. According to the index, SAS ranked number three in cutting its total emissions of carbon dioxide, after AssiDomän and Sydkraft.

Sponsor commitments

SAS Airline has chosen to support a number of environmental projects, including financial support of several environmental education projects for children and young people. These include the “Nature and Environment” folder and the annually published “Environmental Book,” a teaching aid funded by the business community and distributed free of charge to elementary schools in Sweden and Norway.

In cooperation with the Norwegian Association of Masters of Science in Business (NSF), SAS Airline has instituted a grant to stimulate greater environmental awareness among business economists. The grant, which was awarded the first time in 2000, is given to the instructor who best succeeds in integrating environmental aspects into the curriculum. As a result of the prize, the business school in Bodø (the recipient of the first grant) decided in 2001 to offer obligatory courses in ethics and environmental protection, to be held the first and last semesters. In 2001, the prize went to an assistant professor at the Norwegian School of Management BI, which has long been a driving force in the academic community for general integration of environmental issues into subjects and courses.

Bookmarks in article

Links

- ASSI Domän
- Sydkraft
- Folksam
- NSF
- Norwegian School of Management BI
- Bodø Business School

SAS Airline

Collaborations

In 2001, SAS Airline chaired the International Flight Catering Association (IFCA) environment committee. Environmental Committee. The committee has been very active under SAS Airline's leadership. Among other things, an environmental section was set up on IFCA's website. The section contains basic environmental information designed for catering suppliers and buyers, news affecting the sector, interviews, good examples of environmental practices and links to valuable information.

Under SAS Airline's leadership, IFCA decided to concentrate on waste issues in the near term. For example, in cooperation with the Association of European Airlines (AEA), IFCA will examine the laws and rules governing the handling of aircraft waste in Europe. Totally different rules are currently in force, ranging from Gardermoen's rule that airlines leave all unsorted waste there to Austria's requirement that airlines pre-sort their waste, with any number of variations in between.

SAS Airline was the International Air Transport Association (IATA)'s representative at ICAO's general meeting in September 2001.

In 2001 SAS Airline chaired Star Alliance's Environmental Advisory Group EAG. Its activities came, however, to a standstill after September 11.

For a couple of years now SAS Airline has tried to interest partners and competitors in its environmental index. Because this effort has entailed the development of common key performance indicators for the industry, the index should be able to function as a benchmarking tool. In 2001 these efforts resulted in serious discus-

Bookmarks in article

- Flight operations
- Cabin operations
- Ground operations
- Permits, infringements, incidents and disputes
- Changes in environmental regulations
- Profile and image

Links

- IFCA
- AEA
- IATA
- ICAO
- Star Alliance

SAS Airline

sions with a couple of European airlines.

In 2001 SAS Airline, as in previous years, held regular meetings with central authorities and environmental ministries and politicians in the three Scandinavian countries.

This year SAS Airline also took part in meetings with other companies as well as with environmental administration officers in Solna, the municipality in which SAS's main office is located.

In Norway, SAS Airline was represented on the Confederation of Norwegian Business and Industry (NHO) climate committee.

Health and safety

Health and safety operations are carried out within the framework of SAS Airline's business strategies and national regulations in the countries where SAS Airline operates. Activities are governed by special strategy and are integrated in the responsibilities of every line manager. For a more detailed account of SAS's health, environment and safety activities, see the financial annual report.

Internal audit

In 2001 SAS's internal auditors audited both the internal environmental reporting process and external auditing of the environmental report. They expressed satisfaction with the result of the audit and had only a couple of minor remarks, which have now been acted on.

Bookmarks in article

- Flight operations
- Cabin operations
- Ground operations
- Permits, infringements, incidents and disputes
- Changes in environmental regulations
- Profile and image

Read also

- Auditors' statement

Links

- NHO
- SAS Group Annual Report 2001

Organization and process SAS Airline

SAS Airline's core activity, airline services, is governed by stringent national and international regulations with regard to quality and safety. In order to meet these requirements, SAS Airline has a special organization for systematic quality control and follow-up.

SAS Airline's environmental work is an integral part of SAS's overall management. Every manager with budget responsibility is obligated to include an environmental impact assessment as part of its decision-making basis.

SAS Airline's goal is to develop the current environmental management system into a documentable system in compliance with the international ISO 14001 environmental standard, for major parts of its operations. As a rule, environmental and quality systems used by SAS Airlines are far more rigorous than the more general environmental and quality standards in ISO 9000 and ISO 14000. The decision to apply for ISO 14001 certification will therefore be made by the respective manager according to business strategy evaluations.

Basis for SAS Airline's environmental operations

Environmental goals and strategies are adopted yearly by SAS Airline's Management Team (AMT). Aside from business strategies, their decisions are based on significant environmental aspects of the airline. SAS Airline furthermore has an environmental vision, policy, overall goals, and communication goals and strategies that are in line with SAS's sustainability policy and corporate environmental policy.

Bookmarks in article

Links

- ISO

SAS Airline

Follow-up of environmental operations

SAS Airline's Environmental Index is reviewed twice yearly by Group Management (GM), partly to raise awareness about environmental management and ensure policy follow-up, and partly to show internally that environmental issues are high on the list of priorities.

In 2001 the AMT began preliminary work on using the Balanced Scorecard (BSC) as part of its business management process. Environment will be one of several performance indicators on the scorecard. The environmental performance indicator is based on the airline business portion of SAS Airline's Environmental Index. BSC will be reported to the AMT once a month starting in early 2002.

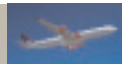
SAS Airline's overall environmental goals are translated by respective units into goals tailored to their respective operations. In addition, every year AMT draws up an environmental program covering the prioritized objectives for the next two years. When the new program is adopted the environmental director gives a report on what was done or achieved during the year. The units are responsible for reviewing their own environmental goal attainment.

Environment is part of the internal audits that are regularly carried out. Planning, implementation, reporting and follow-up are handled by SAS Airline's Health, Environment and Safety CHES departments.

Bookmarks in article

Read also

SAS Airline



SAS Airline's environmental organization

Environmental activities are led by AMT, whose efforts are supported by the central Group staff Government and External Relations (GER) and its environmental department. The latter also functions as SAS Airline's environmental staff.

SAS Airline has environmental coordinators in the larger departments that follow up environmental work on the basis of operational plans and environmental goals. They are also part of an environmental network. The HES departments also provide advice and follow-up in those cases where working environment and external environment issues coincide.

Information and training

Managers and key staff at SAS Airlines are given environmental training since environmental competency is one of the cornerstones of the company's basic training and skills development program.

SAS Airline has developed its own web-based environmental training program but has not yet put it into service. However, Scandinavian Technical Services plans to use the training in conjunction with its ISO 14001 work in 2002.

SAS's environmental report is an important source of information about environmental conditions and achievements for all employees. SAS Airline's in-house publications and intranet are also used to communicate environmental information.

Bookmarks in article

Read also

- Organization and process, SAS Group

SAS Airline

Subcontractors and other external contacts

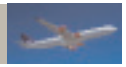
SAS Airline's purchasing manual stipulates that all suppliers must meet environmental requirements in both negotiations on new contracts and renewal of existing ones. In general, SAS Airline demands that its suppliers have an environmental policy and action program for environmental work. Moreover, suppliers should be able to document environmental data for the goods and services SAS Airlines buys, and that their subcontractors meet the same criteria.

The biggest environmental advances are achieved through the specifications SAS Airlines makes when ordering new aircraft. During the negotiation process, SAS Airline has discussions with several aircraft and engine manufacturers. It is company policy that new aircraft must always be environmentally superior to the aircraft they replace, and to always choose the best commercially available technology.

Other stakeholders

SAS Airline has an ongoing dialogue with a variety of stakeholders other than the company's own partners and subcontractors, such as influential environmental organizations in Europe. The purpose of these talks is to discuss the external demands placed on SAS as a good corporate citizen, and to inform these organizations about the regulatory framework for the airline industry. The goal is to find common ground in important issues affecting the creation of sustainable development.

SAS Airline



Collaboration and industry organizations

SAS Airline is part of Star Alliance, the world's largest network of airlines, whose members include SAS and 14 other major airlines. Star Alliance has an environmental committee in which SAS is an active participant. Star Alliance also has a joint Environmental Commitment Statement in which the airlines pledge to work for continuous environmental improvements and to promote development of green technology in procurements.

SAS Airline also participates in the environmental program of the three national industry organizations Flyselskapenes Landsforening in Norway, Föreningen Svenskt Flyg in Sweden and Dansk Industri in Denmark.

SAS Airline has a long-standing dialogue with the respective environmental and communications ministries and civil aviation authorities in the three Scandinavian countries. SAS also works closely with the airport operators, above all the three main airports in Copenhagen, Oslo and Stockholm.

In the international arena, SAS Airline is active in central agencies such as the International Civil Aviation Organization (ICAO), where SAS Airline represents the International Air Transport Association (IATA) in the environment committee CAEP. SAS Airline is also part of IATA's environmental Task Force (ENTAF) and plays an active role in environmental projects and committees in the Inflight Catering Association (IFCA) and the Association of European Airlines (AEA).

SAS Airline is also active in the Nordic working group for environmental issues in aviation (N-ALM), to increase awareness of the Scandinavian perspective in international bodies such as the ICAO.

Bookmarks in article

Links

- Star Alliance
- Flyselskapenes Landsforening
- Svenskt Flyg
- Dansk Industri
- ENTAF
- IATA
- IFCA

SAS Airline

Research and development

SAS Airline carries on a continuous and systematic dialogue with aircraft and engine manufacturers to promote the development of greener technology. SAS Airline is also engaged in basic research and studies on the airline industry's environmental impact through organizations through organizations such as the ICAO, IATA and AEA and has been actively involved in the EU-funded project AERO-CERT, which follows up how actual operating emissions correlate to the data used for certification. SAS Airline supports and is participating in a research project examining the possibility of producing aviation fuel from biomass. The project is being run by the Swedish company Oroboros in cooperation with scientists from Chalmers University of Technology.

SAS Airline maintains vital contact with Scandinavian universities and colleges and provides opportunities for academic thesis research. SAS Airline is also a contributor to the Environmental Science program at Linköping's University in Norrköping.

Environmental profiling and sponsorship

Strategic target groups for SAS Airlines environmental communication include customers, suppliers, employees, shareholders, other financial actors, the general public, mass media and the authorities. SAS Airlines therefore participates in seminars and debates and holds lectures at universities and colleges. The motive for these activities is the conviction that a well-developed environmental dimension in its brand maximizes its commercial potential and provides the company with new opportunities for business development.

Bookmarks in article

Links

- CAEP
- ICAO
- Oroboros
- Chalmers University
- Linköping's University
- AEA

SAS Airline

For two years now SAS Airline has been working actively with Save the Children in Denmark, Norway and Sweden. The aim of the B7 program, which is run by the Norwegian environmental foundation Bellona in cooperation with SAS and 24 other private and public organizations, is to see whether it is possible to reach a consensus on the long-term environmental requirements that can be made of business in order to promote the introduction of green technology and sustainable development.

In addition, SAS Airline has chosen to sponsor a number of different environmental projects. Together with Coca-Cola, SAS Airline manages a foundation to improve the aquatic environment in the Nordic region. SAS Airline is head sponsor of the Norwegian Sofie Award and the environmental award instituted by the crown princes of Denmark and Spain, the Royal Awards for Sustainability. SAS Airline is a long-standing partner in the independent international environmental organization Worldwatch Institute and has been a corporate partner of the World Wildlife Fund, WWF, for several years.

SAS Airline provides funding for environmental education projects for children, such as the “Nature and Environment” folder given to schoolchildren in Sweden. SAS Airline has funded the folder in the municipality of Sigtuna, where Arlanda airport is located. SAS Airline also supports the publication of the “The Environmental Book” – a teaching aid funded by the business community and distributed free of charge to elementary schools in Sweden and Norway. In Norway, SAS also sponsors Blekkulf’s environmental detectives, an environmental program aimed at children.

Bookmarks in article

Links

- Bellona
- Save the Children
- Coca-Cola
- Worldwatch
- WWF
- Blekkulf’s enviromental detectives

SAS Airline

SAS Airline's environmental program

Program 2001

	The aircraft fleet
✔	• SAS Airline continues to phase in new Airbus, Boeing and Bombardier aircraft to reduce relative environmental impact.
✔	• SAS Airline conducts a dialogue with engine and aircraft manufacturers on further development and environmental modification of new aircraft models.
	Framework and collaboration
✔	• SAS Airlines expands its work on the regulatory framework of the airline industry.
–	• SAS works with selected partners to improve environmental performance and facilitate environmental benchmarking in the airline industry.[1]
	Process and organization
–	• SAS Airline evaluates and, if necessary, applies for environmental certification for prioritized parts of its organization.[2]
–	• SAS Airline improves its environmental index by an average of three points per year.[3]
	Training
–	• 15% of SAS employees have received environmental training according to the criteria in ISO 14001.[4]
	Communication and image
✔	• SAS Airline expands its communication about resource consumption and environmental impact to various target groups via additional media and channels.
✔	• SAS Airline incorporates ethical and social aspects into the environmental report. Environmental information is effectively integrated into the annual report. Distribution via the Internet is also expanded.
✔	• Expands planned and systematic market communication about the environmental aspects of operations.
–	• Improvement of SAS Airline's environmental image in SAS TOTQ.[5]
✔	• SAS Airline is perceived by the general public as a leading airline in the environmental area.

Comments

[1] *Hit by the crisis in the airline industry, Star Alliance's environmental program has been put on hold.*

[2] *STS has been delayed in its efforts to introduce ISO 14000. The process will continue in 2002.*

[3] *The index improved by two points from 2000 to 2001, an average improvement of four points per year since 1996.*

[4] *The web-based environmental training program was completed in autumn 2001. Due to the crisis and subsequent cost cutting at SAS, implementation will start in 2002.*

[5] *SAS Airline's environmental image, part of SAS Airline's overall image, declined by one point in 2001.*

SAS Airline

Program 2002

The aircraft fleet

- SAS Airline continues environmental modification of the aircraft fleet by phasing in new Airbus models A340/330/321s and phasing out F-28s and hushkitted DC-9s.
- SAS Airline intensifies its dialogue with engine and aircraft manufacturers to achieve further environmental improvements.

Framework and collaboration

- SAS Airline prioritizes work on the regulatory framework for the airline industry, including the environment.
- SAS Airline continues to work with selected partners to facilitate environmental benchmarking in the SAS Group too.

Process and organization

- SAS Airline continues work on introducing an environmental management system based on ISO 14001, with a focus on continuous improvement.
- SAS Airline improves its environmental index from 2001 to 2002. The goal is three points on average from 1996 to 2004.
- SAS Airline expands its environmental network.
- SAS Airline incorporates environmental issues into business management through Balanced Scorecard (BSC).

Training

- STS commences web-based environmental training that meets the environmental training standards in ISO 14001.
- SAS Airline integrates environmental issues into training of managers and key staff.

Communication and image

- SAS Airlines systematizes its environmental communication aimed at various target groups and increases availability of information via additional media and channels.
- SAS Airline incorporates sustainability issnes into the environmental report.
- SAS Airline improves its environmental image in SAS TOTQ from 2001 to 2002.

SAS Airline

Program 2003

The aircraft fleet

- SAS Airline continues phasing in of A340/330/321s.
- The phasing in of Boeing 737s is completed.
- SAS Airline continues its dialogue with engine and aircraft manufacturers to achieve further environmental improvements, including modification of the combuster of the A321 engine.

Framework and collaboration

- SAS Airline prioritizes continued work on a competition-neutral regulatory framework for the airline industry in the environmental area.
- SAS Airline continues to work with selected partners to facilitate environmental benchmarking.

Process and organization

- STS shall have completed evaluation of environmental certification according to ISO 14001.
- SAS Airline improves its environmental index from 2002 to 2003. The goal is three points on average from 1996 to 2004.
- SAS Airline expands its environmental network.
- SAS Airline develops environmental key performance indicators in Balanced Scorecard.

Training

- Web-based environmental training continues at SAS.
- SAS Airline continues environmental training of managers and key staff.

Communication and image

- SAS Airlines expands its environmental communication and increases availability of information via targeted media and channels.
- SAS Airline continues work on sustainability reporting incorporating ethical and social aspects.
- SAS Airline's environmental image in SAS TOTQ shall provide a positive contribution to SAS Airline's overall image.

SAS Airline

SAS's environmental vision, policy, goals and strategies

Eco-political vision

SAS's eco-political vision is for all four transport sectors (road, rail, sea and air) to pay for both investments in, and use of, their infrastructures, other costs to society (e.g. accidents) and environmental damage according to the "polluter pays principle", after which they should compete in a uniform and competitively neutral transport system.

Policy

- SAS will develop profitably in free competition, with optimal utilization of resources and minimum environmental impact, in order to contribute to environmentally sustainable development of society.

Overall goals

- Within the framework of SAS's financial and qualitative goals, all operations shall be conducted so as to cause the least possible environmental impact.
- SAS shall have one of the airline industry's most ambitious environmental programs.
- SAS shall have environmental standards equivalent to the foremost competitors in the industry.
- SAS's environmental goals and measures shall be coordinated and harmonized with other production, qualitative and financial goals.

Bookmarks in article

SAS Airline

Communication goals

- SAS shall provide an account of its environmental performance in a separate environmental report.
- SAS shall promote an understanding of the role and environmental impact of civil aviation among external stakeholders.

Strategy

- Environmental activities shall be conducted at all levels and within all units, thus increasing environmental awareness throughout the organization.
- Environmental aspects shall be included in the grounds for all decisions in the line organization.
- SAS shall utilize/implement the methods that result in the lowest possible environmental impact.

SAS's eco-political vision, policy, goals and strategy were originally laid down by SAS management in 1995, and have thereafter been revised according to plan. SAS's Board of Directors has recently discussed the environmental policy and strategy at a meeting in early March 2001.

Bookmarks in article

SAS Airline

Resource use and environmental impact

The following pages provide a picture of SAS Airline's environmental impact and how it arises.

Flight operations

IN	SAS Airline's transport	Operation/ use
Aviation fuel Supplier: – Oil company	– [1]	Flight – Combustion in engine
–	–	– Fuel jettisoning
Motor oil, etc. Supplier: – Oil company	From storage to hangar/ramp	Flight – Combustion in engine – Oil drainage (oil fog)
	–	–Takeoff and landing

OUT	Activity	Final treatment/ environmental aspect	Significant environmental impact
Carbon dioxide	–	Emissions into air	Greenhouse effect
Water vapor			Greenhouse effect
Hydrocarbons			Greenhouse effect, ground level ozone
Nitrogen oxides			Greenhouse effect, acidification, ground level ozone, depletion of the ozone layer, eutrophication
			Consumption of non-renewable resources
Fuel vapor **– Carbon dioxide** **– Hydrocarbons**	–	Emissions into air (a small portion can reach the ground)	Greenhouse effect ground level ozone
Carbon dioxide	–	Emissions into air	Greenhouse effect
Oil aerosols	–	Emissions into air	Greenhouse effect
Noise	–	–	Disturbance

[1] *No transports under SAS Airline's management.*

SAS Airline

Cabin operations

IN	SAS Airline's transport	Operation/ use	OUT	Activity	Final treatment/ Environmental aspect	Significant environmental impact
Food, (incl. packaging) Supplier: – Catering companies	–[1]	Consumption	**Organic waste/ (leftover food)** **Packaging:** – Paper – Plastic – Aluminum	Presorting (partly) Transport	Incineration/ energy extraction Landfill	Greenhouse effect, acidification, ground level ozone, use of land, eutrophication
Beverages (incl. packaging) Supplier: – Dairies – Breweries – Wine & spirits importers	–[1]	Consumption	**Packaging, unopened beverages** – Glass – Plastic – Cardboard – Aluminum	Presorting (partly) Transport	Incineration/ energy extraction Landfill Reuse Recycling	Greenhouse effect, acidification, ground level ozone, use of land, eutrophication
Disposables Misc. suppliers	–[1]	Cabin service	**Waste** – Plastic – Paper – Cotton – Aluminum	Presorting Transport	Incineration/ energy extraction Landfill	Greenhouse effect, acidification, ground level ozone, use of land, eutrophication

[1] *No transports under SAS Airline's management.*

SAS Airline

Cabin operations

IN	SAS Airline's transport	Operation/ use
Non-disposable articles Suppliers: – Plastic and textile producers. – Tableware manufactures – Packaging suppliers	–[1]	Cabin service
Goods for sale Misc. suppliers	From storage to aircraft	Sales to customer
Magazines/ newspapers Suppliers: – Publishers/ distributors	From transit warehouse to aircraft/ lounges	Cabin service
Chlorinated water Suppliers: – Municipal water works – Chlorine suppliers	From storage to aircraft	Consumption – In lavatories – In galleys
Germicides[3] From suppliers	From filling site to aircraft	Added as sanitizing liquid in lavatories

OUT	Activity	Final treatment/ Environmental aspect	Significant environmental impact
Used semi-disposable articles – Porcelain – Melamine plastic – Glass – Stainless steel – Cotton	Washing/ laundering	Reuse	Water consumption, energy consumption, contamination of water and land, eutrophication
Sold articles	–[2]	–[2]	–[2]
Unsold articles	Transport to warehouse Repackaging	Return to sales	
Paper waste	Sorting	Reuse Recycling Incineration/ energy extraction Landfill	Greenhouse effect, acidification, ground level ozone, use of land
Waste water	Drainage Transport	Municipal waste water treatment	–
Lavatory waste	Drainage Transport	Municipal waste water treatment	–

[1] No transports under SAS Airline's management. [2] Depending on customer's handling [3] Antibacterial and antiviral compund.

SAS Airline

Ground operations

IN	SAS Airline's transport	Operation/ use
Glycol From supplier	From storage to aircraft	Deicing of aircraft
Urea/acetate From supplier	–[1]	Deicing of runways
Water From supplier: – Municipal waste water treatment plant	–[1]	Washing of aircraft/vehicles Extinguishing of fires Transport of organic waste
Halons From own storage	Between stations and from storage to aircraft	Extinguishing of fires on board

OUT	Activity	Final treatment/ environmental aspect	Significant environmental impact
Spillage	Collection Transport Leakage	Reuse Emissions into soil and water	Eutrophication
Spillage	Collection (limited) Transport	Emissions into soil and water	Eutrophication
Waste water	Drainage into municipal sewers	Municipal waste water treatment	Contamination of water
	Drainage into own drains with separator	Drainage of own separators (to hazardous waste)	Contamination of water
Halons (consumption)	–	Emission into air	Depletion of the ozone layer, greenhouse effect

[1] *No transports under SAS Airline's management.*

SAS Airline

Ground operations

IN	SAS Airline's transport	Operation/ use
Freon[2] From supplier	–[1]	Air conditioning Cooling of machinery
Maintenance materials • **Components, etc.** • **Chemicals** Misc. suppliers	From storage to appropriate site	Maintenance of aircraft, of use vehicles, equipment, buildings and land
Energy • **Oil** • **Gasoline, diesel** • **Biofuels** • **Gas** • **Electricity**	–[1]	Fuel Heating Cooling Electricity
Office supplies Misc. suppliers	–[1]	Administration

OUT	Activity	Final treatment/ environmental aspect	Significant environmental impact
Freon (leakage)	–	Emission into air	Depletion of the ozone layer, greenhouse effect
Hazardous waste machinery,	Presorting (predominant) Transport	Recycling Reuse Destruction Incineration Landfill Treatment Emissions	Greenhouse effect, acidification overfertilization, contamination of soil and water, noise
Sulfur dioxide **Carbon dioxide** **Hydrocarbons** **Nitrogen oxides** **Soot/particulates**	–	Emissions into air	Greenhouse effect, ground level ozone, acidification, eutrophication
Waste	Transport	Recycling Incineration Destruction Landfill	Greenhouse effect, contamination of soil and water

[1] *No transports under SAS Airline's management.*

Emissions and resource consumption

The following page shows progress in key environmental factors over three years. Results are adjusted relative to production growth. The green bars describe relative improvements and the red ones relative changes for the worse. Where data are not available for 2000, the improvement from 1999 to 2001 is indicated by a light green bar and changes for the worse in the same period with an orange bar.

The presentation is divided into Flight, Cabin and Ground, where flight operations account for 90% of SAS Airline's environmental impact. Cabin operations and ground operations account for 5% each, and so environmental improvement measures have the greatest impact in flight operations. Investing in new, more eco-friendly aircraft, which consume less fuel and also emit less carbon dioxide and generate less noise, is therefore SAS Airline's most important environmental measure.

SAS Airline

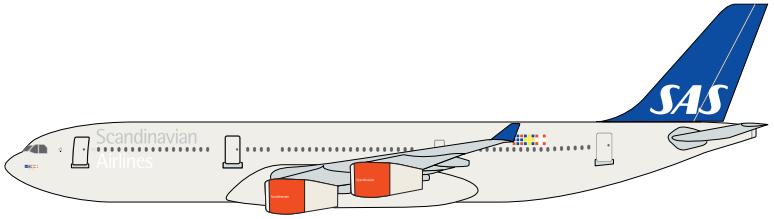
Environmental aspect	Change after adjustment for production growth[1]	1999	2000	2001	unit
Flight					
Fuel consumption	0.8	1,673	1,646	**1,652**	[1,000 m³]
Carbon dioxide	0.8	4,164	4,095	**4,110**	[1,000 ton]
Nitrogen oxides	2.3	14.5	14.3	**14.8**	[1,000 ton]
Hydrocarbons	3.9	1.8	1.5	**1.5**	[1,000 ton]
Water vapor	0.8	1,636	1,610	**1,615**	[1,000 ton]
Noise impact	13.7	4.06	3.41	**2.98**	[km²/85dB(A)]
Cabin					
Discarded aluminum cans	7.5	35.1	–[3]	**34.5**	[ton]
Collected aluminum cans	21.6	20.0	–[3]	**15.4**	[ton]
Unsorted waste	47.3	8,758	–[3]	**4,906**	[ton]
Collected newspapers	44.5	1,512	–[3]	**892**	[ton]
Ground					
Glycol consumption	40.8	4,952	4,597	**2,752**	[m³]
Diesel for ground vehicles	14.5	3,954	3,652	**4,231**	[m³]
Gasoline for ground vehicles	22.3	2,792	2,426	**1,915**	[m³]
Unsorted waste	16.1	2,347	3,055	**2,595**	[ton]
Hazardous waste	56.8	983	1,306	**571**	[ton]
Heavy metals (cadmium, chromium)	76.6	5	–[3]	**1.2**	[kg]
Water consumption in buildings	5.0	215	194	**187**	[1,000 m³]
Energy consumption in buildings	2.2	220	195	**193**	[GWh]
Relative energy consumption in buildings	2.4	349	345	**341**	[kWh/m²]
Production in revenue tonne kilometers (RTK)	1.2	2,938	3,088	**3 125**	[×10⁶]

Negative, % 0 Positive, %

[1] See also "Reporting principles". [2] Underlying data has been adjusted. [3] Data unavailable.

Change from 1999 och 2001
Change from 2000 och 2001
Change from 1999 och 2001
Change from 2000 och 2001

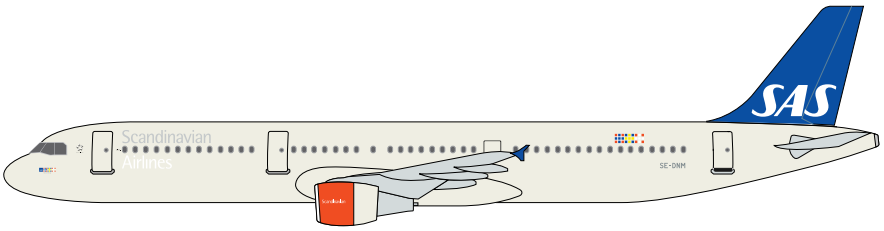
SAS Airlines' aircraft fleet



Airbus A340-300	Intercontinental
Number of aircraft	4
Max. takeoff weight [tonnes]	275
Number of seats	262
Engine type and number	4 CFM56-5C4
Max. drag [kN]	151.25
Range [km]	12,800
Fuel consumption, [l/ASK]	0.036
Engine emissions data according to ICAO certification requirements	
Nitrogen oxides NOx [g/kN]	57.5
Hydrocarbons HC [g/kN]	6.40
Carbon monoxide CO [g/kN]	41.6
Noise contour [km²/85 dB(A)]	4.9

Bookmarks in article

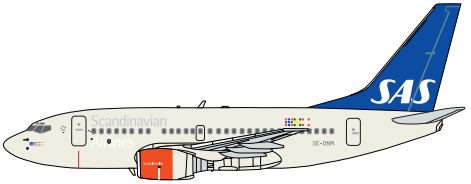
SAS Airline



Airbus A321-200	Europe
Number of aircraft	3
Max. takeoff weight [tonnes]	85
Number of seats	184
Engine type and number	2 IAE V2530
Max. drag [kN]	133.4
Range [km]	3,000
Fuel consumption, [I/ASK]	0.031
Engine emissions data according to ICAO certification requirements	
Nitrogen oxides NOx [g/kN]	58.0
Hydrocarbons HC [g/kN]	0.26
Carbon monoxide CO [g/kN]	19.7
Noise contour [km²/85 dB(A)]	2.3

Bookmarks in article

SAS Airline



Boeing 737-700	Domestic
Number of aircraft	6
Max. takeoff weight [tonnes]	61.7
Number of seats	131
Engine type and number	2 CFM56-7B20/2
Max. drag [kN]	91.6
Range [km]	2,200
Fuel consumption, [l/ASK]	0.045
Engine emissions data according to ICAO certification requirements	
Nitrogen oxides NOx [g/kN]	30.6
Hydrocarbons HC [g/kN]	14.6
Carbon monoxide CO [g/kN]	108.6
Noise contour [km²/85 dB(A)]	1.5

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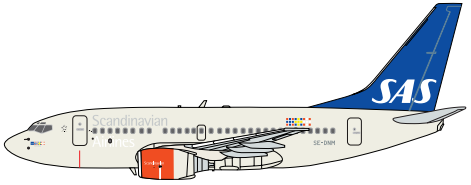
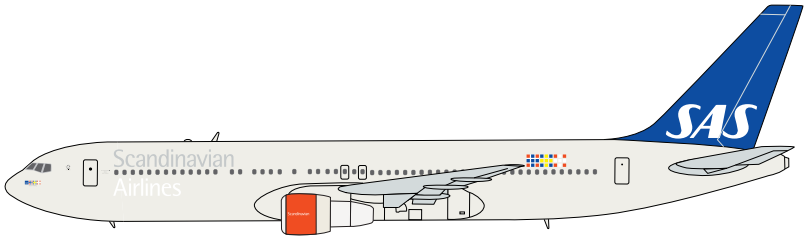
SAS Airline



Boeing 737-600/800	Domestic/Europe
Number of aircraft	Domestic 10/13 Europe 20/4
Max. takeoff weight [tonnes]	57.6/70.5
Number of seats	98/179
Engine type and number	2 CFM56-7B20/2/-7B26/2
Max. drag [kN]	91.6/117
Range [km]	1,900–2,400/3,700
Fuel consumption. [l/ASK]	0.048/0.034
Engine emissions data according to ICAO certification requirements	
Nitrogen oxides NOx [g/kN]	30.6/36.2
Hydrocarbons HC [g/kN]	14.6/12.2
Carbon monoxide CO [g/kN]	108.6/81.4
Noise contour [km²/85 dB(A)]	1.2/2

Bookmarks in article

SAS Airline



Boeing 767-300 ER	Intercontinental
Number of aircraft	12
Max. takeoff weight [tonnes]	186.9
Number of seats	204
Engine type and number	2 P&W 4060
Max. drag [kN]	267
Range [km]	10,500
Fuel consumption [l/ASK]	0.038
Engine emissions data according to ICAO certification requirements	
Nitrogen oxides NOx [g/kN]	52.7
Hydrocarbons HC [g/kN]	2.2
Carbon monoxide CO [g/kN]	27.1
Noise contour [km²/85 dB(A)]	3.9

Bookmarks in article

SAS Airline

Douglas DC-9-41	Europe /Domestic
Number of aircraft	12
Max. takeoff weight [tonnes]	51.7
Number of seats	105
Engine type and number	2 P&W JT8D-11HK
Max. drag [kN]	67
Range [km]	2 600
Fuel consumption, [l/ASK]	0.054
Engine emissions data according to ICAO certification requirements	
Nitrogen oxides NOx [g/kN]	56.1
Hydrocarbons HC [g/kN]	36.8
Carbon monoxide CO [g/kN]	134.7
Noise contour [km²/85 dB(A)]	–

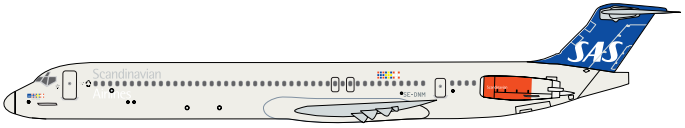
Bookmarks in article

SAS Airline

Douglas MD-81/82/87	Europe
Number of aircraft	16/31/16
Max. takeoff weight [tonnes]	63.5/67.8/61.2
Number of seats	145/141/110–125
Engine type and number	2 P&W JT8D-217C
Max. drag [kN]	89
Range [km]	2,600/3,200/3,500
Fuel consumption, [l/ASK]	0.046/0.046/0.047
Engine emissions data according to ICAO certification requirements	
Nitrogen oxides NOx [g/kN]	64.6
Hydrocarbons HC [g/kN]	10.1
Carbon monoxide CO [g/kN]	45.8
Noise contour [km²/85 dB(A)]	4.7/4.7/4.1

Bookmarks in article

SAS Airline



Douglas MD-83	Europe /Domestic
Number of aircraft	2
Max. takeoff weight [tonnes]	72.6
Number of seats	141
Engine type and number	2 P&W 3T8D-219
Max. drag [kN]	93
Range [km]	4 300
Fuel consumption, [l/ASK]	0.045
Engine emissions data according to ICAO certification requirements	
Nitrogen oxides NOx [g/kN]	63.3
Hydrocarbons HC [g/kN]	9.9
Carbon monoxide CO [g/kN]	33.5
Noise contour [km²/85 dB(A)]	7.9

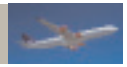
Bookmarks in article

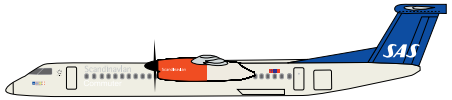
SAS Airline

Douglas MD-90-30	Europe /Domestic
Number of aircraft	8
Max. takeoff weight [tonnes]	70.8
Number of seats	141
Engine type and number	2 IAE V2525-D5
Max. drag [kN]	111
Range [km]	2,800
Fuel consumption, [l/ASK]	0.039
to ICAO certification requirements	
ICAO:s certifieringskrav	
Nitrogen oxides NOx [g/kN]	48.5
Hydrocarbons HC [g/kN]	0.3
Carbon monoxide CO [g/kN]	24.9
Noise contour [km²/85 dB(A)]	1.7

Bookmarks in article

SAS Airline

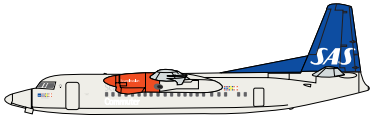




deHavilland DASH 8-Q400	Europe /Domestic
Number of aircraft	23
Max. takeoff weight [tonnes]	29
Number of seats	72
Engine type and number	2 P&W 150A
Max. drag [kN]	3 071
Range [km]	1 000
Fuel consumption, [l/ASK]	0.045
Engine emissions data according to ICAO certification requirements	
Nitrogen oxides NOx [g/kN]	Certifieras ej
Hydrocarbons HC [g/kN]	Certifieras ej
Carbon monoxide CO [g/kN]	Certifieras ej
Noise contour [km²/85 dB(A)]	0.5

Bookmarks in article

SAS Airline



Fokker F50	Europe /Domestic
Number of aircraft	9
Max. takeoff weight [tonnes]	20.8
Number of seats	46
Engine type and number	2 P&W 125B
Max. shaft horse power [shp]	2 500
Range [km]	1 400
Fuel consumption, [l/ASK]	0.038
Engine emissions data according to ICAO certification requirements	
Nitrogen oxides NOx [g/kN]	Not certified
Hydrocarbons HC [g/kN]	Not certified
Carbon monoxide CO [g/kN]	Not certified
Noise contour [km²/85 dB(A)]	0.8

Two aircraft leased out to airBaltic

11 (13)

Bookmarks in article

SAS Airline

Embraer 145

Number of aircraft	3
Max. takeoff weight [tonnes]	22
Number of seats	48
Engine type and number	2 AE3007A
Max. drag [kN]	33.7
Range [km]	2,852
Fuel consumption, [l/ASK]	0.044
Engine emissions data according to ICAO certification requirements	
Nitrogen oxides NOx [g/kN]	46.3
Hydrocarbons HC [g/kN]	6.65
Carbon monoxide CO [g/kN]	43.15
Noise contour [km²/85 dB(A)]	–

Bookmarks in article

Other aircraft

SAS Airline's overall fleet includes an additional 8 F28s that are not in service.

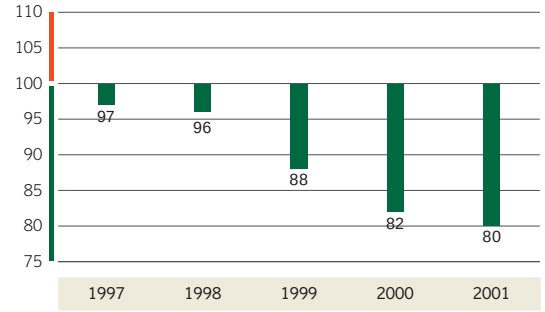
SAS Airline

Environmental index

SAS Airline measures progress in its ecoefficiency with the aid of an environmental index, which is based on three component indexes, flight, cabin and ground operations. In 2001 the overall index improved by two points. The target is to achieve an improvement of on average three points per year over the period from 1996 to 2004. See “Reporting principles” for information on details regarding calculation methods and parameters.

Environmental index, overall, SAS Airline

1996=100



SAS Airline’s environmental index has 1996 as its base year. In its essentials the overall index follows the trend in the environmental index for flight operations, as this has the heaviest weighting, 90%. The improvements in 2001 are primarily explained by increased efficiencies in water and energy consumption, since the inflight caterer has brought new or refurbished catering facilities on line. In ground operations, reduced glycol consumption, among other things, helped to improve the index. Flight operations show a marginal improvement. A new basis for calculating SAS Airline’s environmental index was introduced starting in 2000. Previous years’ indexes have been recalculated for the sake of comparability.

Bookmarks in article

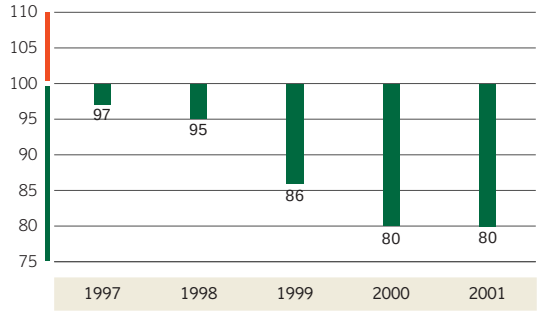
Read also

- Reporting principles

SAS Airline

Environmental index, flight operations, SAS Airline

1996=100



See “Reporting principles” for information on details regarding calculation method and parameters. Improvements made up until 1999 are the result of streamlining operations. Subsequently they can be explained by the gradual phasing-in of new, more environmentally friendly aircraft, though also by increased efficiency. From 2000 to 2001 there has only been a marginal improvement.

Bookmarks in article

- Environmental index, overall
- Environmental index, flight operations
- Environmental index, cabin operations
- Environmental index, ground operations

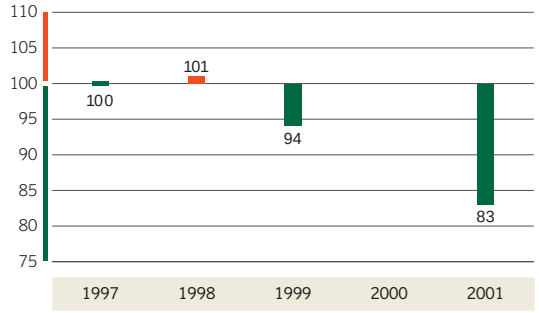
Read also

- Reporting principles

SAS Airline

Environmental index, cabin operations, SAS Airline

1996=100



See “Reporting principles” for information on details regarding calculation method and parameters. During 2000 SAS Airline changed its inflight caterer. This has made the data basis for cabin operations so uncertain that no calculation of a cabin index was done for 2000, and the cabin index from 1999 was used to calculate the overall index for 2000. The improvements from 1999 to 2001 are chiefly due to a sharp reduction of energy and water consumption, which in turn is due to new production facilities and the application of a different concept compared with the previous caterer.

Bookmarks in article

- Environmental index, overall
- Environmental index, flight operations
- Environmental index, cabin operations
- Environmental index, ground operations

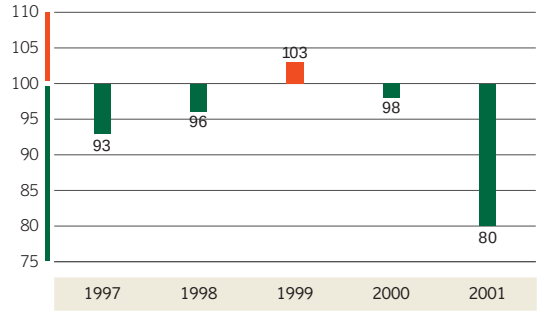
Read also

- Reporting principles

SAS Airline

Environmental index, ground operations, SAS Airline

1996=100



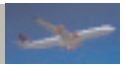
See “Reporting principles” for information on details regarding calculation method and parameters. The sharp improvement from 2000 to 2001 can be explained by reductions in the use of glycol, in fuel for vehicles and in hazardous waste.

Bookmarks in article

- Environmental index, overall
- Environmental index, flight operations
- Environmental index, cabin operations
- Environmental index, ground operations

Read also

- Reporting principles



Environment and economy

SAS's environmental work has two overall objectives: Besides ensuring that the group's operations are in compliance with environmental laws and regulations, such activities should contribute to an efficient utilization of resources. Environmental activities should also enhance the value of the SAS brand.

The operations of SAS Airline are characterized by a close relationship between environmental impact and economy. There is a particularly strong relationship between owning older aircraft, phasing in new aircraft and fuel consumption, as well as the emissions that are related to fuel consumption. Fuel costs represented 10% of the Group's total costs in 2001. The combustion of fuel in aircraft engines accounted at the same time for 86% of the Group's total environmental impact, mainly from emissions of carbon dioxide and nitrogen oxides, as well as noise.

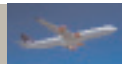
The energy consumed by the ground operations and hotel operations is another important environmental and cost aspect for the Group. The economic importance of the Group's other environmental aspects, such as exceeding permits, disputes and liabilities related to contaminated properties, was insignificant in 2001, as has also been the case in earlier years.

New classification of environmental costs

Starting this year, SAS will be using new and more stringent definitions for the external environmental costs that are paid by the Group. The external environmentally related costs consists of environmental charges, and environmentally related

Bookmarks in article

SAS Airline



charges and taxes. The new concepts and definitions are stated in the section "Reporting principles". The environmental costs that are reported in this year's environmental report are based on the new definitions, and apply only to SAS Airline. The costs incurred in earlier years have also been restated based on the new definitions.

Airline industry pays for its infrastructure

A distinctive characteristic of the aviation industry is the fact that it pays for the infrastructure it uses, i.e. the airports and air traffic control systems. These costs are paid through a number of different charges, which include a number of different environmental charges and environmentally related charges. In 2001 SAS Airline paid approximately SEK 5.3 billion globally for the use of infrastructure, and approximately SEK 3.6 billion of this amount was attributable to SAS Airline's own costs. SAS Airline has only administrative responsibility for the rest of these taxes and charges. The infrastructure costs correspond to 12.4% of SAS Airline's operating revenue, as compared to 13% in 2000.

Environmental charges

The environmental charges, which are included in the infrastucture costs, are intended to cover the costs associated with particular environmental measures, such as noise measurement systems and noise insulation of properties outside the airport area. The noise charges also cover the cost of compensatory purchases of properties condemned due to noise levels. The environmental charges are normally linked to the

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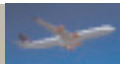
SAS Airline



aircraft's environmental characteristics and included in landing fees. In 2001 SAS Airline paid a total of MSEK 29.5 (14) in environmental charges, which corresponds to 0.5% of the infrastructure charges. Sweden accounts for around half of the noise charges, and the charges are used to cover noise insulation costs for properties near airports. The environmental charges paid by SAS Airline during the most recent five-year period are illustrated in the following table.

Environmental charges

[MSEK]

Items affecting the statement of income	1997	1998	1999	2000	2001
Noise charges	6	7	14	13	29
Night charge (Norway/Gardermoen)	–	–	2	1	0.5
Total	6	7	16	14	29.5

Environmentally related charges

A distinctive characteristic of environmentally related charges is the fact that they need not correspond to any specific environmental costs. They have been implemented solely to favor the airlines that use aircraft with better environmental performance than others. Operators who replace their aircraft with aircraft that have better environmental performance should thus be able to lower their costs in relation to their competitors.

Environmentally related charges and environmentally related charges are implemented primarily for noise. There are, however, ongoing discussions in a number of coun-

Bookmarks in article

SAS Airline

tries concerning whether environmentallly related charges based on the aircraft's hydrocarbon and nitrogen oxide emissions should be introduced. Sweden and Switzerland are already adopting such systems.

A uniform EU model is being prepared within the framework of the European Civil Aviation Conference, ECAC. This model is designed in part on the Swedish system, which is based on the volume of an aircraft's nitrogen oxide emissions. The European Commission is participating in these efforts, and it will not be surprising if the EU adopts this model as an EU Recommendation, in the same manner as the corresponding ECAC model for noise based landing fees.

Emissions based landing fees

The Swedish and Swiss systems for emissions based landing fees differ. While Sweden's system for such landing fees only takes nitrogen oxides into account, Switzerland looks at both the volume of hydrocarbons and nitrogen oxides that are emitted by the aircraft.

In 2001 SAS Airline reduced its emissions charges from MSEK 49 to MSEK 34 in Sweden alone as a result of phasing in new aircraft. The general landing fee discount, as compensation for emissions charges, is MSEK 44.

Noise based landing fees

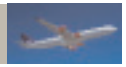
Aircraft noise is an environmental problem that has been given more attention in recent years and entailed higher costs for SAS Airline and other airlines. Most countries have introduced noise based landing fees that reward the quietest aircraft with lower fees.

Bookmarks in article

Links

- ECAC

SAS Airline



The noise charges are a source of revenue for the airport operators not normally earmarked to cover a specific real cost. This means that the airport operators are forced as a rule to increase their noise charges in pace with the airlines' investments in a quieter aircraft fleet unless they are able to reduce their overall costs to compensate for lower revenues.

The environmentally related charges paid by SAS Airline during the most recent five-year period are illustrated in the following table.

Environmentally related charges

[MSEK]

Items affecting the statement of income	1997	1998	1999	2000	2001
Environmental charge on emissions (Sweden)	–	49	51	49	34
Extra costs in the form of noise charges for use of existing Chapter 2 aircraft	50	39	33	–	–
Total	50	88	84	49	34

Environmentally related taxes

In addition to infrastructure costs, SAS Airline pays environmentally related taxes. In 2001 SAS Airline's costs attributed to environmentally motivated passenger charges in Denmark and Norway, the environmentally related fiscal carbon tax in Norway, and the environmentally related portion of the energy tax in Denmark totaled MSEK 960 (MSEK 849).

Bookmarks in article

SAS Airline

The environmentally related taxes paid during the most recent five-year period are illustrated in the following table.

Environmentally related taxes

[MSEK]

Items affecting the statement of income	1997	1998	1999	2000	2001
Passenger charge (Denmark)	–	215	208	209	238
Passenger charge (Norway)	475	601	768	593	671
Carbon tax (Norway)	–	–	48	40	45
Environmental charge on energy (Denmark)	–	–	4	7	6
Total	475	816	1028	849	960

Summary of external environmentally related costs

The aggregate total for the aforementioned external environmentally related costs, such as environmental charges and environmentally related charges and taxes during the period from 1997 to 2001 was as follows:

Total external environmentally related costs

[MSEK]

Summary of external environmentally related costs	1997	1998	1999	2000	2001
Total	531	911	1128	912	1 024

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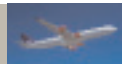

Other environmentally related costs

In 2001 SAS Airline's other environmentally related costs attributed to waste management, environmental share of purification plant costs, etc., totaled MSEK 45 (44). The reported costs for the environmental organization (central staffs, consultants and environmental reporting, profiling and environmental sponsorship) totaled MSEK 9.0 (9.0). The other environmentally related costs during the period from 1997 to 2001 are illustrated in the following table:

Other environmentally related costs

[MSEK]

Items affecting the statement of income	1997	1998	1999	2000	2001
Waste management, operation of purification, plants, permits, etc.,	17	19	24	21	21
Depreciation of environmental investments	–	–	–	21	22
Separate costs for environmental activities	6	7	8	9	9
Tax on aluminum cans (Norway)			1	2	2
Total	23	26	33	53	54

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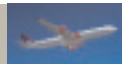

Other items affecting the statement of income

In addition to the costs reported above, SAS Airline's statement of income is affected by direct environmentally related revenues (there are, however, no such revenues to report), as well as items such as environmentally related cost reductions as a result of upgrading the aircraft fleet, negotiated landing fee discounts as a result of the improved environmental performance of the aircraft and improved waste management. The reported income enhancing items of this type during the period from 1997 to 2001 are illustrated in the following table:

Other items affecting the statement of income

[MSEK]

Items affecting the statement of income	1997	1998	1999	2000	2001
Environmentally related revenues	–	–	–	–	–
Reduction in landing fees due to phase-out of Chapter 2 aircraft	25	11	10	–	–
Discount on landing fees (Sweden)	–	–	42	44	44
Reduction in costs due to reduction in waste volumes, improved pre-sorting and increased recycling	15	8	8	8	33
Total	40	19	60	52	77

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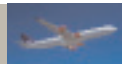


Items affecting the balance sheet

In 2001 SAS Airline's environmental investments totaled MSEK 40.1, MSEK 20 of which referred to environmentally related additional costs for DAC engines. MSEK 20.1 referred to environmentally related investments in ground operations, primarily in the form of purification plants at Gardermoen and Kastrup.

The reduction in investments in relation to 2000 (see table below) is attributed to the fact that the major environmental investments in DAC engines have been completed.

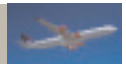
For the 2001 accounting year, SAS Airline did not make any environmentally related provisions, as was also the case for earlier years during the period from 1996 to 2001. As in earlier years, the company did not have any environmentally related contingent liabilities. See also the following table:

Items affecting the balance sheet

[MSEK]	1997	1998	1999	2000	2001
Investments					
Flight operations		40	65	95	20
Ground operations	25	72	27	15	20.1
Total	25	112	92	110	40.1
Environmental investments as a percentage of SAS's total investments (%)	0.8	1.8	1.5	1.1	0.3
Provisions and contingent liabilities					
Environmentally related provisions	–	–	–	–	–
Environmentally related contingent liabilities	–	–	–	–	–

Bookmarks in article

SAS Airline



Emissions trading

Although international air traffic has indeed been left out of the Kyoto Protocol, the UN International Civil Aviation Organization (ICAO) has been assigned the task of studying how the airline industry can help to shoulder the responsibility for reducing greenhouse gas emissions. The ICAO is studying primarily how the airline industry can be incorporated into a system for the trading of carbon dioxide emissions rights. The airline industry, which will be fossil fuel dependent for the foreseeable future, will be a net buyer of emissions quotas. At present it is not possible to form an overall picture of the potential consequences for the company's bottom line.

Environmentally related business risks and opportunities

Well-planned and proactive environmental activities reduce the risk of violating environmental regulations, which can lead to negative publicity as well as direct costs in the form of fines and damages claims. Offensive environmental activities also reduce the risk of being caught off guard by new and more stringent environmental requirements from the market or the authorities. SAS can gain a competitive advantage by anticipating legal or tax-related requirements.

The table "Environmentally related business risks and opportunities" describes SAS Airline's most important environmentally related aspects in relation to other business risks and opportunities (see next page).

Bookmarks in article

Links

- ICAO
- Kyoto Protocol

SAS Airline

Environmentally related business risks and opportunities

Environmental aspects	Business risks	Business opportunities
Fuel consumption	• Sensitivity to market-based and politically motivated changes in oil prices and taxes.	• Better technical performance of aircraft and engines leads to reduced fuel consumption.
Air, soil and water emissions and noise	• More stringent emissions and noise regulations in the future. • Increased investment requirements to meet new emissions and noise regulations. • Increased investment requirements to meet new emissions and noise regulations.	• Better technical performance of SAS Airline's facilities gives lower costs and safer operations. • Better technical performance of aircraft and engines and more passengers per flight yield better fuel economy and lower costs for emissions per passenger kilometer. • Better technical performance of aircraft and engines makes it easier for SAS Airline to comply with future noise-related requirements.
Waste	• Sensitivity to new legal or tax regulations and subsequent investment requirements.	• Investments and better routines for efficient utilization of resources and/or recycling systems can reduce waste volumes and waste management costs.

SAS Airline

Environmental aspects	Business risks	Business opportunities
Structure of the aircraft fleet	• Due to new certification standards and lower noise level requirements for aircraft, parts of the aircraft fleet may have to be phased out faster than planned or may only be used for certain destinations. There is a risk of investment requirements and/or write-downs.	• An aircraft fleet with a low average age, where the best commercially available technology is systematically sought, presumably has a high technical performance that can more easily live up to future environmental standards, taxes and regulations.
Contamination of the soil and water	• Contamination of the soil and water may render SAS Airline liable to carry out remediation measures.	• Facility assets that are not contaminated are easier to sell or mortgage.
Local impact such as noise, regional and global impact such as carbon dioxide	• Local noise restrictions at various airports can have a negative effect on the average capacity utilization of the aircraft fleet. • International climate conventions can affect SAS Airline's investment requirements and costs.	• An aircraft fleet with a low average age, where the best commercially available technology is systematically sought, is better equipped to meet new environmental standards and regulations, and it enables lower emissions-related taxes and charges. It will also result in less of a need to purchase emission rights in the future, if such trading is implemented.
Environmentally related investments		• SAS Airline can gain a competitive advantage by anticipating legal or tax-related requirements.

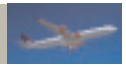
SAS Airline

Environmental aspects	Business risks	Business opportunities
Insurance against environmental damage	• Financial risk exposure in the event of incidents causing environmental damage.	• Documented efficient environmental management may result in lower insurance costs.
Compliance with laws and regulations	• Violation of environmentally related laws and regulations that govern operations increases the risk of criticism from the market and media, as well as the risk of damages claims.	• Training and an efficient internal follow-up system reduce the risk of violating laws, regulations and policies. • Credible information about the company's ability to comply with laws and regulations enhances its market position and image, and it prevents adverse publicity-
Ongoing and previous environmentally related lawsuits, damages claims and injunctions	• Can generate negative publicity and undesirable market reactions if information is not disclosed in an open and credible manner.	• Consistent disclosure of any significant information to the market will help to improve the company's environmental image
Market position with regard to ecoefficiency	• SAS Airline's ambition to be a leader in the airline industry must be supported by credible internal environmental activities, otherwise there is a risk that external observers will question SAS Airline's external communication.	• By working systematically towards the goal of being a leader in the airline industry, the company improves its market position and thereby creates a favorable platform for future value growth.

SAS Airline

Environmental aspects	Business risks	Business opportunities
The management's approach to environmental issues	• If the company's management fails to communicate its environmental commitment (internally and externally), the credibility of SAS Airline's environmental work will be questioned.	• The management's commitment is crucial for making the advances needed for SAS Airline to take advantage of the business opportunities generated by effective and systematic environmental activities.
Organizational support for environmental responsibility	• Gradually declining interest in environmental issues within the company.	• Through operational management and other regular reviews by the management, suggested improvements are better assimilated and the risk of accidents and incidents is reduced.
Environmental work of subcontractors	• Inadequate environmental work performed by a subcontractor will also have a negative impact on SAS Airline.	• A higher environmental standard can be more esasily safeguarded through SAS Airline imposing requirements on following up subcontractors.
Environmental communication	• Inadequate or incomplete information, where only positive events and results are disclosed, creates suspicion and reduces the credibility of SAS Airline's honest intentions.	• Open and honest communication, where negative events are also disclosed, will strengthen SAS Airline credibility and improve the company's image.

SAS Airline



Key performance indicators

The chief principle for selecting environmental performance indicators is their close connection with SAS's overall financial or environmental targets. They are also intended for use for internal planning, management and follow-up, as well as for both internal and external evaluation and analysis of SAS's progress in environmental matters.

The most important environmental performance indicator is SAS Airline's environmental index, which measures the progress in that business area's ecoefficiency.

In addition to SAS's environmental index, SAS has chosen to report the following environmental performance indicators in this environmental report (definitions of key terms are found in the section "Reporting principles"):

- The impact of environmental efforts on SAS Airline's image
- External environmentally related costs
- Impact on CFROI of external environmentally related costs
- Impact on EBITDAR of external environmentally related costs
- External environmentally related costs per RPK

Ecoefficiency index

SAS Airline's environmental index is a measure of ecoefficiency in this business area. During 2001 the environmental index improved by two points. Comments on the progress of the index since 1996, when it was introduced, are found in the section "Environmental index." There you will find a report of the environmental index in the underlying flight, cabin and ground operations.

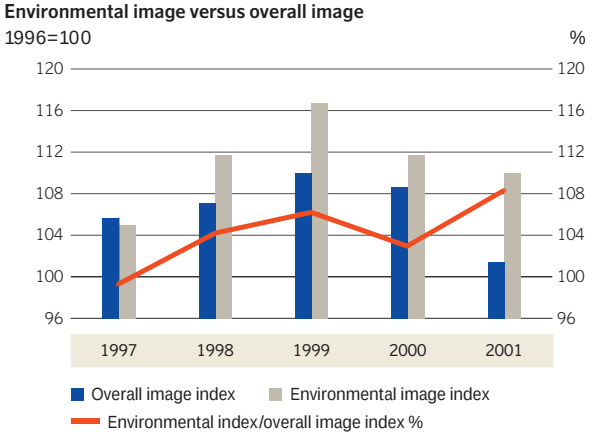
Bookmarks in article

Read also

SAS Airline

Effect of environmental work on SAS Airline's image

The SAS Group is not able to report any direct environmentally related revenues. The environmental activities do, however, have an indirect effect on the value of our brand. The diagram “Environmental and overall image index” clearly illustrates that environmental activities make a positive contribution to building SAS Airline's image. In 2001 the value of SAS Airline's overall and environmental image fell. The value of the environmental image fell, however, significantly less than SAS Airline's overall image. The reason for this is not clear.



Measurement of SAS’s image incorporates eight subfactors – high level of safety, successful, professional, customer-driven, modern and innovative, environmentally aware, reliable and rethis is a positive contribution to the Scandinavian image.

Bookmarks in article

SAS Airline

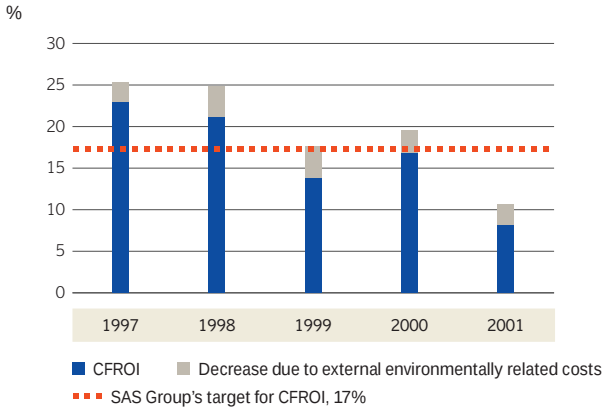
Effect of external environmentally related costs on CFROI and EBITDAR

If the SAS Group is to remain independent in a changing airline industry, then its market value must increase significantly. The SAS Group's overall financial objective is to generate value for its shareholders. The SAS Group's goals for the coming five-year period are:

- To achieve an average CFROI of at least 17% per year
- To increase operating revenues by an average of 14% per year with 2000 as the base year

CFROI is the SAS Group's primary rate of return concept, since this key perform-

Effect of external environmentally related charges on CFROI



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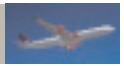
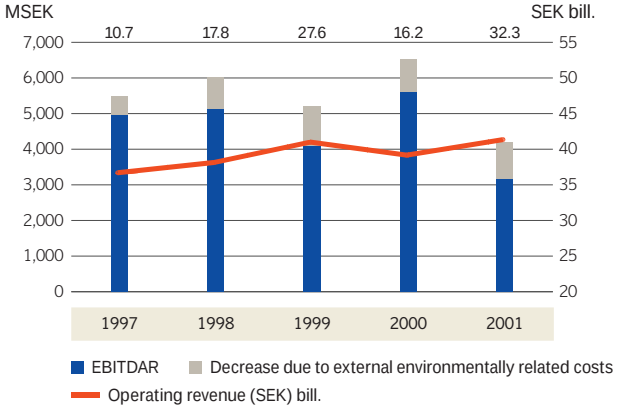


ance indicator best illustrates the return generated by the operations in relation to the actual capital employed. This measure of return reflects the EV/EBITDAR multiple, which is regarded internationally as the most important key financial performance indicator for airlines and used by a majority of the airline industry analysts.

The diagram on the preceding page illustrates how much SAS Airline's external environmentally related costs reduce CFROI. The diagram also illustrates the development of SAS Airline's operating revenues for the period.

Environmentally related taxes and charges in relations to EBITDAR



This diagram illustrates the effect of SAS Airline's external environmentally related costs on EBITDAR. The diagram also illustrates the development of SAS Airline's operating revenues for the period. Environmental activities have a positive impact on

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SAS Airline

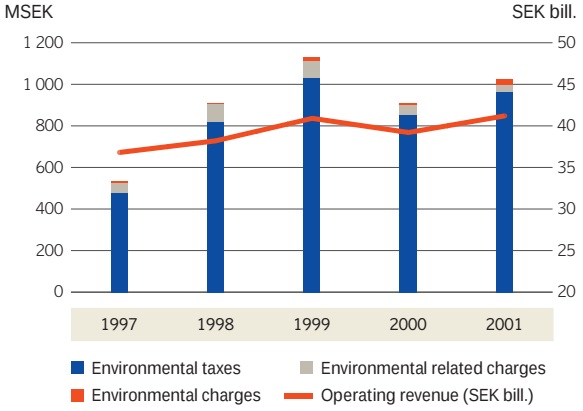
the results (expressed by EBIDAR, for example) of SAS Airlines and consequently the SAS Group. This impact can, however, not be expressed in any meaningful way.

Investments in the best commercially available technology in the airline business yield lower fuel consumption and reduced emissions per passenger kilometer, as well as relatively lower environmental and environmentally related charges. Eco-compliant purchasing and recycling of waste gives lower waste management costs. Less wastage and better resource management are other cost-reducing effects of environmental activities.

External environmentally related costs

This key performance indicator illustrates any changes in SAS Airline's external envi-

External environmentally related costs and operating revenue



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SAS Airline

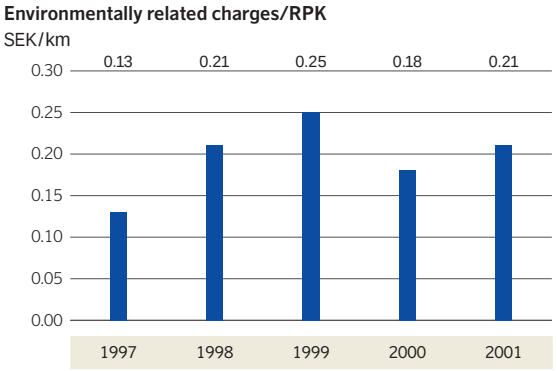
ronmentally related costs. In order to facilitate an evaluation of cost trends, a graph illustrating the performance of SAS Airline's operating revenue during the same period has been added to the diagram.

This diagram illustrates that SAS Airline's external environmentally related costs have risen again. This is attributed primarily to an increase in the environmentally related taxes in the form of higher passenger charges in Norway, which rose to MSEK 671 (593).

External environmentally related costs per RPK

This key performance indicator shows how much airline, passengers pay on average for returned environmentally related costs per kilometer flown.

The diagram shows that the external environmentally related cost per RPK



Bookmarks in article

SAS Airline

increased in 2001 compared with 2000. The reason is that RPK has fallen at the same time as SAS Airline's external environmentally related costs have increased.

In 2001, SAS Airline paid an average of SEK 0.21 per RPK in external environmentally related costs. Based on this average cost, airline passengers would, for example, have to pay SEK 113 in external environmentally related costs for a trip from Oslo to Copenhagen.

Sensitivity analysis

To show how the reported results are affected by the input data, some illustrative examples are given below:

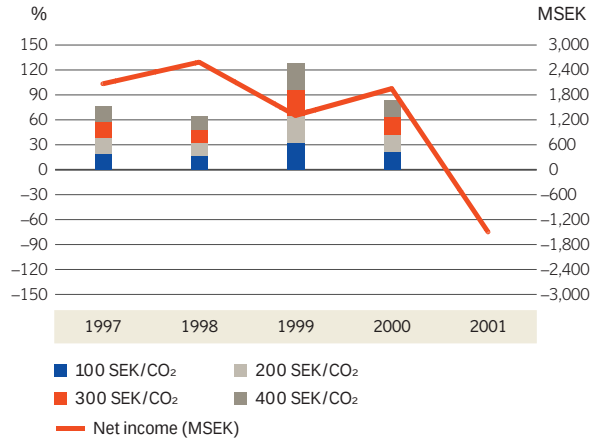
- A 1% change in fuel consumption corresponds to approx. 41,000 tonnes of CO_2 and an income effect of around MSEK 40.

Bookmarks in article

SAS Airline

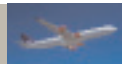
- A 1% increase in the cabin factor leads to a 19% improvement in fuel efficiency to 48 g/RPK.
- SAS Airline's net income for 2001 was MSEK –1,499. If SAS were to buy emissions rights for its total carbon dioxide emissions at a cost of SEK 300 per tonne of CO_2, then the net income for 2001 would be reduced by a further MSEK 1,233. The diagram below shows the percentage effect of a hypothetical emissions quota price on SAS's net income for the years 1997 to 2000, when the net income was positive. The income before taxes for the period from 1997 to 2001 has been included in the diagram as a reference.

Effect of quota price on net income



Bookmarks in article

SAS Airline



Future outlook

A new noise certification class, Chapter 4, has been introduced but applies only to new aircraft and will take effect in 2006. All of the aircraft that SAS Airline is currently buying are in compliance with the lower noise levels in chapter 4 as opposed to the existing MD80 fleet, which will not be in compliance. This may affect the value of the aircraft, especially if airports start to implement Chapter 4 as an operational limitation. This is, however, not really the intention.

The continued phasing-in of new aircraft, primarily the Airbus A321s, A340s, deHavilland Q400s and Boeing 737s places SAS Airline in a relatively favorable position with a view to performance dependent environmental charges and environmentally related charges and environmental regulations.

Bookmarks in article

Read also

SAS Airline

Accounts

The following pages contain diagrams showing environmental data and description of their progress over a five-year period, in both absolute and relative terms. The diagrams are divided among the areas flight, ground and cabin. Comments on progress are found under each diagram.

- Flight operations
- Ground operations
- Cabin operations

Read also

- Reporting principles
- Accounts, Airline Related Businesses
- Accounts, Rezidor SAS Hospitality

Subsidiary & Affiliated Airlines

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This is Subsidiary & Affiliated Airlines

Subsidiary & Affiliated Airlines includes the subsidiaries Braathens, Air Botnia, Spanair (there is an agreement to increase SAS's stake in 2002) and Widerøe's Flyveselskap and the affiliated airlines Skyways Holding, Cimber Air, British Midland, airBaltic and Grønlandsfly.

With its acquisition of Braathens and change of stake in Spanair, SAS Airline can further expand its operations and make more efficient use of Copenhagen as an SAS hub. The Braathens acquisition also provides room for synergies in 2002 estimated at approx. MSEK 800.

For a report on the civil aviation world, see the section "SAS Airline and the world around us".

Links

- Braathens
- Air Botnia
- Spanair
- Widerøe
- Skyways
- Cimber
- British Midland
- airBaltic
- Grønlandsfly

Subsidiary & Affiliated Airlines

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Highlights of 2001

- Major efficiency and environmental benefits can be achieved when SAS and Braathens, which merged in 2001, can coordinate their operations.
- Widerøe has adopted measures to reduce the use of deicing liquids.
- Air Botnia renewed its entire fleet in 2001 and now boasts one of the youngest aircraft fleets in Europe.

Subsidiary & Affiliated Airlines

Key performance indicators

Environmental performance indicators

	1999	2000	**2001**
Emissions of carbon dioxid (CO_2), Braathens, 1,000 tonnes	452	419	**404**
Emissions of carbon dioxid (CO_2), Air Botnia, 1,000 tonnes	43	88	**92**
Emissions of carbon dioxid (CO_2), Widerøe, 1,000 tonnes	101	97	**95**

Key figures Widerøe and Air Botnia[1]

	2000	**2001**
Operating revenue, MSEK	2,568	**3,123**
Earnings before depreciation and leasing costs, EBITDAR, MSEK	376	**510**
Earnings before depreciation, EBITDA, MSEK	257	**317**
Income before tax, MSEK	106	**7**
Number of aircraft (incl. Braathens)	[2]	**75**
Number of passengers, scheduled, million	1.8	**2.0**
Number of destinations	52	**51**
Number of daily departures	320	**306**
Average number of employees	1,495	**1,530**

[1] *Braathens' results are not consolidated in the SAS Group in 2001. Braathens is included in the SAS Group's consolidated balance sheet at December 31, 2001 and therefore in the Group's aircraft fleet. Spanair is consolidated according to the equity method with 49%.*

[2] *Information not avaliable..*

Subsidiary & Affiliated Airlines

Resource use and environmental impact

On the next pages is an overview of the airlines' main environmental impact and how it arises.

Flight operations

IN	The airlines' transport	Operation/ use
Aviation fuel Supplier: – Oljebolag	– [1]	Flight – Combustion in engine
–	–	– Fuel jettisoning
Motor oil, etc. Supplier: – Oil company	From storage to hangar/ramp	Flight – Combustion in engine – Oil drainage (oil fog)
	–	–Takeoff and landing

OUT	Activity	Final treatment/ environmental aspect	Significant environmental impact
Carbon dioxide	–	Emissions into air	Greenhouse effect
Water vapor			Greenhouse effect
Hydrocarbons			Greenhouse effect, ground level ozone
Nitrogen oxides			Greenhouse effect, acidification, ground level ozone, depletion of the ozone layer, eutrophication
			Consumption of non-renewable resources
Fuel vapor **– Carbon dioxide** **– Hydrocarb ons**	–	Emissions into air (a small portion can reach the ground)	 Greenhouse effect Ground level ozone
Koldioxid	–	Emissions into air	Greenhouse effect
Oil aerosols	–	Emissions into air	Greenhouse effect
Noise	–	–	Disruption

[1] *No transports under the airlines' management.*

Subsidiary & Affiliated Airlines

Cabin operations

IN	The airlines' transport	Operation/ use
Food, (incl. packaging) Supplier: – Catering companies	–[1]	Consumption
Beverages (incl. packaging) Supplier: – Dairies – Breweries – Wine & spirits importers	–[1]	Consumption
Disposables Misc. suppliers	–[1]	Cabin service

OUT	Activity	Final treatment/ Environmental aspect	Significant environmental impact
Organic waste/ (leftover food) **Packaging:** – Paper – Plastic – Aluminum	Presorting (partly) Transport	Incineration/ energy extraction Landfill	Greenhouse effect, acidification, ground level ozone, use of land, eutrophication
Packaging, unopened beverages – Glass – Plastic – Cardboard – Aluminum	Presorting (partly) Transport	Incineration/ energy extraction Landfill Reuse Recycling	Greenhouse effect, acidification, ground level ozone, use of land, eutrophication
Waste – Plastic – Paper – Cotton – Aluminum	Presorting transport	Incineration/ energy extraction Landfill	Greenhouse effect, acidification, ground level ozone, use of land, eutrophication

[1] *No transports under the airlines' management.*

Subsidiary & Affiliated Airlines

Cabin operations

IN	The airlines' transport	Operation/ use
Non-disposable articles Supplier: – Plastic and textile producers. – Tableware manufactures – Packaging suppliers	–[3]	Cabin service
Goods for sale Misc. suppliers	From storage to aircraft	Sales to customer
Magazines/ newspapers Supplier: – Publishers/ distributors	From transit warehouse to aircraft/ lounges	Cabin service
Chlorinated water Suppliers: – Municipal water works – Chlorine suppliers	From storage to aircraft	From warehouse – In lavatories – In galleys
Germicides[2] From suppliers	From filling site to aircraft	Added as sanitizing fluid in lavatories

OUT	Activity	Final treatment/ Environmental aspect	Significant environmental impact
Used semi-disposable articles – Porcelain – Melamine plastic – Glass – Stainless steel – Cotton	Washing/ laundering	Reuse	Water consumption, energy consumption, contamination of water and land, eutrophication
Sold articles	–[1]	–[1]	–[1]
Unsold articles	Transport to warehouse Repackaging	Return to sales	
Paper waste	Sorting	Reuse Recycling Incineration/ energy extraction Landfill	Greenhouse effect, acidification, ground level ozone, use of land
Waste water	Drainage Transport	Municipal waste sewage	–
Lavatory waste	Drainage Transport	Municipal waste sewage	–

[1] Depending on customer's handling [2] Antibacterial and antiviral compound. [3] No transports under the airlines' management.

Subsidiary & Affiliated Airlines

Ground operations

IN	The airlines' transport	Operation/ use
Glycol From supplier	From storage to aircraft	Deicing of aircraft
Urea/acetate From supplier	–[1]	Deicing of runways
Water From supplier: – Municipal waste water treatment plant	–[1]	Washing of aircraft/vehicles Extinguishing of fires Transport of organic waste
Halons From own storage	Between stations and from storage to aircraft	Extinguishing of fires on board

OUT	Activity	Final treatment/ environmental aspect	Significant environmental impact
Spillage	Collection Transport Leakage	Reuse Emissions into soil and water	Eutrophication
Spillage	Collection (limited) Transport	Emissions into soil and water	Eutrophication
Waste water	Drainage into municipal sewer	Municipal waste sewage	Contamination of water
	Drainage into own drains with separator	Drainage of own separators (to hazardous waste)	Contamination of water
Halons (consumption)	–	Emission into air	Depletion of the ozone layer, greenhouse effect

[1] *No transports under the airlines' management.*

Subsidiary & Affiliated Airlines

Ground operations

IN	The airlines' transport	Operation/ use
Freon[2] From supplier	–[1]	Air conditioning Cooling of machinery
Maintenance materials • **Components, etc.** • **Chemicals** Misc. suppliers	From storage to appropriate site	Maintenance of aircraft, of use vehicles, equipment, buildings and land
Energy • **Oil** • **Gasoline, diesel** • **Biofuels** • **Gas** • **Electricity**	–[1]	Fuel Heating Cooling Electricity
Office supplies Misc. suppliers	–[1]	Administration

OUT	Activity	Final treatment/ environmental aspect	Significant environmental impact
Freon (leakage)	–	Emission into air	Depletion of the ozone layer, greenhouse effect
Hazardous waste machinery,	Presorting (predominant) Transport	Recycling Reuse Destruction Incineration Landfill Treatment Emissions	Greenhouse effect, acidification eutrophication, contamination of soil and water, noise
Sulfur dioxide **Carbon dioxide** **Hydrocarbons** **Nitrogen oxides** **Soot/particulates**	–	Emissions into air	Greenhouse effect, ground level ozone, acidification, eutrophication
Waste	Transport	Recycling Incineration Destruction Landfill	Greenhouse effect, contamination of soil and water

[1] *No transports under the airlines' management.*

Subsidiary & Affiliated Airlines

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This is Spaniar

Spanair was formed by SAS and the Spanish company Teinver in 1986. Operations started in March 1988. Spanair was initially a charter airline which served the SAS Leisure Group, among others. In February 1994, Spanair started scheduled airline operations. Scheduled flights have shown very strong growth since then and today account for 74% of Spanair's flights.

The fleet comprises 48 aircraft. The number of passengers in 2001 amounted to 8.1 million (incl. charter) and 5.7 million excluding charter. The number of employees at year-end was 2,438.

Spanair is Spain's second largest airline and investments in capacity and slots gave Spanair a 24.5% share of the Spanish domestic market in 2001. Spanair also has 14% of the landing rights at Madrid's Barajas Airport, which is of major strategic value. Spanair started intercontinental flights in November 1997, a venture which subsequently proved to be strategically incorrect.

Key performance indicators[1]

	1998/99[1]	1999/00[1]	**2000/01[1]**
The SAS Group's holding	49	49	**49**
Operating revenue, MEUR	504	611	**778**
EBITDAR, MEUR	95	42	**53**
EBITDAR, margin	18,8	7,0	**6,8**
CFROI, %	16	5	**4**

[1] *Fiscal year November 1–October 31*

Links

- Spanair
- Madrid Barajas airport

Subsidiary & Affiliated Airlines

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This is Braathens

Founded in 1946, Braathens has 4,600 employees. Its aircraft fleet numbers 33, 17 Boeing 737-500s, 5 Boeing 737-400s, and 11 Boeing 737-700s. Average age of the fleet was 7.1 years. In 2002 the fleet will be reduced to 23 aircraft. In 2001 Braathens flew a total of 5.8 million passengers.

Following acute financial difficulties, Braathens invited SAS to assume ownership. The business arrangements were ready in December 2001. Braathens will continue to operate under its own name, but both companies are coordinating their operations on Norwegian domestic routes, thereby achieving major efficiency and environmental benefits.

To provide a comprehensive and efficient traffic system with less environmental impact, the companies' airline networks will be restructured before April1, 2002. In 2001, Braathens' production increased to 6,125 MATK and RPK to 3,550 MRPK. At the same time, Braathens fuel consumption was 247,041 (250,449) m^3 on domestic and international flights. Emissions of carbon dioxide on domestics flights decreased by 3.6% to 404 (419) ktonnes. Emissions of carbon dioxide per RPK increased to 196 (191) g/RPK. Braathens' cabin factor decreased by 0.8% in 2001 to 54.7 (55.5)%.

Braathens has exceeded the permitted threshold for emission of heavy metals from aircraft cleaning operations at its technical base in Stavanger. MNOK 2.5 has been allocated for a new cleaning facility, which will come on line in June 2002.

Links

- Braathens

Subsidiary & Affiliated Airlines

Key performance indicators [1]

	1999	2000	**2001**
The SAS Group's holding, %	0	0	**98,5**
Operating revenue, MNOK	5,241	5,807	**6,013**
EBITDAR, MNOK	–244	318	**505**
EBITDAR, marginal, %	–4.6	5,5	**8,4**
EBITDA, MNOK	–618	–362	**–167**
CFROI, %	–4.4	4,9	**8.0**
CO_2-emissions, 1,000 tonnes	451.7	419.3	**404.2**

[1] *Excluding operations in Sweden. Braathens is not consolidated in the SAS Group's income statement for 2001. Braathens will be consolidated in the SAS Group's balance sheet as of 31 December 2001*

Subsidiary & Affiliated Airlines

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This is Widerøe's Flyveselskap

Founded in 1934, Widerøe's Flyveselskap has approx. 1,200 employees. The SAS Group has held a 63.3% stake in the company since 1998. The head office is in Bodø, with an administrative office in Oslo and operating bases in Hammerfest, Bergen, Bodø, Oslo and Sandefjord. Widerøe is Norway's largest regional airline, operating 27 aircraft (various Dash-8 models) and serving 35 destinations in Norway and 5 abroad. Widerøe is part of SAS's traffic system on domestic and foreign routes. The routes Sandefjord/Torp – Stockholm, Copenhagen, Bergen – Stavanger, Stavanger – Aberdeen and Oslo – Gothenburg supplement SAS Airline's route system.

Widerøe's production in 2001 was 709 (725) MASK. The cabin factor was 50.2%. Fuel consumption was approx. 38,000 (39,000) m^3, yielding carbon dioxide emissions of 94.5 (97) ktonnes. Measured per available seat kilometer carbon dioxide emissions were 133 (134) g/ASK.

The company's largest environmentally related cost in 2001 consisted of a carbon tax in Norway totalling MNOK 9.9.

Glycol consumption increased in 2001 to 110,000 liters. The use of deicing liquids represents a major expense and negative environmental impact. To reduce the quantity of deicing liquids, Widerøe's has purchased its own equipment to blow snow off the aircraft before applying the deicing liquid.

Widerøe's Flyveselskap has an environmental vision, policy, overall environmental goals and an environmental strategy, which, however, has not been implemented.

Links

- Widerøe's Flyvelselskap

Subsidiary & Affiliated Airlines

In 2001 the company was not involved in any disputes and no incidents or infringements of environmentally related permits were reported. Complaints for violations of noise restrictions at Copenhagen airport were, however, lodged.

Key performance indicators

	1999	2000	**2001**
SAS Group's holding, %	63.3	63.3	**63.3**
Operating revenue, MSEK	1,699	1,851	**2,135**
EBITDAR, MSEK	145	318	**371**
EBITDAR, marginal, %	8.6	17.2	**17.4**
EBITDA, MSEK	119	224	**254**
Income before tax, MSEK	–94	56	**79**
CFROI, %	8.6	15.5	**16.5**
CO_2-emissions, 1,000 tonnes	100.8	97.1	**94.6**

Subsidiary & Affiliated Airlines

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This is Air Botnia

With 303 employees, Air Botnia has been 100% owned by the SAS Group since 1998. Air Botnia operates 10 aircraft with 66 daily flights serving 11 destinations. The company is part of SAS Airline's route system and contributes toward the development of new markets. Its products, timetables and services are coordinated with SAS Airline's.

Air Botnia offers competitive feeder traffic to and from Finland, primarily to Stockholm and Copenhagen, but also to Oslo and Gothenburg as well as other Nordic destinations. Together, Air Botnia and SAS Airline operate more than 100 daily flights between Finland and the three Scandinavian countries.

In 2001 Air Botnia's fuel consumption increased to approx. 37,000 (35,000) m^3, yielding carbon dioxide emissions of 92.1 (88.1) ktonnes.

In yearly 2001 Air Botnia frequently violated Gardermoen's rules prohibiting take-offs and landings with Chapter 2 aircraft after 4:00 p.m. and before 8:00 a.m. The problem was resolved in May 2001 when Air Botnia modernized its entire fleet. The new aircraft fleet, comprising five Avro RJ85s and five SAAB 2000s, fulfills all known present and future environmental standards. At the end of 2001 the average age of the aircraft fleet was 2.6 years, making it one of the youngest fleets in Europe.

Links

- Air Botnia
- Oslo Lufthavn AS

Subsidiary & Affiliated Airlines

Key performance indicators

	1999	2000	**2001**
SAS Group's holding, %	100	100	**100**
Operating revenue, MSEK	265	772	**974**
EBITDAR, MSEK	–113	62	**129**
EBITDAR, marginal, %	–42.6	8.0	**13.2**
EBITDA, MSEK	–165	11	**2**
Income before tax, MSEK	–174	–5	**–33**
CFROI, %	–31	16	**15**
CO_2-emissions, 1,000 tonnes	43.3	88.1	**92.1**

Subsidiary & Affiliated Airlines

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This is Affiliated Airlines

Affiliated Airlines includes a number of regional airlines of which the SAS Group is part owner. In all, there are five airlines supplementing and expanding SAS's route system by flying to and from SAS Airline's traffic hubs on thinly trafficked routes. Skyways, Cimber Air and airBaltic fly under the slogan: "Well connected with SAS."

There is no environment-related information on these companies. For more information, see the SAS Group's Annual Report 2001.

Links

- Skyways
- Cimber Air
- Air Baltic
- SAS Group Annual Report 2001

Subsidiary & Affiliated Airlines

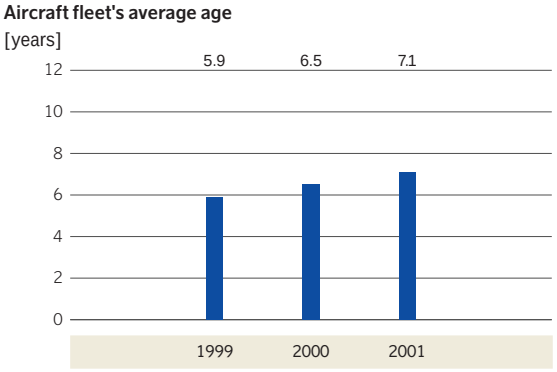
Accounts

Below are a diagram showing the changes in important environmental data for the SAS Group's other airlines, Braathens, Widerøe's Flyveselskap and Air Botnia. The data for the various companies is not comparable because the airlines have used different compilation methods.

- Braathens
- Widerøe's Flyveselskap
- Air Botnia

Subsidiary & Affiliated Airlines

Aircraft fleet, Braathens



Subsidiary & Affiliated Airlines

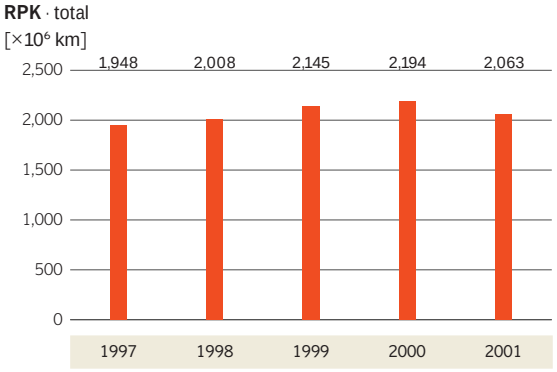
Aircraft fleet, Braathens

Aircraft fleet

Aircraft fleet		1999	2000	**2001**
B737-500	Number of aircraft	18	18	**17**
	Newest aircraft	2.8	3.8	**4.8**
	Oldest aircraft	9.8	10.8	**11.8**
	Average age	7.2	8.2	**9.3**
B737-400	Number of aircraft	5	5	**5**
	Newest aircraft	2.8	3.8	**4.8**
	Oldest aircraft	9.7	10.7	**11.7**
	Average age	7.6	8.6	**9.6**
B737-700	Number of aircraft	7	9	**11**
	Newest aircraft	0.8	0.8	**0.8**
	Oldest aircraft	1.8	2.8	**3.8**
	Average age	1.2	1.9	**2.5**
Total number of aircraft		30	32	**33**

Subsidiary & Affiliated Airlines

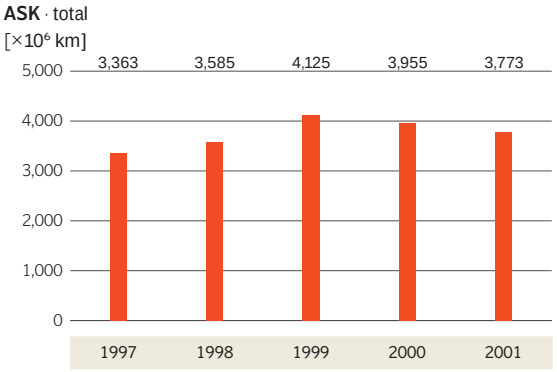
Production – flight operations, Braathens



Background: RPK is a measurement of passenger capacity sold during the year.
Braathens' progress: Due to a sharp market decline toward the end of 2001, there was a slight drop in production during the year.

Subsidiary & Affiliated Airlines

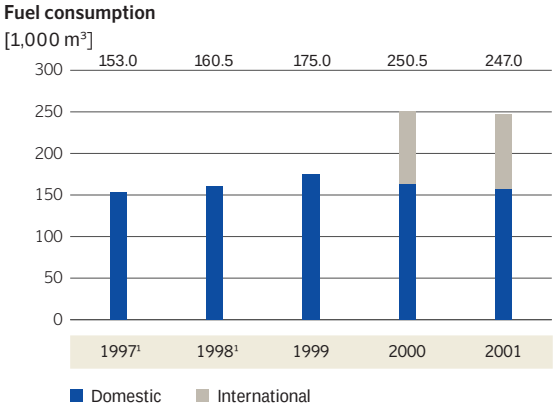
Production – flight operations, Braathens



Background: ASK is a measurement of available (offered) capacity per passenger and is calculated by multiplying the number of seats by the actual distance flown in kilometers.
Braathens' progress: From 2000 to 2001 production measured in ASK shrank from 3,995 to 3,773.

Subsidiary & Affiliated Airlines

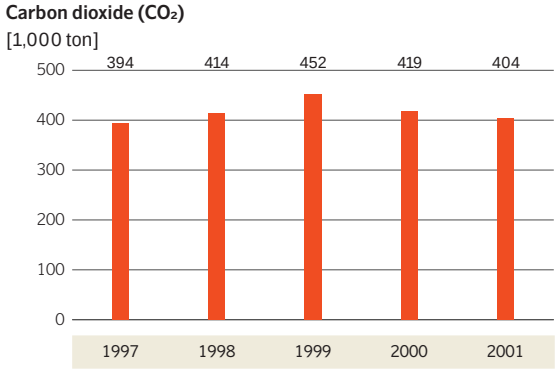
Fuel consumption – flight operations, Braathens



Background: For the foreseeable future aviation will be dependent on fossil fuels, combustion of which generates emissions that impact the environment.
Braathens' progress: Fuel consumption has fallen somewhat during the year due to lower production.

Subsidiary & Affiliated Airlines

Emissions into the air – flight operations, Braathens



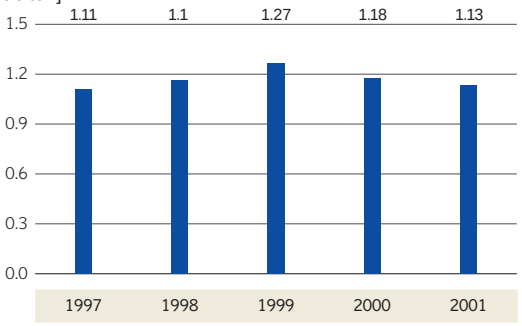
	1997	1998	1999	2000	**2001**
g/RPK	203	206	211	191	**195**
g/ASK	117	116	110	106	**107**

Background: Flight operations' carbon dioxide emissions are calculated on the basis of fuel consumption. 3.15 kg carbon dioxide is produced per kg fuel burned.
Braathens' progress: For Braathens it is crucial to reduce fuel consumption for both environmental and economic reasons. Emissions of CO_2 are directly proportionate to fuel consumption. During 2001 total fuel consumption fell compared with 2000, thereby also lowering CO_2 emissions.

Subsidiary & Affiliated Airlines

Emissions into the air – flight operations, Braathens

Nitrogen oxeides (NOx)
[1,000 ton]

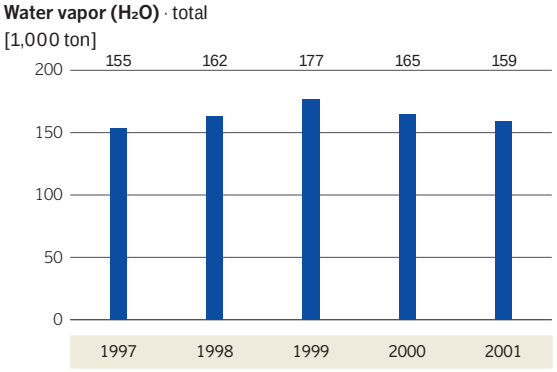


	1997	1998	1999	2000	**2001**
g/RPK	0.57	0.58	0.59	0.54	**0.55**
g/ASK	0.33	0.32	0.31	0.30	**0.30**

Background: Permitted aircraft engine nitrogen oxide emissions are limited by ICAO certification standards, which will be tightened after 2004.
Braathens' progress: The reduction in emissions of nitrogen oxides can be explained by lower production.

Subsidiary & Affiliated Airlines

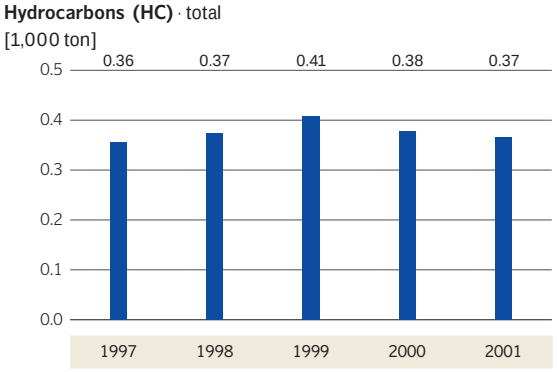
Emissions into the air – flight operations, Braathens



Background: Water vapor is formed in proportion to fuel consumption (1.238 kg water vapor per kg fuel). Water vapor condenses under certain conditions, forming the so-called vapor trails one sees behind aircraft flying at high altitudes. The data suggest a connection between condensates in vapor trails and the formation of cirrus clouds, which likely contributes to the greenhouse effect.
Braathens' progress: The quantity of water vapor formed has fallen somewhat during 2001, which is due to lower fuel consumption.

Subsidiary & Affiliated Airlines

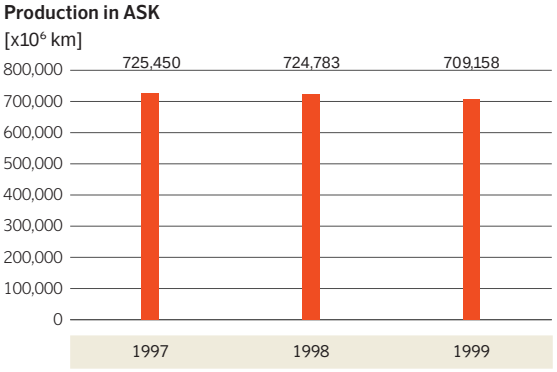
Emissions into the air – flight operations, Braathens



Background: The data refer to those hydrocarbons, excluding other VOCs, covered by ICAO certification standards, which limit aircraft engine hydrocarbon emissions.
Braathens' progress: Braathens' hydrocarbon emissions have fallen somewhat, an improvement due to lower production.

Subsidiary & Affiliated Airlines

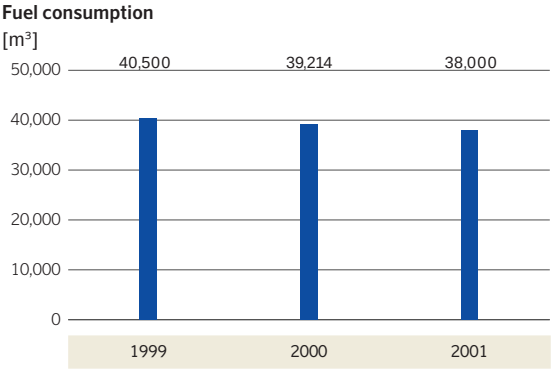
Emissions into the air – flight operations, Widerøe



Background: Background: ASK is a measurement of available (offered) capacity per passenger and is calculated by multiplying the number of seats with the actual distance flown in kilometers.
Widerøe's progress: From 2000 to 2001 production measured in ASK fell from 725 to 709 MASK.

Subsidiary & Affiliated Airlines

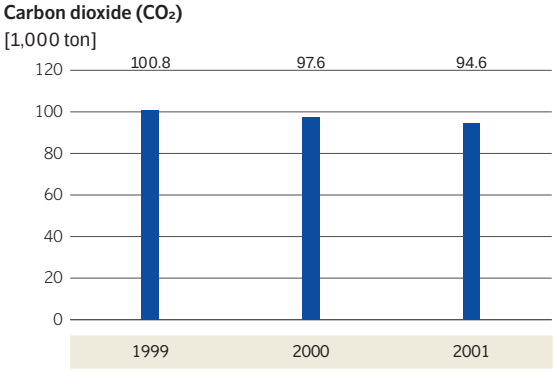
Fuel consumption – flight operations, Widerøe



Background: For the foreseeable future aviation will be dependent on fossil fuels, combustion of which generates emissions that impact the environment.
Widerøe's progress: Fuel consumption has fallen somewhat during the year due to lower production.

Subsidiary & Affiliated Airlines

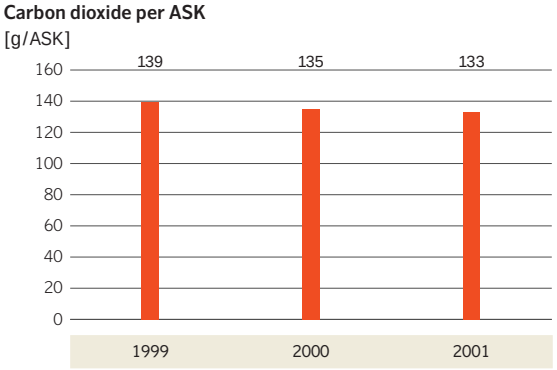
Emissions into the air – flight operations, Widerøe



Background: Flight operations' carbon dioxide emissions is calculated on the basis of fuel consumption. 3.15 kg of carbon dioxide is formed per kg fuel burned.
Widerøe's progress: For Widerøe it is crucial to reduce fuel consumption, for environmental and economic reasons alike. Emissions of CO_2 are in direct proportion to fuel consumption. During 2001 total fuel consumption fell compared with 2000, thereby also lowering CO_2 emissions.

Subsidiary & Affiliated Airlines

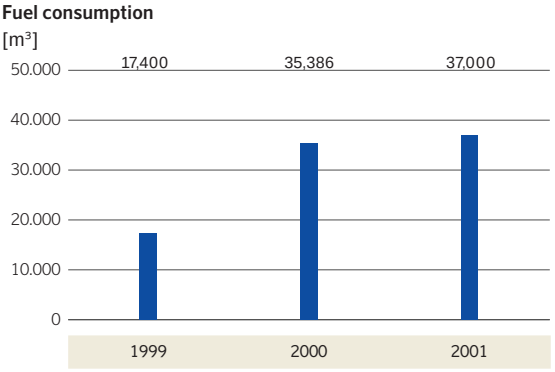
Emissions into the air – flight operations, Widerøe



Background: Carbon dioxide emissions per ASK measures how much carbon dioxide is produced per utilized seat kilometer.
Widerøe's progress: In recent years carbon dioxide emissions per ASK produced have fallen, which implies increased ecoefficiency.

Subsidiary & Affiliated Airlines

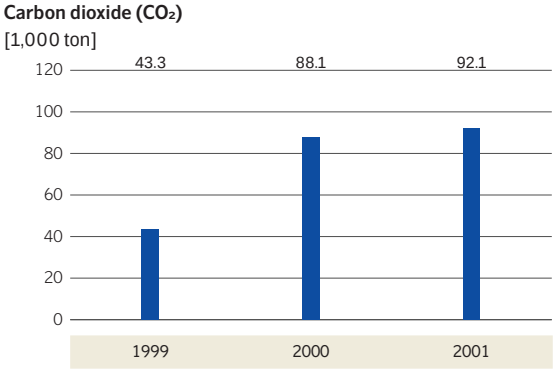
Fuel consumption – flight operations, Air Botnia



Background: For the foreseeable future, aviation will be dependent on fossil fuels, combustion of which generates emissions that impact the environment.
Air Botnia's progress: In recent years Botnia has seen a sharp increase in production, which, in turn, has resulted in increased fuel consumption.

Subsidiary & Affiliated Airlines

Emissions into the air – flight operations, Air Botnia



Background: Flight operations' carbon dioxide emissions are calculated on the basis of fuel consumption. 3.15 kg carbon dioxide is formed per kg fuel burned.
Air Botnia's progress: For Air Botnia it is crucial to reduce fuel consumption for environmental and economic reasons alike. Emissions of CO_2 are directly proportionate to fuel consumption. During 2001 total fuel consumption rose as a consequence of increased production, thereby also increasing CO_2 emissions.

Airline Related Businesses

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This is Airline Related Businesses

Airline Related Businesses includes SAS Cargo, SMART, SAS Trading and Jetpak – all of which make most of their sales to external customers. SAS Flight Academy and SAS Flight Support sell services to both internal and external airlines. Scandinavian IT Group has most of its sales within the Group.

Internetlänkar

- SAS Cargo
- SMART
- Scandinavian IT Group
- SAS Trading
- Jetpak
- SAS Flight Academy
- SAS Flight Support
- SAS Media

Airline Related Businesses

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Highlights of 2001

- SAS Cargo has begun a project to create a standard for measuring the environmental impact from the transportation of goods by air.
- During the past year SMART reduced its use of copying paper by two-thirds.
- All personnel at SAS Media underwent a two-day long environmental training program.
- In 2001 SAS Media's processing of advertisements was digitalized.

Airline Related Businesses

Key performance indicators

	2000	**2001**
Operating revenue, MSEK	5,788	**8,148**
Operating income, EBIT	162	**149**
Income before tax, MSEK	180	**160**
Investments, MSEK	381	**542**
Average number of employees	2,540	**4,038**
Percentage of employees with environmental training, SAS Media, %	NA	**83**
Average number of readers per Scanorama, SAS Media	21	**22**

Airline Related Businesses

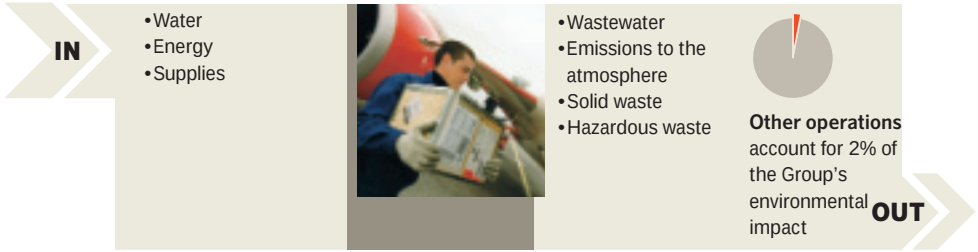
In and out

Below is an overview of Airline Related Businesses' main environmental impact and how it arises. Airline Related Businesses account for 2% of the Group's environmental impact.

The various companies within Airline Related Business consume energy for heating and electricity. Energy comsumption in turn gives rise to a global environmental impact in the form of climate changes and contributes locally to eutrophication and acidification of the soil and water when it is produced by nonrenewal sources.

The diagram shows other important input factors and their environmental impact.

Other operations



Airline Related Businesses

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This is SAS Cargo

On June 1 SAS Cargo was established as an independent limited company, SAS Cargo A/S, wholly owned by the SAS Group.

SAS Cargo's traffic income for 2001 was MSEK 2,170 (2,225). Total flown tonnage was 263,431 (286,785) tonnes. The company's performance in 2001 must be viewed in light of the tragic events of September 11 in the U.S. and the subsequent crisis in the international airline industry in an already weak market.

Through continuous improvements, SAS Cargo aims to ensure that customers, suppliers and the world at large regard SAS Cargo as the leading eco-friendly air-freight carrier.

A huge environmental advance was made in 2000 and 2001 when all major air-freight terminals in Scandinavia and North America were quality certified according to ISO 9002. This effort will serve as a platform for improving the management system to also include environmental management according to ISO 14001.

At the end of 2001 a project was initiated for creating a model and standards for environmental impact of airfreight transport, a project initiated by one of SAS Cargo's key customers.

Links

- SAS Cargo

Airline Related Businesses

Key performance indicators

	1999	2000	**2001**
Operating revenue, MSEK	–	–	**2,698**
Traffic income, MSEK	2,109	2,225	**2,170**
Flown tonnes	284,675	286,785	**263,431**
Tonne-kilometers (thousands)	900,958	944,342	**878,364**
Cargo yield, SEK/tonne-kilometers	2.28	2.33	**2.44**
Number of employees	1,176	1,184	**1,180**

SAS Cargo was formed as an independent limited company on June 1, 2001. Figures for previous periods relate to the operations SAS Cargo conducted within SAS Airline's previously stated SAS flight operations.

Airline Related Businesses

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This is Jetpak

Jetpak, a Nordic leader in “same-day” logistics, is operated by Jetpak Nordic AB, a wholly owned subsidiary of the SAS Group. Jetpak is also represented in the Nordic region by wholly owned subsidiaries, including the largest messenger-service company in the Nordic region: AdenoPicko’s.

Jetpak’s core business is to offer the Nordic transport market time-guaranteed door-to-door express deliveries, local messenger services and tailor-made service logistics solutions. Jetpak is one of the fastest growing players in express logistics in the Nordic region, represented in more than 150 locations with over 800 messenger-service cars.

Jetpak has a partner agreement with all airlines operating within and between the Nordic countries, and collaborates with the express delivery company DHL on deliveries to more than 220 countries.

Key performance indicators

	1999	2000	**2001**
Operating revenue, MSEK	222	244	**355**
varav extern (%)	97.1	97.4	**99.5**
EBITDA, MSEK	18	20	**19**
Operating income, EBIT, MSEK	14	16	**10**
Income before tax, MSEK	16	17	**10**
Number of employees	76	83	**125**

Links

- Jetpak
- DHL
- AdenaPicko’s

Airline Related Businesses

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This is Scandinavian IT Group

Wholly owned by the SAS Group, Scandinavian IT Group is one of the larger IT operations in Scandinavia. The portfolio of operations includes everything from state-of-the-art IT applications to the market's best infrastructure solutions and consulting services. The high expertise required in the airline industry makes Scandinavian IT Group an expert partner for many airlines.

The SAS Group is Scandinavian IT Group's biggest customer. One of its main strategies is to increase its share of customers outside the SAS Group. The aim is to provide the airline industry with the best IT solutions and new product concepts inside and outside the aviation business.

Scandinavian IT Group currently provides approx. 40 airlines with products and services, including members of the Star Alliance.

Key performance indicators

	1999	2000	**2001**
Operating revenue, MSEK	2,247	2,121	**2,463**
of which externally (%)	7.3	4.3	**3.6**
EBITDA, MSEK	222	207	**245**
Operating income, EBIT, MSEK	90	74	**104**
Income before tax, MSEK	82	61	**96**
Number of employees	1,143	1,182	**1,274**

Links

- Scandinavian IT Group

Airline Related Businesses

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This is SAS Trading

SAS Trading is an independent business unit within the SAS Group and a world-leading travel retail operator with 55 outlets at 34 airports in Sweden, Norway, Denmark, Estonia, Latvia and Poland. Its business concept is “to purchase, market and sell high-profile brand-name merchandise at a discount to frequent air travelers in its own stores.”

With 658 employees, SAS Trading had MSEK 2,275 in operating revenue this year. The shops at airports are operated under so-called licence agreements, i.e. the operator offers the airport owner to operate the shops for a certain number of years with rent as the value factor. After the contract period expires the shop space goes to a new bidding round.

This year SAS Trading submitted bids for tax-free shops in Copenhagen and Sweden. In both cases the licenses went to a competitor.

Key performance indicators

	1999	2000	**2001**
Operating revenue, MSEK	2,188	2,148	**2,275**
of which external (%)	99.9	99.0	**98.0**
EBITDA, MSEK	49	97	**38**
Operating income, EBIT, MSEK	21	64	**2**
Income before tax, MSEK	38	75	**–1**
Number of employees	590	639	**658**

Links

- SAS Trading

Airline Related Businesses

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This is SAS Flight Academy

SAS Flight Academy is a wholly owned subsidiary of the SAS Group, operating leading training centers for pilots, cabin crew, flight technicians and ship's officers. The company is ISO 9001 certified and approved by civil aviation authorities for pilot training according to European JAR-FCL regulations.

Besides SAS, SAS Flight Academy trains customers from approx. 150 different airlines and military organizations. The main operations are conducted at Arlanda Airport as well as through subsidiaries in Denmark and Norway.

To further enhance SAS Flight Academy's position as a leading European training center, it installed a deHavilland Q400 flight simulator in March 2001 and an Airbus A330/A340 flight simulator in June 2001.

Key performance indicators

	1999	2000	**2001**
Operating revenue, MSEK	607	606	**627**
of which external (%)	32.6	37.6	**35.4**
EBITDA, MSEK	184	176	**150**
Operating income, EBIT, MSEK	108	98	**62**
Income before tax, MSEK	103	92	**56**
Number of employees	189	193	**200**

Links

- SAS Flight Academy
- JAA

Airline Related Businesses

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This is SMART

Scandinavian Multi Access Systems SMART AB (SMART) is owned 95% by the SAS Group and 5% by Amadeus Global Distribution S.A.

SMART is Northern Europe's leading company in the electronic sale and distribution of tickets and travel-related services, handling approx. SEK 70 billion in electronic travel transactions a year. With three business areas and offices in Copenhagen, Oslo, Stockholm, Riga and Vilnius, the company had at year-end 249 employees.

SMART has an environmental program tailored to the fact that the company conducts office operations. Its aim is to utilize natural resources as carefully as possible, with a minimal environmental impact. Waste is sorted at the source into five fractions for recycling. Whenever possible, only eco-labeled products are purchased. The cleaning firm SMART employs uses eco-friendly cleaning materials. Over the past three years SMART has reduced its use of copying paper by two thirds.

Key performance indicators

	1999	2000	**2001**
Operating revenue, MSEK	683	584	**593**
of which external (%)	98.4	99.0	**99.8**
EBITDA, MSEK	55	–5	**71**
Operating income, EBIT, MSEK	33	–20	**62**
Income before tax, MSEK	37	4	**95**
Number of employees	351	294	**249**

Links

- SMART

Airline Related Businesses

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This is SAS Media

With 45 employees in its offices in Oslo and Stockholm, SAS Media is 100% owned by the SAS Group.

The company publishes SAS Airline inflight periodicals Scanorama and SAS Magazine in Denmark, Norway and Sweden. Production is financed through advertising revenues from advetisers interested in reaching the target group “onboard” under the slogan: Meet the Scandinavians. Advertisers can also communicate with the target group through other channels in the SAS Group also sold by SAS Media.

In the next few years SAS Media will increase its commitment to the digital media world. Database technology makes it possible to publish in a variety of channels, for example Internet, WAP, inflight video screens and printed publications. The aim of this commitment is to collaborate with other units of the SAS Group for cost-effective production of information, entertainment and market communication.

The company had MSEK 63 in operating revenue in 2001, with a pre-tax income of MSEK 6.

Links

- SAS Media

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SAS Media and the enviroment

SAS Media's environmental impact is largely indirect. The direct environmental impact is associated with the consumption of energy and resources at offices, waste generation and transportation.

Since 1998 SAS Media has followed an environmental program based on TCO's environmental management system 6E, which covers both the external environment and working environment. Environmental and human resource goals are integrated into SAS Media's business plan.

Sorting routines for waste have been established at the Stockholm office. Waste is sorted into the fractions: cardboard, paper, glass, cups, toner cassettes and hazardous waste. Old furniture is auctioned off to employees or donated to charity. The Stockholm office has been renovated with a new kitchen designed for waste sorting.

A company car policy has been established whereby all company cars shall be disposed of gradually. As a first step in setting environmental requirements for all suppliers, SAS Media has started examining suppliers of repro and printing services. For this SAS Media has enlisted the aid of SAS's purchasing department. Minimizing paper consumption is key. During the year, SAS Media created a web-based price list, reducing the number of printed copies from 5,000 to 3,000.

In 2001 all advertising has become 99% digital.

Events 2001

The environmental work conducted so far at the Stockholm office will be enhanced, in that an environmental coordinator has been appointed to the Oslo

Links

- TCO

Airline Related Businesses

office as of 2002. All personnel have taken a one-day course in natural environment issues and a one-day course in working environment issues.

SAS Media has an environmental policy stemming from SAS's overall sustainability and environmental policy, which reads as follows : "Everyone at SAS Media shall work continually to achieve long-term, permanent improvements in the external and working environments".

The environmental policy shall lead to the goal that SAS Media shall minimize its impact on the external environment and economize on ressources; that SAS Media shall be a pleasant and attractive workplace; that environmental goals and environmental measures shall be coordinated and harmonized with general production, quality and financial goals; and that environmental aspects shall be incorporated into daily work and that managers shall be good role models.

Goals and plans for 2002

In 2002 SAS Media will intensify its work in setting environmental requirements for suppliers. Inquiries will be dispatched to all suppliers.

- At the offices, the use of paper shall be measured in order to minimize paper consumption in the long term.
- A personnel handbook will be created and preferably published exclusively in electronic form.
- All new employees will receive instructions on policies regarding both the natural and working environments.
- SAS Media has environmental information at its website.

Links

- SAS Media

Rezidor SAS Hospitality

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This is Rezidor SAS Hospitality

Rezidor SAS Hospitality comprises the SAS Group's hotel operations. Rezidor SAS is currently operating two hotel chains, Radisson SAS Hotels & Resorts and Malmaison. The company has adopted a new strategic focus since 2001, which envisions worldwide hotel management operations under several brands. At the end of 2001 Rezidor SAS Hospitality had operations in 38 countries. Radisson SAS operated 152 and Malmaison operated eight hotels. Rezidor SAS owned only two hotel facilities at the end of the year.

In 2001 Rezidor SAS Hospitality reported operating revenue of MSEK 3,510 (3,122), and the company had 35,000 (32,000) rooms and 12,000 (12,000) employees. Income before taxes was MSEK 208 (583).

REVPAR (Revenue Per Available Room) is an important key financial performance indicator for the hotel business. Rezidor SAS had a REVPAR of SEK 638 (619) per guest night.

Overall goals

Rezidor SAS Hospitality aims to be one of Europe's leading hospitality management businesses – with a portfolio of strong brands, focused on different market segments with corresponding high-performing products.

Links

- Rezidor SAS Hospitality
- Radisson SAS Hotels & Resorts
- Malmaison

Rezidor SAS Hospitality

Scope of the environmental report

The information disclosed below applies only to Radisson SAS, which is the dominant company in Rezidor SAS, with a total of 152 hotels. Malmaison, which was acquired in 2000, is subject to the same responsible business policy and program as Radisson SAS, but it has not come as far in introducing the program. Next year Malmaison will also report on how it complies with the Responsible Business Program.

Radisson SAS Hotels & Resorts

Radisson SAS operates 152 hotels, 33 of which are operated on a franchise basis. The company had 11,700 full-time equivalent employees in 2001. The occupancy rate was 67% (69%). Radisson SAS had a total of 33,700 rooms available in 2001.

Since the number of hotels reporting data varies from year to year the numbers for Radisson SAS are not always comparable.

The following pages contain diagrams showing environmental data and a description of the changes over a three-year period, both in absolute and relative figures. The diagram describes the operations at Radisson SAS Hotels & Resorts, the largest of the two hotel chains within Rezidor SAS Hospitality.

Links

- Map showing hotels

Rezidor SAS Hospitality

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Highlights of 2001

- Radisson SAS expanded during the year with 13 new hotels for a total of 152.
- A new position titled Director Environmental & Social Affairs was established in April 2001.
- A comprehensive responsible business policy was adopted.
- Environmental and responsible business coordinators were appointed at each hotel.
- A corporate responsibility handbook was prepared and an extensive training program was introduced.

Rezidor SAS Hospitality

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“We have taken a very big first step”

Environmental issues have been on the agenda of Radisson SAS for a long time. The first environmental policy was adopted as early as 1989. In the middle of the 1990s an action plan was established for all the hotels. It was implemented by close to 90 percent of the hotels. Radisson SAS has in other words a long environmental history compared to the hotel industry in general, but we have to date not reported to the public so much about what we have done.

We had therefore a good foundation to stand on when it was time to take the next step. This was when we launched an effort at the end of the 1990s to broaden our environmental commitment so that it would cover all aspects of the concept of sustainable development. As a result of the changing value patterns, companies started to demand that companies also work with ethical and social issues, in addition to environmental considerations.

Travelers from Scandinavia and Northern Europe also expect a hotel chain that is so closely associated with Scandinavia to live up to several important fundamental values. These include respect for the equality of all people, good health, environmental protection and nature conservation.

In 2001 we were ready to introduce our Responsible Business Program. For the first time we are making a strategic and structured move to work with issues that concern sustainable development. As a result of this program we have prepared a handbook for responsible business for all the hotels; appointed coordinators at

Rezidor SAS Hospitality

every hotel, who are to function as supporters for the hotel managers; in addition to launching a training program for responsible business. Last year we took our first step towards a more systematic effort to ensure that all the hotel chains in SAS Rezidor contribute to sustainable development.

During the next five years we have decided to devote ourselves to a number of important issues. These include for example the establishment of routines to ensure that we purchase eco-compliant products, and that these products are purchased from suppliers who have responsible conduct with respect to the natural and working environment. We will also reduce our dependency on non-renewable natural resources through, for example, increasing the efficiency of our hotel operations, and then we will continue to train our personnel so that they can see that they can make a positive contribution to the hotel's social and environmental performance through their actions.

Brussels, February 2002

Pia Heidenmark
Director, Environmental & Social Affairs

Read also

- President's statement
- Environmental Director, SAS Airline

Rezidor SAS Hospitality

Key performance indicators

Environmental performance indicators Rezidor SAS Hospitality

	1999	2000	**2001**
Water consumption, 1,000 m^3	2,460	2,822	**2,462**
Water (liters/guest night)	634	611	**475**
Energy consumption, GWh	390	409	**392**
Energy, kWh/m^2	346	311	**303**
Carbon dioxide (CO_2) emissions, 1,000 tonnes	7.2	6.0	**6.1**
Unsorted waste, 1,000 tonnes	NA	NA	**12**
Repeat-purchase rate, %	94	94	**88**
Occupancy rate, %	69	69	**67**
Number of rooms occupied, 1,000	4,506	4,876	**4,964**
Operating revenue, MSEK	2,963	3,122	**3,510**

The world around us

The travel and tourism industry is increasingly influenced by the world situation. Political conflicts, social unrest and environmental problems have a major impact on hotel operations. All these things result in less travel, as was clearly demonstrated after September 11.

The hotel industry is also influenced by fluctuations in energy and water prices, as well as waste management costs. The price of energy, oil prices in particular, fluctuates too, depending on the political situation.

The hotel and travel industry can have a positive effect on society through facilitating the preservation of local traditions and supporting the preservation of cultural heritage and the natural environment. The interest in preserving these resources increases in general when tourists start to visit a region. Uncontrolled growth in tourism without any respect for culture and the natural environment can, however, deplete the resources that the industry is dependent on for its long-term survival. The ecological footprint of too many people, who all use electricity and water, and generate waste, can also be too much for a community. Overexploitation can diminish the travelers' personal experience of a place, in addition to harming its cultural and environmental heritage. This has already occurred at several locations in the world.

It is therefore important to the long-term survival of the hotel industry that joint industry-wide agreements and strategies are established. Radisson SAS is a mem-

Links

- IHEI
- CERES

Rezidor SAS Hospitality

ber of the International Hotels Environment Initiative (IHEI), which is the hotel industry's joint body for these types of issues. Other initiatives in the industry include the UN and CERES Tour Operators Initiative, in which guidelines for what tour operators can require from hotels have been prepared, in addition to CERES guidelines for key performance indicators for the hotel industry in order to facilitate reporting. To encourage hotels to make continuous improvements, the International Hotel and Restaurant Association (IH&RA), awards an annual prize to hotels that have excelled in the environmental area.

Increased environmental awareness

Environmental awareness is increasing, and it is often proportionate to improvements in prosperity, the economy and the level of education. Travelers often take their habits and fundamental values with them when they travel. They expect therefore that the hotels where they stay treat their employees and the environment properly.

Therefore the hotel industry is experiencing greater pressure to report on its performance with respect to the environment and social responsibility. The importance of this is also stressed in recommendations from the European Commission. These recommendations provide guidance for how the quality, clarity and comparability of environmental data from European companies can be improved. (EU Recommendation IP/01/814).

In many countries, issues concerning safety, the environment and social responsibility are still quite new. Investing in the environment and social responsibility can

Links

- IH&RA

Rezidor SAS Hospitality

give the hotel and travel industry a competitive advantage in these countries. In other markets, such as the Northern European and Scandinavian markets, environmental issues and corporate responsibility have become a critical factor for success. In Scandinavia there is an environmental labeling program for lodging services. The official Nordic Swan label program has published environmental criteria. Some of the Radisson SAS hotels in Scandinavia have introduced activities that are recommended by the Swan program, but none of the hotels have at present decided to seek Swan certification.

Many customers, especially major corporations, are also stipulating more explicit environmental requirements in relation to their suppliers of travel and lodging services, and even social responsibility requirements to some extent. Radisson SAS has received customer requirements from a couple of major Scandinavian and German corporations, in addition to a few conference organizers. One of the major corporations requested the disclosure of the hotel's carbon dioxide emissions in order to calculate their own employees' contribution to the greenhouse effect.

Many of Radisson SAS's competitors, primarily in the Scandinavian market, are working on environmental programs, and several of them have even started to take a broader view of their social responsibility. In general, however, the hotel industry is still in the initial phases of active and structured environmental work. This is because the customer requirements have not been noticeable until the last few years.

Links

- Nordic Swan

Environmental management report

Radisson SAS's environmental impact is primarily associated with energy, water consumption and waste generation. More efficient utilization of these resources represents at the same time an opportunity to reduce our negative environmental impact. The use of materials and chemicals also have a significant impact on the environment. Selecting eco-compliant products is therefore the best way the hotels can reduce the indirect environmental impact associated with the use of goods and services.

The consumption of energy, provided it is not based on renewable sources, contributes to global climate change. Locally this entails primarily the emission of sulfur and nitrogen oxides, which are acidic and cause eutrophication. The consumption of water is primarily a resource problem. There is a shortage of water in most parts of the world. As a hotel chain, Radisson SAS uses large volumes of products, which are associated with varying degrees of negative environmental impact. With regard to the handling of chemicals, overdosing and inefficient application can increase the hotels' contribution to eutrophication and other water pollution.

Water

Since the number of guests has a significant impact on the volume of water that is consumed, the key performance indicator for water is based on the number of guest nights. With 1999 as the base year, water consumption per guest night has declined 22%, from 611 to 475 liters per guest night in 2001.

Bookmarks in article

Rezidor SAS Hospitality

The Responsible Business Program includes instructions for how the hotels can conserve water. 70% of Radisson SAS's hotels have installed some type of water saving device, such as low-flush toilets and low-flow showerheads. Some hotels have also installed a system that recycles gray water, in which water from the showers is used in the toilets.

Energy

The energy costs represent a significant portion of the hotels' operating expenses. In order to facilitate comparison, the energy consumption is measured in KWh per square meter, excluding garages and similar space. From 2000 to 2001 the relative consumption of energy fell by 2.6% to 303 (311) kWh/m^2.

Radisson SAS started as early as 1993 to work actively on energy conservation. From 1993 to 1999 we were successful in reducing the consumption of energy by 6.2 GWh. The total carbon dioxide emissions in 2001 amounted to 6,126 tonnes.

Our goal in the energy area is to increase the share of renewable sources and to be more energy efficient. In 2001 25% of the electricity supplied to hotels was generated from renewable sources, primarily hydroelectric or wind power, as well as biomass. To increase energy efficiency the hotels have adopted a number of different measures, which include the installation of energy saving devices such as low energy lighting, energy conserving minibars and motion-controlled lighting.

Materials

Hotels consume a large volume of purchased materials daily. Chemicals comprise a prior-

Bookmarks in article

Rezidor SAS Hospitality

ity group of materials that Radisson SAS will be working on in the coming years. Laundry detergents and cleaning agents represent the largest volume of chemicals that are used in hotels.

In 2001 a total of 247 tonnes of laundry detergent and cleaning agents were used. This corresponds to 51 grams of cleaning materials per guest night for all of Radisson SAS. This is the first time that the hotels have been requested to report this information to the head office, so there is some uncertainty concerning the reliability of the data supplied.

One of the best ways of reducing the consumption of chemicals is to install automatic dosing devices in order to reduce the risk of overdosage to a minimum. 80% of the Radisson SAS hotels have implemented dosage systems for laundry detergent and 50% have done so for cleaning agents.

Waste

In 2001 the volume of unsorted waste generated by the hotels was approximately 11,791 tonnes. It should be noted, however, that only 64 hotels have been able to report unsorted waste. In many instances it has been difficult for the hotels to obtain the data from the local garbage collector concerning the volume of waste collected.

80% of the hotels recycle glass and 50% recycle aluminum. 80% of the Radisson SAS hotels make sure that paper is recycled and batteries are collected for proper disposal. More than 50% of the hotels collect and sort waste into as many as nine different categories, which are: paper, glass, batteries, aluminum cans, cardboard, metal, plastic, organic waste and toner cartridges.

A total of 3.1 (3.4) kg of unsorted waste is generated per guest night. There is, howev-

Bookmarks in article

Rezidor SAS Hospitality

er, a great deal of variation between the hotels in the various regions. In Scandinavia, for example, no more than 1.4 kg of unsorted waste is generated per guest night. The differences are attributed primarily to how well-developed the infrastructure for the collection of waste is in the country in question.

Environmental management and organization

A Director, Environmental & Social Affairs, who is also responsible for social issues, was appointed in the spring of 2001. The director reports to the president of Rezidor SAS.

Radisson SAS has come the furthest in terms of the organization of environmental activities. The environmental organization was reinforced during the year; coordinators were appointed at each hotel and regional coordinators were even appointed in the largest regions.

Ethics and social issues

A Responsible Business Program was developed in 2001. This applies to all of Rezidor SAS Hospitality. During the first year, most of the focus was, however, on Radisson SAS, which represents the greatest part by far of Rezidor. General as well as specific environmental targets were defined, and key performance indicators covering both the social and environmental aspects were linked to these targets. In 2001 the program was introduced in all of the regions, and hotel managers as well as coordinators were given comprehensive information on the program and how it affects them.

Radisson SAS prepared a responsible business handbook during the year. It will be distributed early in 2002, and an extensive training program will be introduced at the same time.

Bookmarks in article

Rezidor SAS Hospitality

Environmental permits

Hotel operations are not subject to any special environmental permits. If there are restaurant operations at the hotels, then they comply with the local health, hygiene and food regulations.

Accidents and incidents

After several cases of Legionnaire's disease in the summer of 2001, some of which were fatal, the bacteria were traced to the ventilation and air conditioning system at the Radisson SAS Hotel Atlantic in Stavanger. The hotel has followed all of the appropriate regulations and maintenance routines. To date, the hotel has not been charged by the local authorities, fined or taken to court. In a press release, Radisson SAS has made clear its intent to take responsibility, if it is proved that the hotel is liable for the incident.

Infringements

All Radisson SAS hotels were, with one exception, in compliance with all the applicable regulations in 2001.

The Radisson SAS hotel in Düsseldorf has been informed by the health and safety authorities that the hotel was not in compliance with the city's new tightened building and fire safety regulations. Earlier inspections and safety audits did not uncover any safety regulation infractions at the hotel. The city of Düsseldorf has, however, tightened its regulations as a result of the fire at the airport a couple of years ago. Radisson SAS has launched a project to bring the hotel in compliance with the new requirements. The investments required to realize this project are estimated to cost MDEM 15.

Bookmarks in article

Rezidor SAS Hospitality

Permits, infringements, incidents and disputes

None of the Radisson SAS hotels were involved in any environmentally related disputes in 2001.

Profile and image

Early in 2002 Radisson SAS organized a change collection campaign in cooperation with Save the Children. This took place in connection with the changeover to the euro in several European countries, when a number of currencies ceased to exist.

Radisson SAS has supported selected preservation projects within the framework of the UNESCO Cultural Heritage Program for several years. In 2001 we supported the restoration of an antique tapestry in the Polish city of Krakow. The tapestry is the oldest and most valuable tapestry in Poland's 15th century collection.

Bookmarks in article

- Water
- Energy
- Materials
- Waste
- Environmental management and organization
- Ethics and social issues
- Accidents and incidents
- Infringements
- Permits, infringements, incidents and disputes
- Profile and image

Read also

- Environmental management report, SAS Group
- Environmental management report, SAS Airline

Links

- UNESCO

Rezidor SAS Hospitality

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Organization and process

Environmental activities at Radisson SAS Hotels & Resorts are integrated into the Responsible Business Program that was adopted in 2001. The program covers the aspects of sustainable development that have been assessed as the most significant to the hotel industry, i.e. the natural environment, human rights, health and safety, business ethics and risk prevention. The Responsible Business Program has been developed and approved by the management of Radisson SAS and its parent company Rezidor SAS Hospitality.

The Responsible Business Program was established after the identification of seven key stakeholders. These are: employees, customers, property owners and investors, suppliers, community, government and the legislative authorities, as well as the natural environment.

- Take responsibility for the health and safety of employees and customers.
- Show responsibility for social and ethical issues in the company, as well as the local and global community.
- Reduce our impact on the natural environment.

Foundation of our environmental activities

The program is based on general goals and detailed targets, with specific key performance indicators, in order to evaluate whether the individual hotel, as well as the chain as a whole, is continuously improving its performance.

Hotel operations are basically the same throughout the world in spite of the exis-

Rezidor SAS Hospitality

tence of certain regional differences. Radisson SAS has therefore conducted a comprehensive review of the environmental aspects, which has been presented to all of the hotels. Based on this analysis, the hotels are encouraged to study the areas that are of particular significance to their operations.

The goals and strategy for the Responsible Business Program are established by the Director, Environmental & Social Affairs, together with the management team for Rezidor SAS Hospitality. This is done on an annual basis, and the intention is to increase the number of target areas as the hotels become more used to working with the Responsible Business Program.

Due to the fact that only general goals and key performance indicators for these goals have been defined, the program will vary according to the individual prerequisites of the hotels. The hotels choose for themselves what activities they will carry out in order to improve their performance and fulfill their goals. To assist in these efforts, the hotels have a corporate responsibility handbook that has been approved by the Rezidor SAS management, which includes a list of suggested activities. The hotels establish their own action program based on this.

Environmental organization

The Director, Environmental & Social Affairs, is affiliated with the head office and reports directly to the president and the rest of the company management. The Director, Environmental & Social Affairs, coordinates all the environmental work and other activities that are associated with the Responsible Business Program at the

Rezidor SAS Hospitality

hotels. The Environmental Director is employed by the parent company Rezidor SAS Hospitality and is also responsible for the environmental activities of Malmaison. Radisson SAS, which is the dominant unit in Rezidor and had already established environmental activities, was the first to introduce the new program.

There is a local coordinator at each hotel that supports the hotel manager with regard to work with environmental and social issues at the individual hotels. The larger regions, i.e. the regions where Radisson SAS has a large number of hotels, also have regional coordinators for the Responsible Business Program, who function as a liaison between the head office and the region.

The Responsible Business Program is a line responsibility. Thus it is the hotel and department managers who are responsible for ensuring that the program is implemented in the respective hotels and departments. The role of the coordinators is to support the line managers in this work and to report the progress made and performance data to the head office.

Reporting and follow-up

The hotels report their progress annually in the areas that are covered by the program, and certain key environmental performance data such as energy, water and waste will be reported to the head office monthly from January 2002. The monthly reporting is linked to the ordinary financial reporting system.

The hotels' performance will be followed up based on these reports quarterly with regard to the most important environmental aspects, and annually for the entire

Rezidor SAS Hospitality

program. A selection of the hotels will also receive a visit from the head office, during which the hotel's corporate responsibility efforts will be reviewed and the hotel will be able to explain how, where and who has carried out and is responsible for the various activities.

Information and training

Radisson SAS prepared a Responsible Business Program handbook during the year. It will be distributed early in 2002, and an extensive training program will be introduced at the same time. In 2001 and no later than first part of 2002 all of the hotel managers and Responsible Business Program coordinators will have received information on the program and its implications for the hotel.

The hotels' coordinators will have also completed the basic training program during this period. They are to conduct training by department together with the training supervisor at the hotels. The training will start with the department managers and subsequently be given to all the employees.

The Responsible Business Program training will be within the framework of the ordinary training budget. No date has been set for the completion of the training, which means that some of the regions will have completed most of the training in 2002, while others will just be starting to train the department managers in 2002 and conduct most of the training next year.

Bookmarks in article

Rezidor SAS Hospitality

Subcontractors and other external contacts

For products where Radisson SAS is a high volume consumer and the environmental impact is significant, there will be strict environmental requirements in place for both the product and the supplier. Our work to establish structured environmental requirements is still in its infancy, and centralized purchasing has been in focus in 2001. In some cases the supplier has only been informed about Radisson SAS's environmental requirements, in other cases the environmental performance has been of decisive importance.

A large share of the products that are purchased is based on central purchasing agreements, but there are still many products that are purchased at the local level. In 2002 more general purchasing requirements will be defined to support the hotels in the local and regional purchasing that takes place. These requirements are related to having an environmental policy and action plan. Radisson SAS also plans to define specific environmental requirements for the most important product groups.

The environmental work related to purchasing that has primarily taken place at the hotel level concerns purchasing in large volume, avoiding disposable products, actively seeking eco-compliant alternatives and stipulating environmental packaging requirements. The most common eco-labeled products that are purchased by the hotels are cleaning agents, as well as office and toilet paper. Approximately 70%

Bookmarks in article

Links

- IHEI

Rezidor SAS Hospitality

of the hotels purchase eco-compliant alternatives for these product groups.

With regard to the construction and renovation of hotels, Radisson SAS has prepared a list of chemicals that may not be used and a list of chemicals that are to be discontinued. The contractors are requested to work according to this list.

Collaboration

Radisson SAS cooperates with other hotels within the framework of the so-called Prince of Wales Business Leaders Forum – International Hotels Environmental Initiative. This is a forum where the various hotel chains meet to discuss industry specific questions that are related to the environment and responsible business.

Rezidor SAS Hospitality also participates in an environmental network that is currently being developed within the SAS Group, where ideas and experience are exchanged between the various business units.

Environmental profiling and sponsorship

An involvement in the community is an important part of the Responsible Business Program. While the individual hotels are responsible for involvement at the local level, the Radisson SAS head office is responsible for more general projects. We actively support for example selected preservation projects within the framework of UNESCO's Cultural Heritage Program.

There are several different sponsorship projects at the hotel level, and 76% of the hotels organize one or more charity events annually. For example, 22% of the hotels

Bookmarks in article

Links

- UNESCO
- Red Cross
- Save the Children
- Terry Fox Run

Rezidor SAS Hospitality

organize collection projects in the form of international events such as the Terry Fox Run and Kids to Kids, where the money that is collected goes to children in need. Other examples are donating used furniture, blankets, food, etc, to the homeless, orphanages, the Red Cross or Save the Children. Some hotels organize cleanup days when the hotel's personnel clean up rubbish from beaches and the environment.

Health and safety

To ensure a healthy and safe working environment for the employees and the guests, Radisson SAS introduced a rigorous health and safety program several years ago. The standard is based on four pillars: fire safety, guest safety, employee safety and operational safety. If the internal standard is higher than the local rules and regulations, then the internal standard shall be followed. All Radisson SAS hotels shall conduct an internal safety audit every year in order to follow up safety work.

Vision, policy, goals and strategies

Vision

Radisson SAS Hotels & Resorts shall play a leading role with regard to corporate responsibility in the international hotel industry, receive full recognition for our position and benefit from the resulting growth in value.

Bookmarks in article

Rezidor SAS Hospitality

Responsible business policy

- We shall educate and facilitate our employees to make a conscious decision in favor of environmental and social issues in their private and business lives.
- We shall inform and make it easy for our guests to participate in Responsible Business Program related activities at our hotels.
- We shall work together with investors and property owners to find innovative solutions that satisfy our economic, environmental and social objectives.
- We shall strive to purchase products that have a reduced environmental impact during their lifecycle, from suppliers that demonstrate environmental and social responsibility.
- We shall take an active role in the international responsible business community, and contribute to the local communities where we operate.
- We require our hotel managers to abide by local and international legislation, regarding labor, health and safety, human rights and the environment.
- We shall do our utmost to ensure that our business is environmentally sustainable, and that we continuously improve our performance in the areas of energy, water, chemicals and resource consumption, and waste generation.

Overall goals

16 overall goals associated with the seven key stakeholders identified have been established. There are 17 specific targets with key performance indicators for these goals. They have been chosen so that it is possible to measure and ensure that a

Bookmarks in article

Read also

- Organization and process, SAS Group

Rezidor SAS Hospitality

continuous improvement is achieved. The overall goals cover both social and environmental issues, and they are grouped around the three areas mentioned:

- Responsibility for the health and safety of employees and customers.
- Responsibility for social and ethical issues in the company, as well as the local and global community.
- Reduction of our impact on the natural environment.

Comments on the goals

- Consumption targets for energy and water, for example, that take into account what region the hotel in question is located in. Radisson SAS operates hotels in 38 countries and the climates can vary greatly. Hotels are compared with other hotels in the same region.
- There are great differences between the countries with regard to waste management and what can be sent to recycling. We measure therefore the volume of unsorted waste. Our goal is to minimize this volume.
- With regard to social responsibility, the initial focus is on involvement in the local community.
- Child labor is another aspect of social responsibility. Radisson SAS will prepare routines and increase awareness so that child labor does not occur at our hotels or at our suppliers.
- The portion of the program that is associated with the health and safety of the employees and guests has been on the agenda for a long time. Now this issue is being stressed further through the definition of specific targets.

Bookmarks in article

Read also

- Organization and process, The SAS Group
- Organization and process, SAS Airline

Rezidor SAS Hospitality

In and Out

Resource use and environmental impact

Below is an overview of Rezidor SAS Hospitality's main environmental impact and how it arises. Hotel operations account for 12% of the Group's total environmental impact.

Rezidor SAS Hospitality annually consumes energy for heating and electricity. Energy consumption in turn gives rise to a global environmental impact in the form of climate charge and contributes locally to eutrophication and acidification of the ground and water if it is produced by nonrenewable sources. Other important input factors and their environmental impact are shown in the diagram.

Hotel operations

IN

- Water
- Energy
- Food and beverages
- Chemicals/ Hazardous materials
- Maintenance materials
- Office supplies
- Disposable items
- Newspapers, brochures

- Wastewater
- Sulfur dioxide (SO_2)
- Carbon dioxide (CO_2)
- Packaging
- Nitrogen oxides (NOx)
- Soot and particles
- Hazardous waste
- Organic waste
- Hydrocarbons (HC)
- Packaging

Hotel operations account for 12% of the Group's environmental impact

OUT

Rezidor SAS Hospitality

Accounts

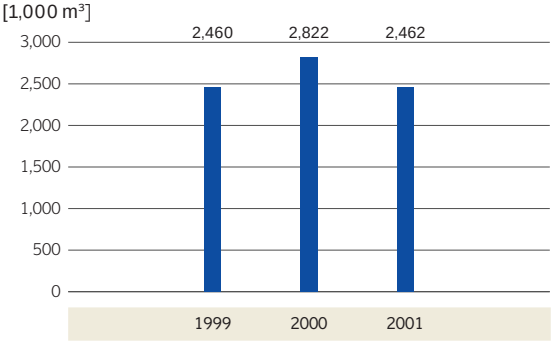
On the following pages are diagrams showing environmental data and a description of the changes that have taken place over a three-year period, both in absolute and relative figures. The diagram describes the operations at Radisson SAS Hotels & Resorts, the largest of the two hotel chains within Rezidor SAS Hospitality.

Bookmarks in article

Rezidor SAS Hospitality

Resource use

Total water consumption



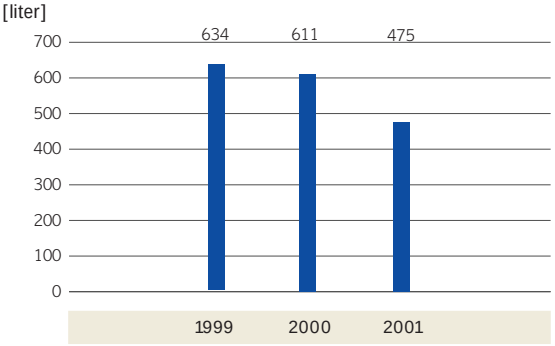
Background: Water consumption varies regionally depending on the climate. At Radisson SAS hotels in the Middle East, a lot of water is consumed in outdoor swimming pools.
Radisson SAS' progress: The data basis varies: 1999: 70 hotels, 2000: 77 hotels, 2001: 74 hotels. Consumption largely follows the variation in the number of hotels reporting.

Bookmarks in article

Rezidor SAS Hospitality

Resource use

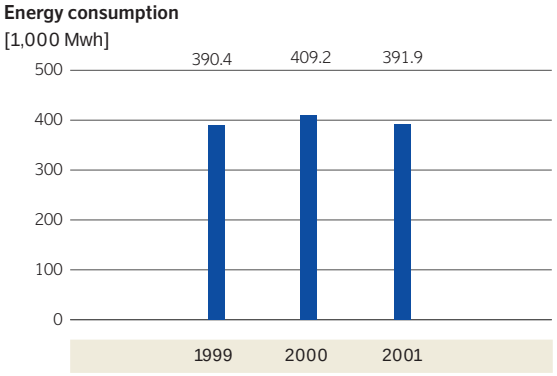
Water consumption per guest night



Radisson SAS progress: Relative water consumption has fallen by 22% from 2000 to 2001.

Rezidor SAS Hospitality

Resource use

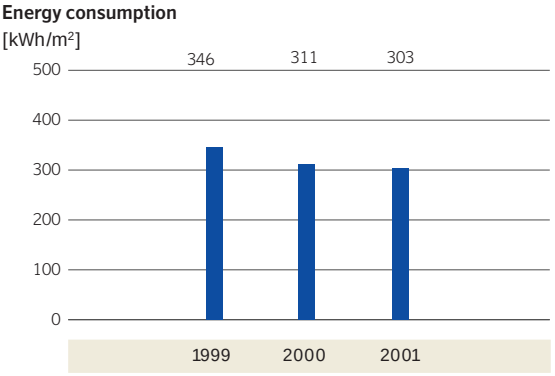


Bakgrund: Radisson SAS's energy mix consists of electricity, district heating/cooling, oil and natural gas.
Radisson SAS progress: Energy consumption has remained rather constant, though the data basis has varied; 1999: 56 hotels, 2000: 73 hotels, 2001: 76 hotels, which explains why the results are not comparable.

Bookmarks in article

Rezidor SAS Hospitality

Resource use



Radisson SAS progress: Relative energy consumption has fallen by 3% from 2000 to 2001.

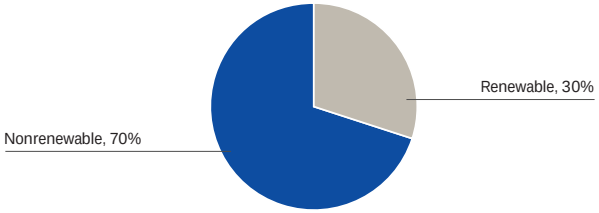
Bookmarks in article

Rezidor SAS Hospitality

Resource use

Energy

Energy source for electric power, renewable /nonrenewable

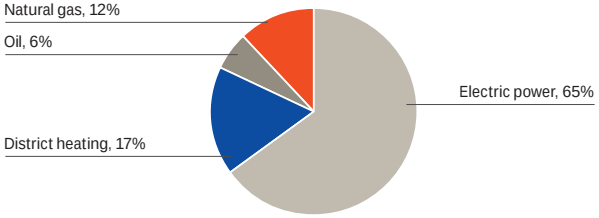


Background: An increased share of renewable energy is one of the points in the Responsible Business Program. Approx. 30% of the hotels' electric power is generated from a renewable energy source (wind power, solar energy, hydroelectric power or biofuels).

Rezidor SAS Hospitality

Resource use

Energy consumption by source

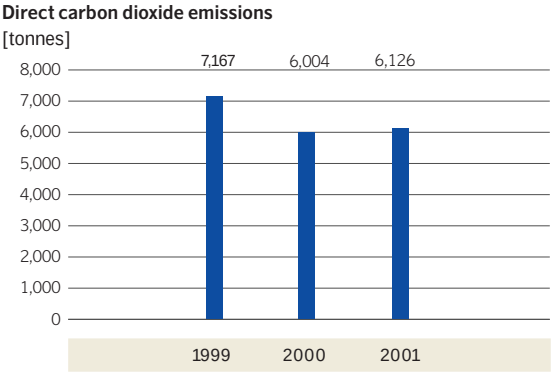


Background: An increased share of renewable energy is one of the points in the Responsible Business Program. Approx. 30% of hotels' electric power is generated from renewable energy sources (wind power, solar energy, hydroelectric power or biofuels).

Bookmarks in article

Rezidor SAS Hospitality

Emissions into the air

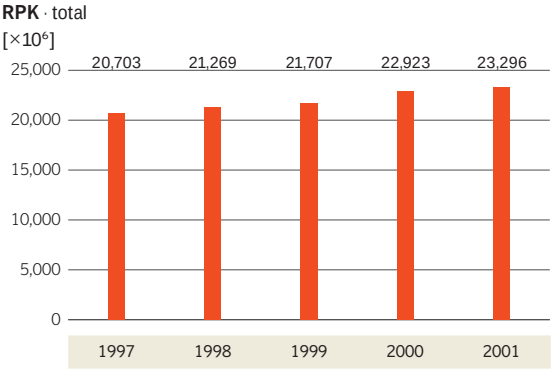


Background: The number of hotels that have reported data has varied over the years, explaining why the total impact is not comparable.
Radisson SAS progress: Carbon dioxide emissions rose by 2% from 2000 to 2001.

Bookmarks in article

SAS Airline

Production

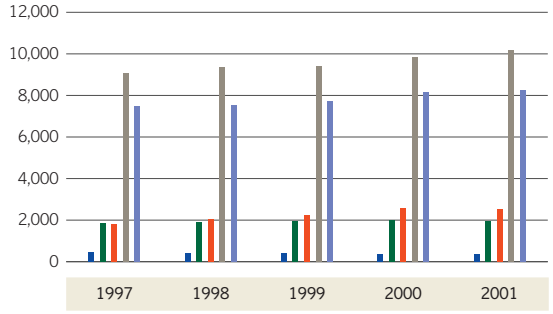


Background: RPK measures passenger capacity sold during the year.
SAS Airline's progress: Despite a sharp market decline at the end of 2001, there was overall a slight rise in production during the year.

SAS Airline

Production

Fuel consumption RPK · By region
[1,000 m³]

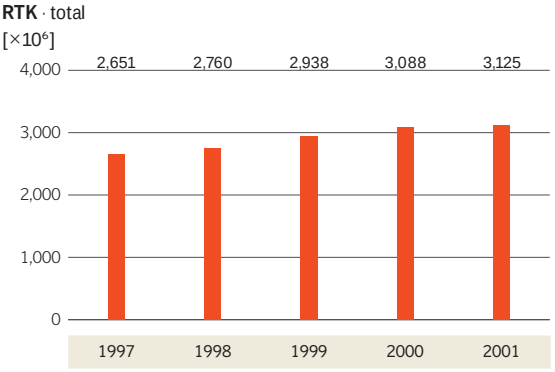


[x10m³]	1997	1998	1999	2000	**2001**
Denmark	471	429	387	379	**372**
Norway	1,832	1,913	1,960	1,978	**1,963**
Sweden	1,819	2,034	2,235	2,574	**2,529**
Europe[1]	9,079	9,357	9,417	9,841	**10,167**
Intercont.	7,502	7,536	7,708	8,150	**8,264**

[1] *Including intra-Scandinavian traffic.*

SAS Airline

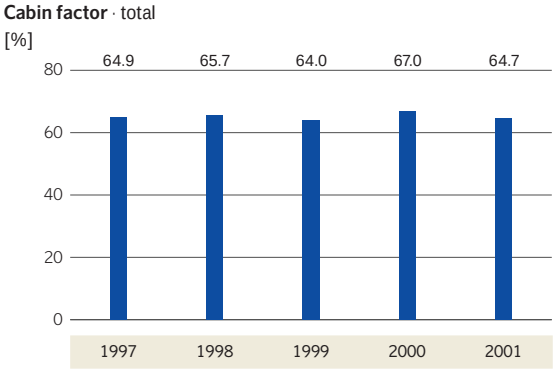
Production



Background: RTK measures passenger and freight capacity sold during the year.
SAS Airline's progress: Despite a sharp market decline at the end of 2001, there was overall a slight rise in production during the year.

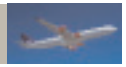
SAS Airline

Cabin factor



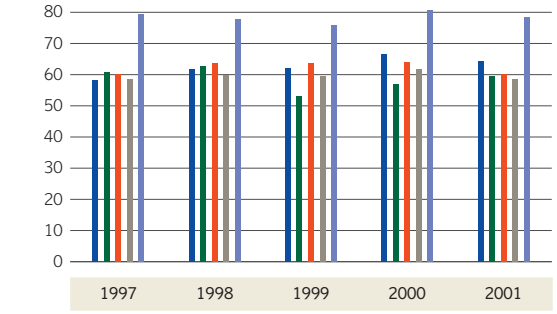
Background: Cabin factor is a measurement of utilized production capacity.
SAS Airline's progress: Total cabin factor fell somewhat during the year due to the recession that began during the second quarter. The figures include passengers paying above a certain fare threshold (revenue passengers). The total number of passengers is approx. 10% higher. If all are included, SAS Airline's cabin factor for 2001 would be 70.8%.

SAS Airline



Cabin factor

Cabin factor · By region



[%]	1997	1998	1999	2000	**2001**
Denmark	58.2	61.9	62.1	66.7	**64.4**
Norway	60.9	62.6	53.0[2]	57.0	**59.4**
Sweden	60.2	63.6	63.8	64.0	**60.1**
Europe[1]	58.5	59.9	59.4	61.7	**58.7**
Intercont.	79.4	77.9	75.8	80.6	**78.5**

[1] *Including Scandinavian traffic.*

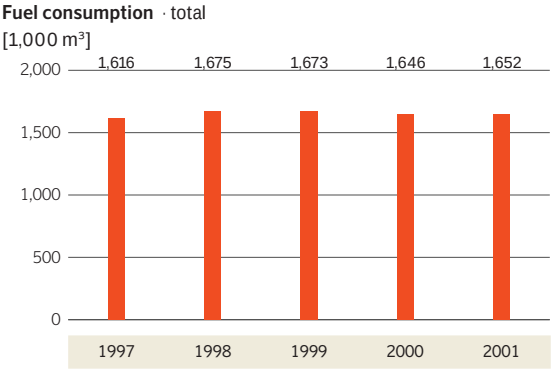
Flight operations
- Production
- Cabin factor
- Fuel consumption
- Emissions into the air
- Aircraft fleet

Ground operations
- Noise
- Consumption of chemicals
- Emissions into water
- Maneged facilities
- Recource use
- Emissions into the air
- Fuel consumption
- Waste

Catering operations
- Consumption of raw materials
- Waste
- Use of chemicals

SAS Airline

Fuel consumption



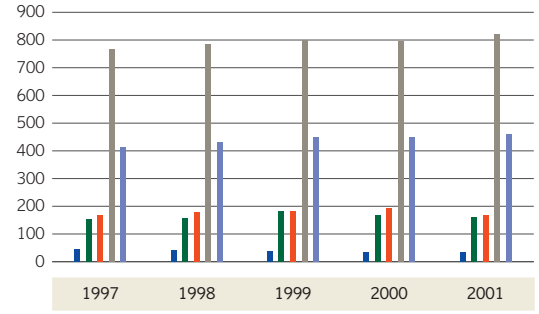
Background: Aviation, for the foreseeable future, will be dependent on fossil fuels. Combination of fossilfuels generates emissions that impact the environment.
SAS Airline's progress: Fuel consumption has risen marginally during the year due to increased production.

SAS Airline

Fuel consumption

Fuel consumption · By region

[1,000 m³]



[1,000 m³]	1997	1998	1999	2000	**2001**
Denmark	45	40	37	33	**34**
Norway	154	155	182	168	**160**
Sweden	168	179	181	192	**168**
Europe[1]	768	786	799	794	**821**
Intercont.	413	432	450	450	**460**

[1] *Including intra-Scandinavian traffic.*

Flight operations

- Production
- Cabin factor
- Fuel consumption
- Emissions into the air
- Aircraft fleet

Ground operations

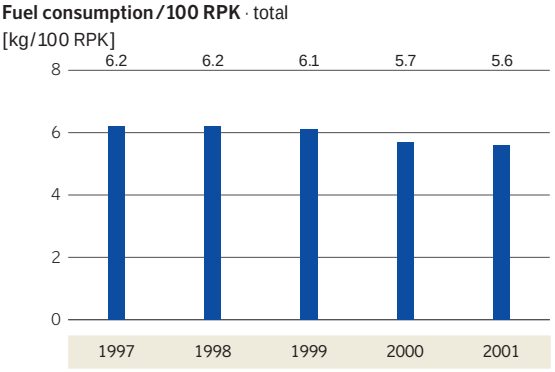
- Noise
- Consumption of chemicals
- Emissions into water
- Maneged facilities
- Recource use
- Emissions into the air
- Fuel consumption
- Waste

Catering operations

- Consumption of raw materials
- Waste
- Use of chemicals

SAS Airline

Fuel consumption

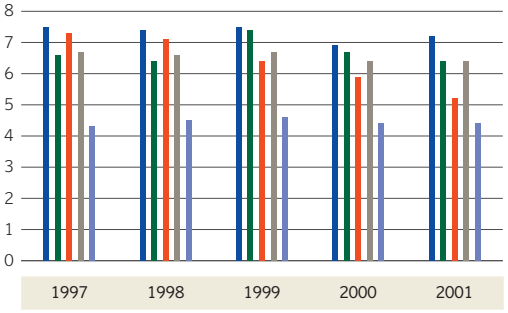


Background: Fuel consumption measured per RPK indicates relative fuel consumption.
SAS Airline's progress: Fuel consumption has fallen somewhat in recent years. Despite the airline industry's difficulties during 2001, relative consumption fell as well.

SAS Airline

Fuel consumption

Fuel consumption /100 RPK · By region
[kg/100RPK]

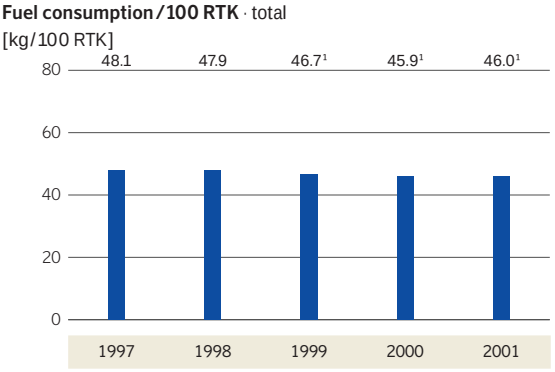


[kg/100 RPK]	1997	1998	1999	2000	**2001**
Denmark	7.5	7.4	7.5	6.9	**7.2**
Norway	6.6	6.4	7.4[1]	6.7	**6.4**
Sweden	7.3	7.0	6.4	5.9[1]	**5.2**
Europeb	6.7	6.6	6.7	6.4	**6.4**
Intercont.	4.3	4.5	4.6	4.4	**4.4**

[1] Including Scandinavian traffic.

SAS Airline

Fuel consumption



¹ RTK purchased from other carriers not included.

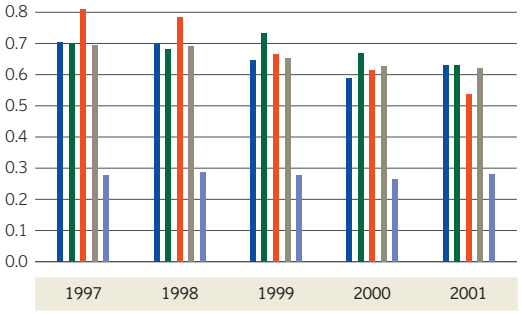
Background: Fuel consumption measured per RTK indicates relative fuel consumption.
SAS Airline's progress: In recent years relative fuel consumption has trended downward, whereas there was a marginal rise between 2000 and 2001.

SAS Airline

Fuel consumption

Fuel consumption /RTK · By region

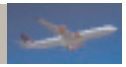
[kg]



[kg/RTK]	1997	1998	1999	2000	**2001**
Denmark	0.705	0.699	0.645	0.588	**0.608**
Norway	0.702	0.682	0.733	0.670	**0.630**
Sweden	0.810	0.785	0.665	0.613	**0.536**
Europe[1]	0.694	0.692	0.653	0.628	**0.620**
Intercont.	0.278	0.288	0.277	0.265	**0.280**

[1] *Including Scandinavian traffic.*

SAS Airline



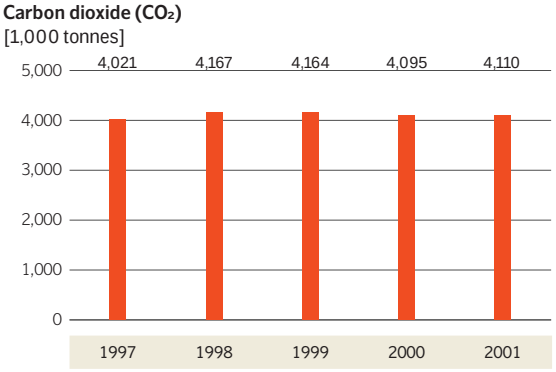
Fuel consumption

Jettisoning of fuel

During 2001 no fuel was jettisoned.

SAS Airline

Emissions into the air – flight operations



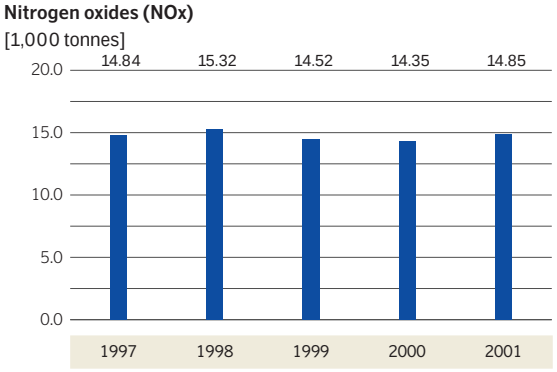
	1997	1998	1999	2000	**2001**
g/RPK	194	196	192	179	**176**
g/RTK	1,517	1,510	1,470	1,447[1]	**1,449[1]**
g/ASK	126	129	123	120	**114**

[1] RTK purchased from other carriers not included.

Background: Flight operations' carbon dioxide emissions are calculated on the basis of fuel consumption (3,15 kg CO_2 is formed per kg fuel burned).
SAS Airline's progress: For SAS Airlines it is crucial to reduce fuel consumption, for environmental and especially economic reasons, since fuel is a significant cost item. CO_2 emissions are directly proportionate to fuel consumption. During 2001 total fuel consumption rose somewhat, while production grew measured by both RPK and RTK. CO_2 emissions rose in proportion to production, which is explained by a reduced cabin factor.

SAS Airline

Emissions into the air – flight operations



	1997	1998	1999	2000	**2001**
g/RPK	0.72	0.72	0.67	0.63	**0.64**
g/RTK	5.6	5.6	5.1[1]	5.1 [1]	**5.2 [1]**

[1] RTK purchased from other carriers not included.

Background: Permitted aircraft engine nitrogen oxide emissions are limited by ICAO certification standards, which will be tightened after 2004.
SAS Airline's progress: SAS Airline's nitrogen oxides emissions are calculated on the basis of distance flown plus a conversion factor of 0.0552 kg/km. Specific to SAS Airlines, this factor is based on the composition and operating pattern of the aircraft fleet. The NOx factor for 2001 is 2.8% higher than the previous year, owing to modernizing the fleet with a larger share of bigger aircraft. The measurable increase in nitrogen oxides emissions can be explained to a certain degree by the fact that a higher conversion factor was used in the calculation.

Flight operations
- Production
- Cabin factor
- Fuel consumption
- Emissions into the air
- Aircraft fleet

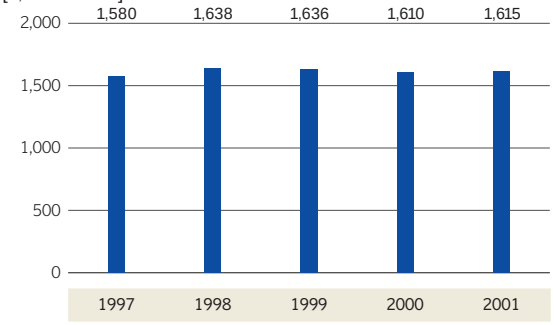
Ground operations
- Noise
- Consumption of chemicals
- Emissions into water
- Maneged facilities
- Recource use
- Emissions into the air
- Fuel consumption
- Waste

Catering operations
- Consumption of raw materials
- Waste
- Use of chemicals

SAS Airline

Emissions into the air – flight operations

Water vapor (H_2O)
[1,000 tonnes]

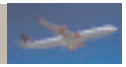


	1997	1998	1999	2000	**2001**
g/RTK	596	594	578[1]	569[1]	**569**[1]

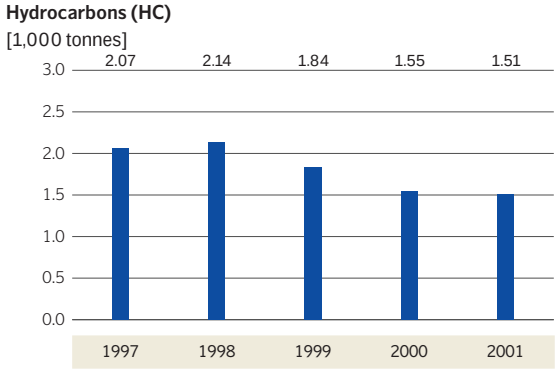
[1] *RTK purchased by SAS Cargo from other carriers not included.*

Background: Water vapor is formed in proportion to fuel consumption (1.238 kg water vapor per kg fuel). Water vapor condenses under certain conditions, forming the so-called vapor trails seen behind aircraft flying at high altitudes. The data suggest a connection between condensates in contrails and the formation of cirrus clouds, which likely contributes to the greenhouse effect.
SAS Airline's progress: The amount of water vapor formed rose by 0.4% during 2001, which is due to a slight increase in fuel consumption. Relative to production the amount of water vapor rose by 0.1%.

SAS Airline



Emissions into the air – flight operations

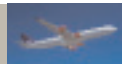


	1997	1998	1999	2000	**2001**
g/RTK	0.78	0.77	0.65[1]	0.55[1]	**0.53[1]**

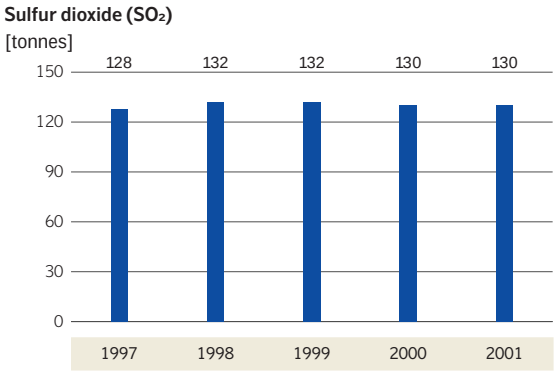
[1] RTK purchased by SAS Cargo from other carriers not included.

Background: The data refer to those hydrocarbons, excluding VOCs, covered by ICAO certification standards, which limit aircraft engine hydrocarbon emissions.
SAS Airline's progress: SAS Airlines hydrocarbon emissions are calculated on the basis of distance flown, using a calculation factor of 5.6 (5.8) g/km. Specific to SAS Airline, this factor is dependent on fleet composition and the company's operational patterns. The improvement is due to to SAS Airline's gradual phasing-in of new aircraft with lower emissions. During 2001 SAS Airline's emissions of hydrocarbons fell by 2.8%.

SAS Airline



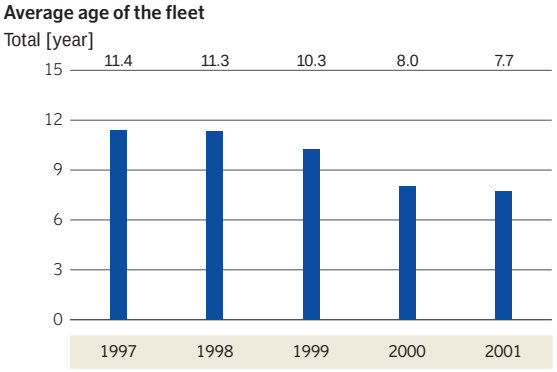
Emissions into the air – flight operations



Background: Sulfur dioxide is formed in proportion to fuel consumption. 1 g SO^2 per kg fuel is formed.
SAS Airline's progress: The quantity of SO^2 formed in 2001 increased by 0.4% because of a slight increase in fuel consumption. In proportion to production the quantity of SO^2 increased by 0.1%.

SAS Airline

Aircraft fleet



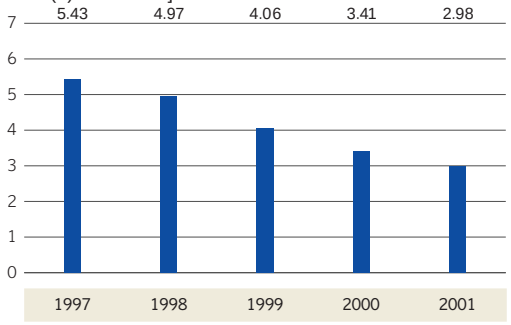
[years]	1997	1998	1999	2000[1]	**2001**
Total	11.4	11.3	10.3	8.0	**7.7**

[1] *The figures show the average age of the aircraft making up SAS Airline's fleet. The decline in average age is due to the phasing-in of new aircraft.*

SAS Airline

Noise

Noise impact
[km²/85dB(A) on takeoff[1]]

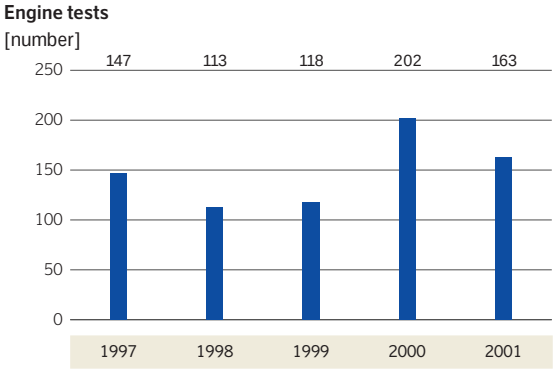


[1] *Weighted noise contour by number of takeoffs per day by the various aircraft types in SAS's route system.*

SAS Airline's progress: SAS Airline's overall noise impact fell due to the ongoing phasing in of new, quieter aircraft. SAS Airline uses only low-noise so-called Chapter 3 aircraft. SAS's forecast is for the noise impact of the company's aircraft to be cut in half by 2003 compared with 1995.

SAS Airline

Noise

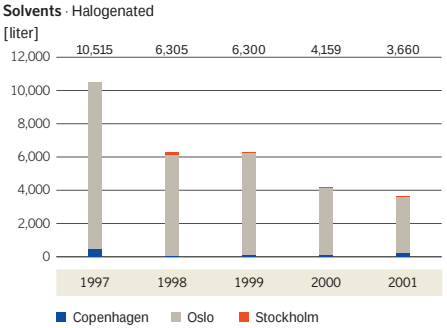


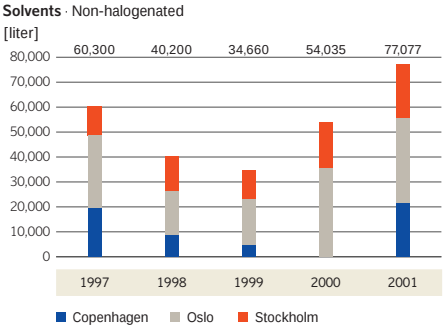
¹ Includes only engine tests after replacing engines on aircraft.

Background: Engine tests involve running the aircraft engines at various load levels to guarantee function after servicing. The periods of running full throttle comprise a only a relatively small part of the tests, normally not exceeding 4–5 minutes of a testing sequence of e.g. 30 minutes. All engine testing takes place at special noise-insulated locations. The report includes only testing in connection with motor replacement. Tests are also performed in connection with engine repairs and maintenance.
SAS Airline's progress: The relatively low figures for engine tests during 1998 and 1999 are connected with the move to Gardermoen, which resulted in reduced activity in large-scale maintenance and subsequent engine testing. During 2000, however, the number of engine tests was unusually high, principally due to the unusual frequency of engine problems involving DC-9s and Boeing 737s.

SAS Airline

Consumption of chemicals

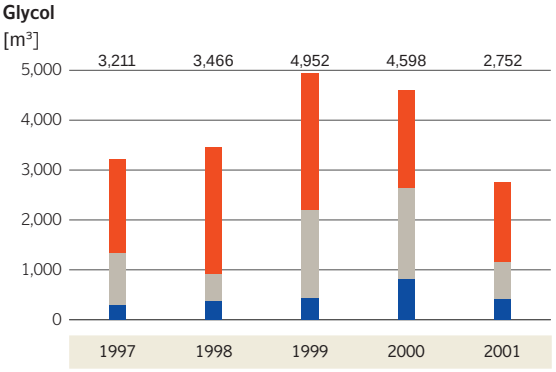




Background: The absolute lion's share of the halogenated solvents consists of trichloroethylene and 1.1.1-trichloroethane for degreasing and cleaning in Oslo. In Copenhagen and Stockholm methylene chloride is used. Most of the non-halogenated solvents consist of water-based cleaners, paints and thinners.
SAS Airline's progress: The lower use of halogenated solvents in Oslo during 2001 is primarily due to an ever-increasing use of water-based solvents.

SAS Airline

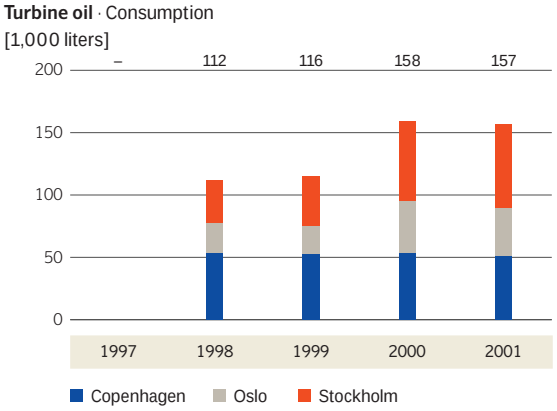
Consumption of chemicals



Background: Glycol is sprayed on aircraft to prevent ice build-up in cold weather. There are two mixtures with varying concentration of glycol for various temperatures – here they are converted to 100% glycol.
SAS Airline's progress: The sharp reduction from winter 1999/2000 to winter 2000/01 can be attributed to a season with weather conditions that required less deicing in both Norway and Denmark.

SAS Airline

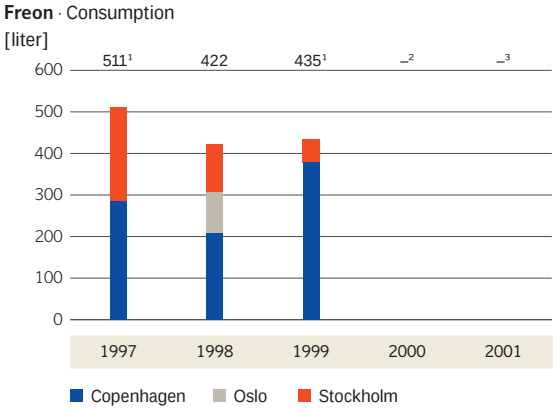
Consumption of chemicals



Background: Turbine oil lubricates the engines' bearings, but has a limited life. Therefore it is drained continuously and in small amounts right out into the air or burned in the turbine, depending on which bearing the oil is drained from.
SAS Airline's progress: Consumption of turbine oil is approximately at last year's level.

SAS Airline

Consumption of chemicals

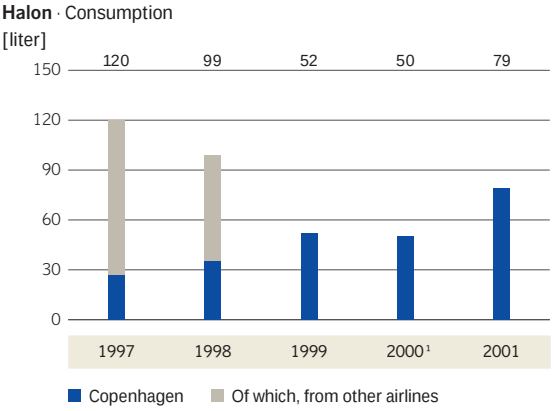


¹ No data from Oslo ² No data for 2000 ³ No data for 2001

SAS Airline's progress: Chlorofluorocarbons (CFCs) including freon (for air conditioning) are being phased out. The reported consumption is due to normal leakage in connection with maintenance.

SAS Airline

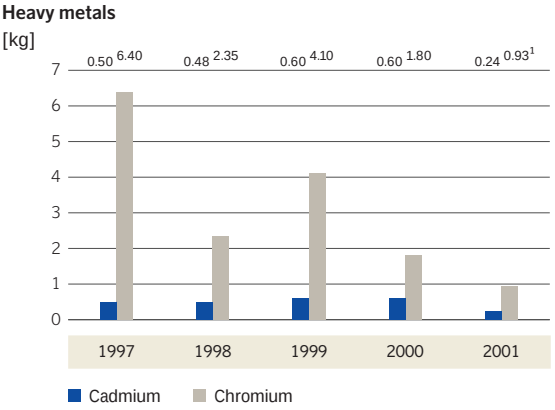
Consumption of chemicals



Background: The airlines' use of halons for emergency measures such as extinguishing fires on board and in engines is an exception to the general prohibition of halons in the Montreal Protocol.
SAS Airline's progress: In Copenhagen SAS Airline has a facility for recovering halons that serves many carriers in addition to SAS Airline. SAS Airline's stock of halons at the end of 2001 comprised approx. 4,271 kg.

SAS Airline

Emissions into water



[1] *Data from Stockholm cover only the period Jan.–Nov. 2001.*

Background: SAS Airline's release of heavy metals is primarily caused by airborne contaminates that attach themselves to the aircraft during flight and are flushed off during washing and in the electroplating workshop. The maximum total release is set forth in permits.
SAS Airline's progress: In Oslo SAS Airline's technical department at the new airport at Gardermoen has a completely closed purification facility for process water that yields zero release to the recipient. Process water is evaporated and reused, whereas the semi-dry fraction is treated as hazardous waste. Also SAS Airline's new purification plant at Arlanda that came into service in spring 1999 helps to lower the release of heavy metals.

A new purification plant in Copenhagen explains the drop in the release of heavy metals in 2001.

SAS Airline

Managed facilities

Managed facilities

[1,000 m²]	*Total managed floor space* 2000	**2001**	*Total floor space with recorded resource consumption* 2000	**2001**
Denmark	238	**240**	222	**218**
Norway	124	**163**	124	**91**
Sweden	319	**299**	220	**256**
Total	765	**702**	631	**565**

Background: For some of the space that SAS Airline does not own but leases, resource consumption is not recorded on SAS Airline's account but on the landlord's. The data in this environmental report related to office space refers to premises where resource consumption and environmental impact are recorded for SAS Airline.
SAS Airline's progress: During 2001, 11 properties were sold on a sale-leaseback agreement.

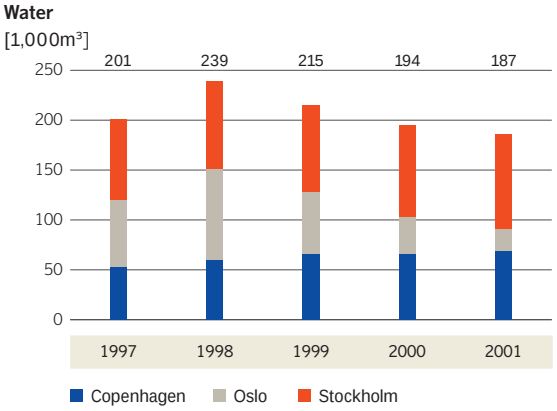
Flight operations
- Production
- Cabin factor
- Fuel consumption
- Emissions into the air
- Aircraft fleet

Ground operations
- Noise
- Consumption of chemicals
- Emissions into water
- Maneged facilities
- Recource use
- Emissions into the air
- Fuel consumption
- Waste

Catering operations
- Consumption of raw materials
- Waste
- Use of chemicals

SAS Airline

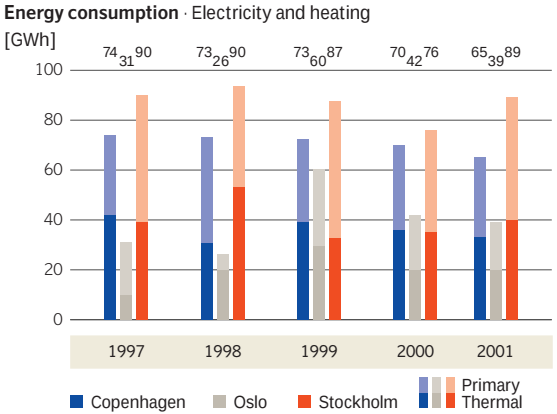
Resource use – ground operations



Background: By far most water consumption takes place in connection with aircraft maintenance at the three technical bases.
SAS Airline's progress: In all, water consumption has fallen at the three bases. This is primarily due to a sharp decline in Oslo (Gardermoen), which is explained by the fact that problems in 1998 with the recirculation of cooling water at the electroplating workshop at Fornebu were dealt with. In Copenhagen and Stockholm water consumption is at 1999 levels.

SAS Airline

Resource use – ground operations



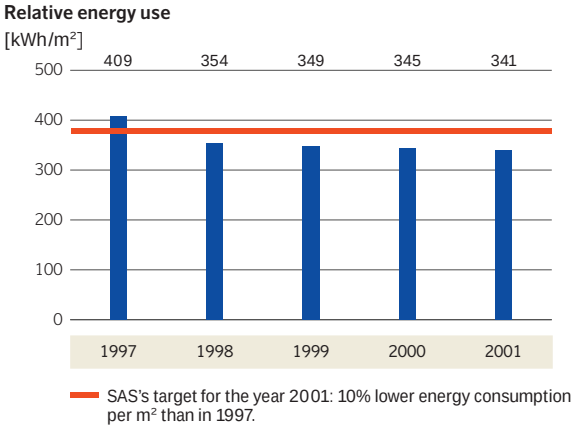
[GWh]	1997	1998	1999	2000	**2001**
Total	194	193	220	195	**193**

Background: The energy that SAS Airline consumes is of two kinds, so-called primary (electricity for lighting and machine operation) and thermal (electricity, oil or LPG for heating). The major energy consumers are lighting and heating for hangars and workshops, air compressors, electricity for aircraft, electroplating baths and electricity for offices (lighting, heating and computer equipment). In Copenhagen district heating and natural gas are used for heating. At Gardermoen SAS Airline's buildings are supplied with district heating, chiefly based on burning sawdust, with oil added. In Stockholm biofuels-based district heating has been in use since 1997.

SAS Airline's progress: SAS Airline has an ongoing energy-saving campaign at all its bases. SAS's headquarters in Stockholm is supplied by an geothermal plant that during 1999 met between 70 and 80% of its energy needs, with the rest supplied by electricity.

SAS Airline

Resource use – ground operations



	1997	1998	1999	2000	**2001**
Electricity and heat [GWh]	194	193	220	195	**193**
Managed floor space [1,000 m²]	475	545	631	565	**565**

Background: SAS Airline's measures ecoefficiency here as the ratio of recorded energy consumption to the share of SAS Airline's owned floors pace to which that consumption is attributed. In 1999 SAS Airline's large new structures, the Cargo Terminal in Copenhagen and premises at Gardermoen, came into service and since then are included in these calculations.
SAS Airline's progress: Already in 1998, SAS Airline achieved its target of reducing energy consumption per m² by 10% compared with 1997. No new target has been set for lower energy consumption. Relative energy consumption has remained more or less constant since then.

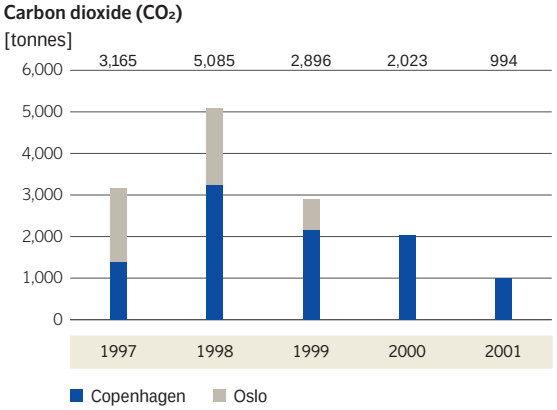
Flight operations
- Production
- Cabin factor
- Fuel consumption
- Emissions into the air
- Aircraft fleet

Ground operations
- Noise
- Consumption of chemicals
- Emissions into water
- Maneged facilities
- Recource use
- Emissions into the air
- Fuel consumption
- Waste

Catering operations
- Consumption of raw materials
- Waste
- Use of chemicals

SAS Airline

Emissions into the air – ground operations



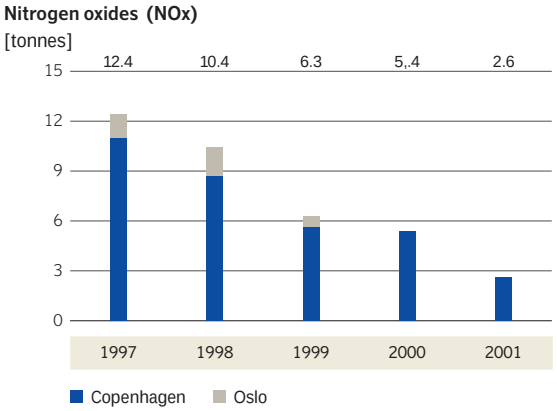
[1] Corrected compared with the environmental report for 1998 regarding final data.

Background: In certain cases, oil is used to heat SAS Airline's facilities.
SAS Airline's progress: SAS Airline has gradually increased the role played by district heating in its facilities. In 1997 SAS Airline at Arlanda Airport converted to district heating from a biofuels-fed thermal plant, which explains why CO_2 emissions from heat generation have ceased completely. Oslo's new airport at Gardermoen also utilizes biofuels-based district heating. Thus it is only in Copenhagen oil is used for heat generation. Up to 80% of SAS Airline's head offices' heating needs is provided by a geothermal plant.

Lowered carbon dioxide emissions in Copenhagen between 2000 and 2001 is primarily due to lower consumption of heating oil.

SAS Airline

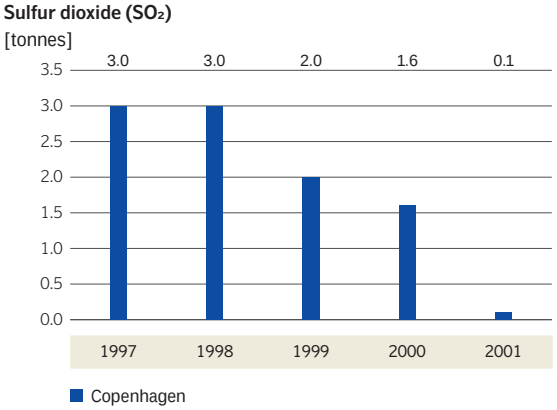
Emissions into the air – ground operations



Background: In certain cases, oil is used to heat SAS Airline's facilities.
SAS Airline's progress: SAS Airline has gradually increased the role played by district heating in its facilities. In 1997 SAS Airline at Arlanda Airport converted to district heating from a biofuels-fed thermal plant, which explains why NOx emissions from heat generation ceased completely. Oslo's new airport at Gardermoen also utilizes biofuels-based district heating. Thus it is only in Copenhagen oil is used for heat generation. Up to 80% of SAS Airline's head offices' heating needs is provided by a geothermal plant. Lowered NOx emissions in Copenhagen between 2000 and 2001 are primarily due to lower consumption of heating oil.

SAS Airline

Emissions into the air – ground operations



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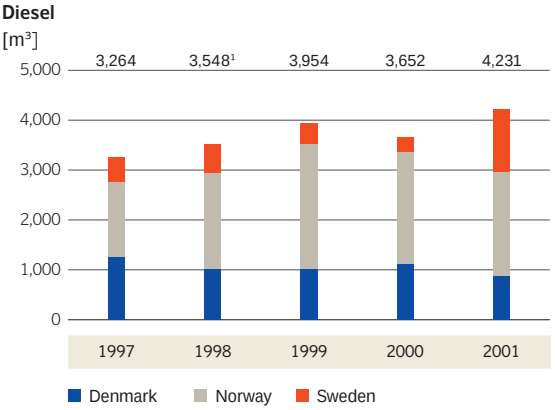
SAS Airline's progress: SAS Airline has gradually increased the role played by district heating in its facilities. In 1997SAS Airline at Arlanda Airport converted to district heating from a biofuels-fed thermal plant, which explains why SO^2 emissions from heat generation ceased completely. Oslo's new airport at Gardermoen also utilizes biofuels-based district heating. Thus it is only in Copenhagen oil is used for heat generation. Up to 80% of SAS Airline's head offices' heating needs is provided by a geothermal plant. Lowered SO^2 emissions in Copenhagen between 2000 and 2001 is primarily due to lower consumption of heating oil.

SAS Airline

Fuel consumption – ground operations



¹ Since 1998 the values in all instances including line stations have been reported.

Background: SAS Airline strives to use only diesel of the highest quality environmentally speaking in the countries where it operates.
SAS Airline's progress: The reduced consumtion 2001 can not be explained on the basis of available information.

Flight operations

- Production
- Cabin factor
- Fuel consumption
- Emissions into the air
- Aircraft fleet

Ground operations

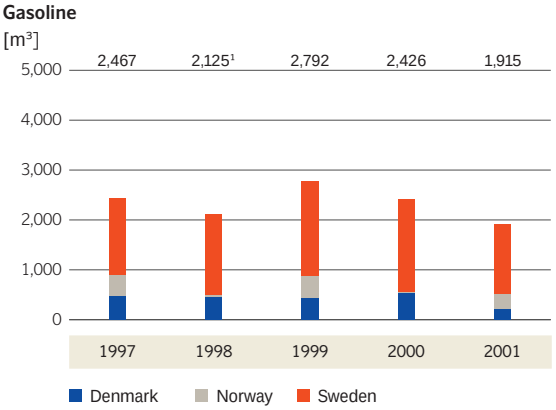
- Noise
- Consumption of chemicals
- Emissions into water
- Maneged facilities
- Recource use
- Emissions into the air
- Fuel consumption
- Waste

Catering operations

- Consumption of raw materials
- Waste
- Use of chemicals

SAS Airline

Fuel consumption – ground operations

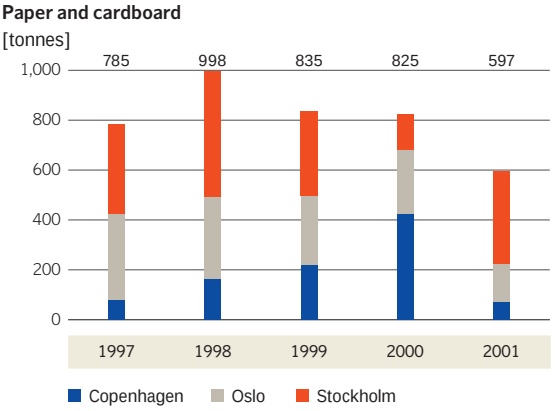


¹ Since 1998 the values in all instances including line stations have been reported.

Background: SAS Airline strives to use only gasoline of the highest quality environmentally speaking in the countries where it operates.
SAS Airline's progress: The reduction in consumption in 2001 cannot be explained, because of uncertainty in the underlying data.

SAS Airline

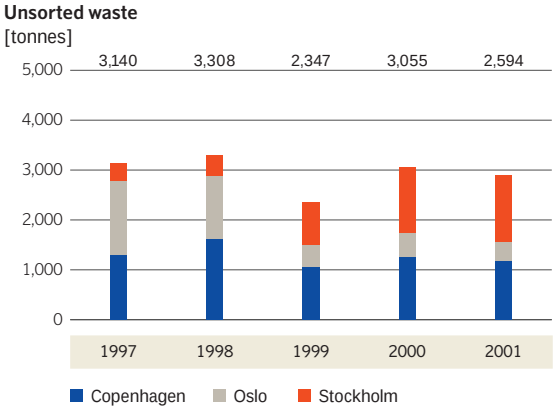
Waste – ground operations



Background: All paper and cardboard is delivered to an approved subcontractor that sorts waste for recycling.
SAS Airline's progress: The reduction from 2000 to 2001 cannot be explained on the basis of available information.

SAS Airline

Waste – ground operations



Background: All waste is delivered to an approved subcontractor that sorts waste for recycling.
SAS Airline's progress: The quantity of unsorted waste has remained largely unchanged.

Flight operations

- Production
- Cabin factor
- Fuel consumption
- Emissions into the air
- Aircraft fleet

Ground operations

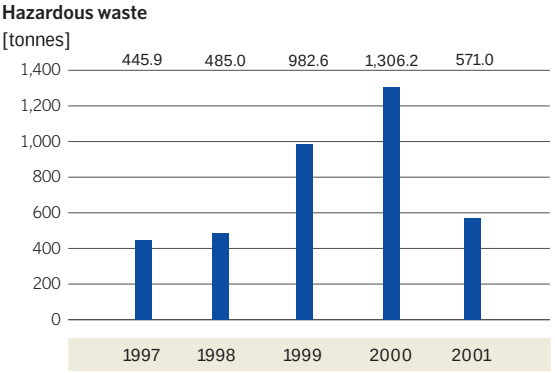
- Noise
- Consumption of chemicals
- Emissions into water
- Maneged facilities
- Recource use
- Emissions into the air
- Fuel consumption
- Waste

Catering operations

- Consumption of raw materials
- Waste
- Use of chemicals

SAS Airline

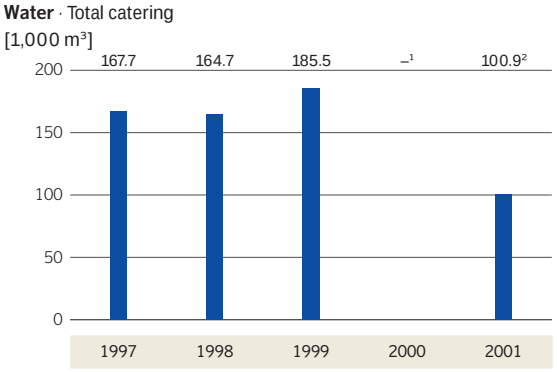
Waste – ground operations



Background: Hazardous waste is generated chiefly in workshops and includes waste from chemicals that may not be deposited in municipal landfills but must be specially treated. In Denmark, Norway and Sweden, SAS Airline delivers hazardous waste to an approved subcontractor for processing, recycling or destruction, reporting this to the authorities. Hazardous waste may vary somewhat due to irregular deliveries and show oscillations that are not directly linked to production.
SAS Airline's progress: Most of the increase by far from 1999 to 2000 is attributed to the destruction of 528 (285) m^3 contaminated water from Gardermoen. The remaining increase can be explained by production growth. The decline from 2000 to 2001 is partly explained by the fact that a large purification plant at Gardermoen reduces the need to destroy contaminated water.

SAS Airline

Consumption of raw materials – catering operations

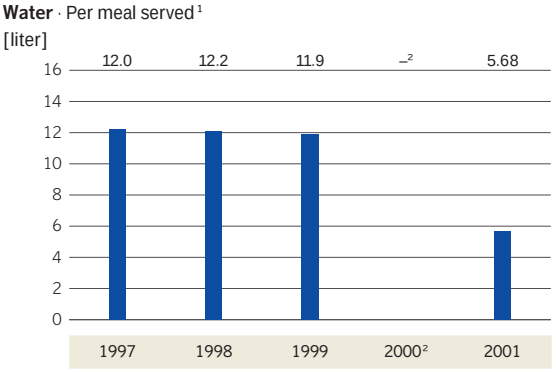


¹ Data for 2000 missing.
² Uncertainty in the data provided by LSG in Stockholm.

Background: Most of the water consumption in catering operations is generated by dishwashing, washing and other production.
SAS Airline's progress: Reduced water consumption is the result of new and rebuilt facilities with reduced water requirements have been brought on line. Earlier problems with increasing water consumption in Copenhagen have been remedied.

SAS Airline

Consumption of raw materials – catering operations



[1] *The meals SAS Airline obtains from its suppliers in Copenhagen, Oslo and Stockholm, since 1997 also including Gothenburg and Malmö.*
[2] *Data for 2000 missing*

SAS Airline's progress: The fall in reported water consumption by half can be explained by new, more efficient facilities coming on line as well as by the fact the previous problems at the facility in Copenhagen have been remedied.

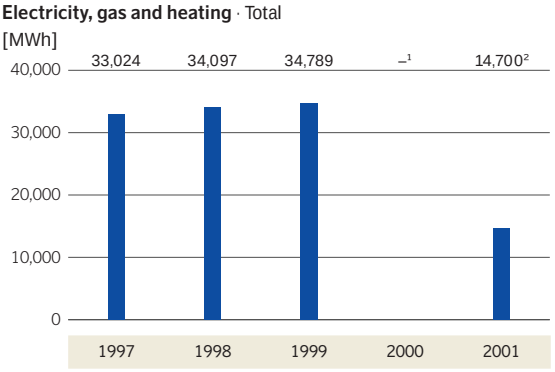
Flight operations
- Production
- Cabin factor
- Fuel consumption
- Emissions into the air
- Aircraft fleet

Ground operations
- Noise
- Consumption of chemicals
- Emissions into water
- Maneged facilities
- Recource use
- Emissions into the air
- Fuel consumption
- Waste

Catering operations
- Consumption of raw materials
- Waste
- Use of chemicals

SAS Airline

Consumption of raw materials – catering operations

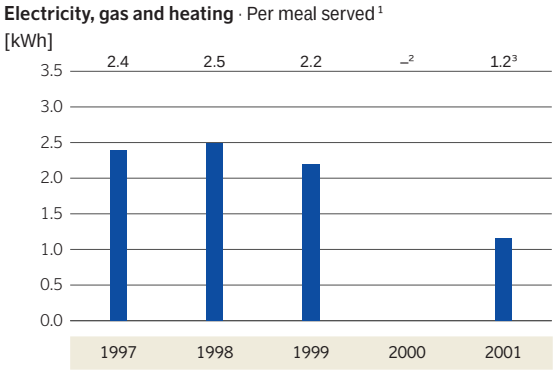


¹ Data for 2000 missing
² Uncertainty in the data from LSG in Stockholm.

Background: Electricity, gas and heat are used primarily to produce inflight meals and heating facilities.
SAS Airline's progress: The fall in energy consumption by half can be explained by new, refurbished facilities coming on line, using an in part different production system.

SAS Airline

Consumption of raw materials – catering operations



[1] *The meals SAS Airline obtains from its suppliers in Copenhagen, Oslo and Stockholm, since 1997 also including Gothenburg and Malmö.*
[2] *Data for 2000 missing.*
[3] *Stockholm is not included in the calculation due to uncertainty in the data.*

SAS Airline's progress: New, more efficient facilities have come on line, which have reduced energy consumption. The reduction is also due to altered production where parts of inflight meals are produced by subcontractors. Several ongoing environmental projects aim at reducing energy consumption despite increasing needs for dishwashing for reuse.

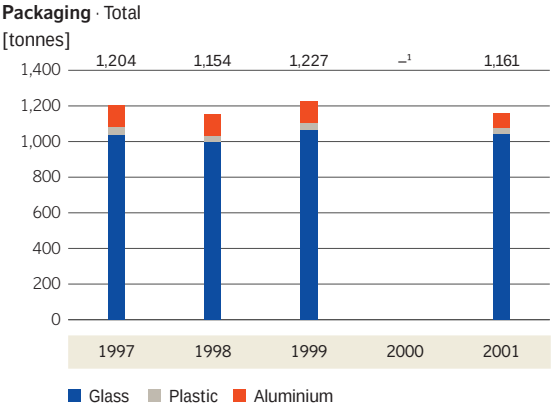
Flight operations
- Production
- Cabin factor
- Fuel consumption
- Emissions into the air
- Aircraft fleet

Ground operations
- Noise
- Consumption of chemicals
- Emissions into water
- Maneged facilities
- Recource use
- Emissions into the air
- Fuel consumption
- Waste

Catering operations
- Consumption of raw materials
- Waste
- Use of chemicals

SAS Airline

Waste – catering operations



[1] Data for 2000 missing

Background: Packaging is used for wrapping and food and beverages.
SAS Airline's progress: SAS Airline is working to increase recycling of packaging, above all of aluminum beverage cans.

Flight operations

- Production
- Cabin factor
- Fuel consumption
- Emissions into the air
- Aircraft fleet

Ground operations

- Noise
- Consumption of chemicals
- Emissions into water
- Maneged facilities
- Recource use
- Emissions into the air
- Fuel consumption
- Waste

Catering operations

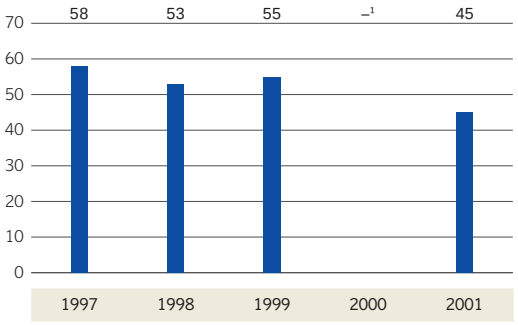
- Consumption of raw materials
- Waste
- Use of chemicals

SAS Airline

Waste – catering operations

Packaging per passenger

[g]



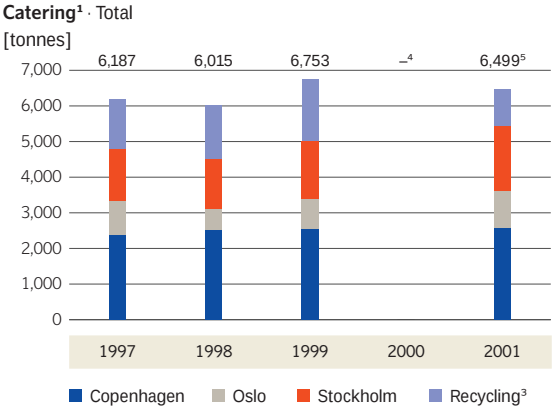
[1] Data for 2000 missing.

Background: Previously, aluminum was not a permitted material for beverage cans in Denmark. Starting in summer 2001 it was permitted, and SAS Airlines will consider using aluminum cans on board Danish domestic flights.

SAS Airline's progress: Collection of aluminum cans for recycling takes place on Norwegian domestic flights (as prescribed by law) and in Sweden. In Norway in 2001 14.26 tonnes of aluminum were collected, which means 46 (76)% collected aluminum. In Sweden only 1.16 tonnes collected aluminum was recorded, primarily due to failings in the recording system. Measures to correct these and improve collection routines have been implemented.

SAS Airline

Waste – catering operations

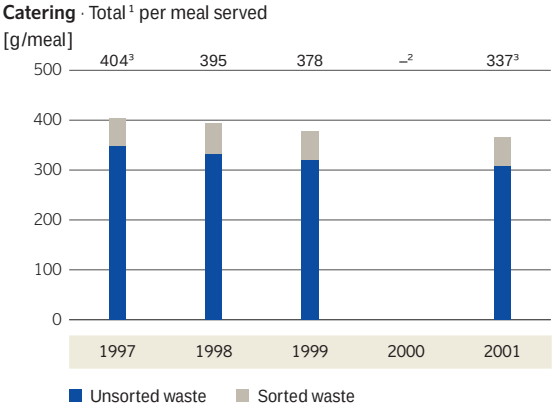


[1] Waste handled by SAS Airline's subcontractor, computed on the basis of data on SAS Airline's share of subcontractor's total quantity of waste.
[2] Since 1997 including Gothenburg and Malmö airports.
[3] Incl. newspapers.
[4] Due to the replacement of inflight caterer, it was not possible to produce reliable data for the entire year 2000.
[5] Since 2001 including Bergen.

SAS Airline's progress: The amount of waste from catering has fallen somewhat since 1999 despite production growth

SAS Airline

Waste – catering operations



[1] Excluding newspapers.
[2] Data for 2000 missing.
[3] Expanded data basis.

SAS Airline's progress: The amount of waste per meal served has remained largely unchanged compared with 1999.

Flight operations
- Production
- Cabin factor
- Fuel consumption
- Emissions into the air
- Aircraft fleet

Ground operations
- Noise
- Consumption of chemicals
- Emissions into water
- Maneged facilities
- Recource use
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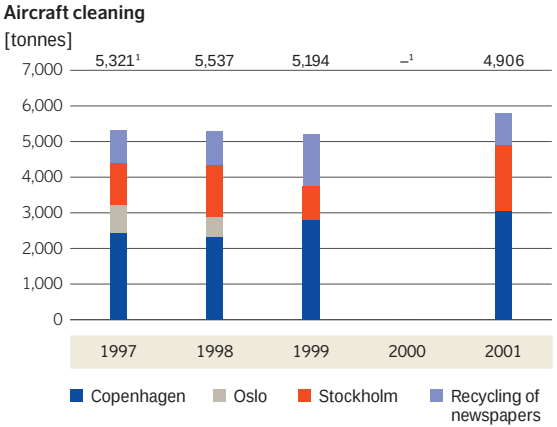
- Fuel consumption
- Waste

Catering operations
- Consumption of raw materials
- Waste
- Use of chemicals

SAS Airline

Waste – catering operations

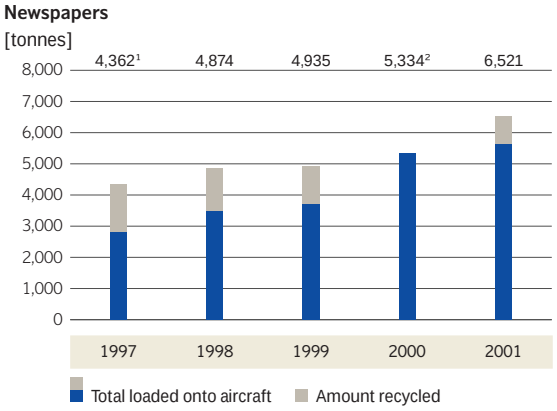


¹ Data for 2000 missing.

SAS Airline's progress: Starting in 1999 Oslo is no longer included in the data basis. This is due to the introduction of a new centralized system of collection for all waste from aircraft cabins as well as terminals at Gardermoen. Thus it is impossible to separate SAS Airline's cabin waste from other waste.

SAS Airline

Waste – catering operations

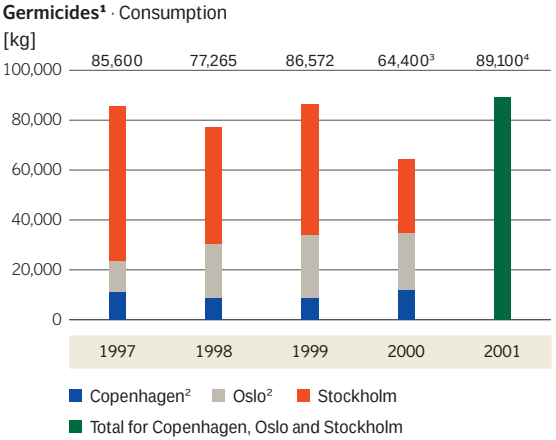


¹ In 1997 including a certain percentage of other kinds of paper.
² Date missing on how many tonnes of newsprint were recycled during 2000.

Background: Newspapers are purchased and distributed to passengers. Some newspapers are collected during aircraft cleaning and the rest are taken by passengers when leaving the aircraft.
SAS Airline's progress: In all an average of 281 (228) g of newspapers per passenger was loaded on board SAS flights in 2001.

SAS Airline

Use of chemicals – cabin operations



[1] Used by SAS Airline in Copenhagen and Oslo (quaternary ammonium compound). Used until 2000 by the Civil Aviation Authority in Stockholm (sodium hydroxymethane sulfonate). From 2001 SAS Airline purchases it for its own use and for other carriers with service agreements with SAS Airline.

[2] SAS Airline's own consumption as well as SAS Airline's deliveries to other carriers.

[3] As opposed to data from previous years, data from 2000 are adjusted to include only SAS Airline's own consumption.

[4] It has not been possible to differentiate consumption per station for 2001.

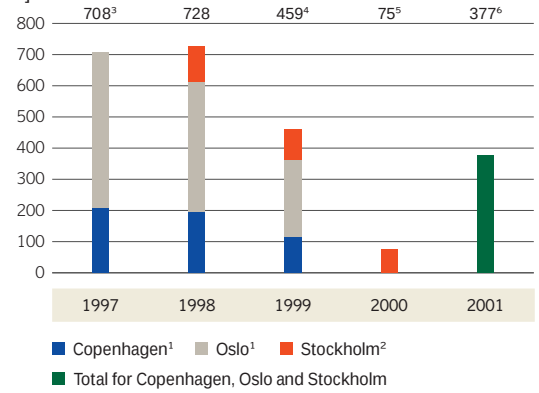
Background: Germicides are added to the sanitary fluid in the onboard toilets to reduce the risk of contagion among passengers and staff. The concentration of active ingredients is optimized so that, on the one hand, bacteria and viruses are killed in toilet waste, but on the other hand, the effect is eliminated after being diluted a couple of times in order to protect the bacterial flora in purification plants.
SAS Airline's progress: Total consumption of germicides remains largely unchanged.
For 2001 it is not possible to separate consumption among the various stations and various companies.

SAS Airline

Use of chemicals – cabin operations

Chlorine[1] · Consumption

[liter]



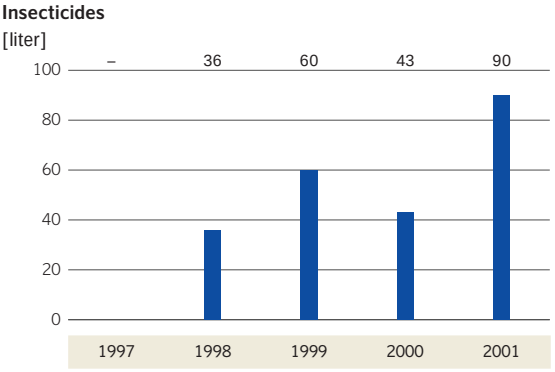
[1] SAS Airline's own consumption plus SAS Airline's deliveries to other carriers.
[2] The amount SAS Airline purchases from the Civil Aviation Authority at Arlanda Airport.
[3] Due to interruptions in operating routines in Stockholm, when the Civil Aviation Authority for a lengthy period suspended supplies and SAS temporarily was allowed to take over refilling chlorine, it is impossible to present data from Stockholm for 1997.
[4] The large reduction compared with 1998 is likely due to changed mixture of active chlorine.
[5] Complete data missing for Copenhagen and Oslo.
[6] The collection system cannot distinguish consumption of chlorine in Copenhagen, Oslo and Stockholm.

Background: The water on board is classified as potable, even though in principle it is only used for laundering, dishwashing and making coffee. To prevent the spread of waterborne illnesses, the water is disinfected with the addition of a chlorine solution before it is pumped into the aircraft. Chlorinated compounds (sodium hypochlorite at a concentration of 10-15% active chlorine is diluted to no higher than 3 ppm in the ready-to-use solution). Remaining water in the tank is emptied into the municipal sewer systems at SAS Airlines main bases during lengthy stays on the ground.

SAS Airline's progress: Total consumption of germicides is largely unchanged. For 2001 it is not possible to separate consumption among the various stations and various companies.

SAS Airline

Use of chemicals – cabin operations



Background: SAS Airline uses the insecticide Permethrin as a means of controlling pests on board flights to Delhi, at the request of the Indian authorities, who also has drawn up directions for use. Permethrin is a targeted insecticide, approved by WHO for the application in question.
The active ingredient is related to pyrethrin I and II that occurs naturally in daisies. The substance is biodegradable and without any tendency to bioaccumulation. SAS Airline has not received any reports of inconvenience or side-effects due to use.

This is the SAS Group

Since July 6, 2001, the SAS Group has had a single share through SAS AB, listed on the stock exchanges in Copenhagen, Oslo and Stockholm. The principal owners of SAS AB are the Danish, Norwegian and Swedish states which own 14.3%, 14.3% and 21.4%, respectively, of the shares and voting rights. The remaining 50% of the shares and voting rights are owned by private interests.

Four business areas

The SAS Group has a consolidated operating revenue of MSEK 51,400 and a total of 31,035 employees. The Group is divided into four business areas:

- SAS Airline comprises SAS's passenger transport services with its own aircraft and under its own brand. The business area includes the production company SAS Commuter as well as the independent business units Scandinavian Ground Services and Scandinavian Technical Services.
- Subsidiary & Affiliated Airlines comprises other airlines within the Group. The airline Braathens was acquired in 2001. Widerøe and Air Botnia were already SAS owned. In autumn 2001, an agreement was concluded to increase the holding in Spanair from 49% to 74%. The agreement is currently being examined by the EU Commission. Affiliated companies include Skyways, Cimber Air, British Midland, airBaltic and Grønlandsfly.
- Airline Related Businesses includes SAS Cargo, Jetpak, SMART, SAS Trading, SAS Hosting and SAS Media – all of which make most of their sales to external customers. The business area also includes SAS Flight Academy and SAS Flight Support, which sell services to internal and external airlines, as well as Scandinavian IT Group which has most of its customers within the SAS Group.
- Rezidor SAS Hospitality is the SAS Group's hotel business and works with two hotel chains, Radisson SAS Hotels & Resorts and Malmaison.

Highlights of 2001

- A New Group structure, which means that environmental work can be streamlined and coordinated, was introduced.
- A corporate sustainability, environmental and implementation policy was adopted.
- The acquisition of Braathens by SAS, which promises major efficiency and environmental benefits, was finalized

.

"Our goals remain firm"

When I became president and CEO of the SAS Group in May 2001 I took the reins of a prosperous company with a plan for vigorous growth. Our aim: to grow through recently as August. At the same time, I would like to stress that, in spite of the difficulties in the latter half of 2001, we achieved overall an improved environmental result. The environmental index improved by two points compared with 2000.
The market decline also affects the environmental result in other ways. For example, our decision to postpone the delivery of new aircraft for financial reasons will naturally have a short-term impact on SAS's environmental result. However, the decision does not mean we are lowering our ambitions. For economic reasons, too, all our long-term and strategic environmental goals remain firm.
Developments show that environment and economy go hand in hand. Indeed, the environment has become an important competitive factor. For example, more and more of our major customers are taking the environment into account when selecting their travel, transportation and accommodations providers.
Nor has anything changed with regard to our policy of continuous improvement. Even in times of crisis, all decisions made are to lead to improvements. During 2002 we will develop environmental programs for airline and hotel operations alike that will be the most ambitious in those respective industries. With consistent effort, we aim to show that we can be just a bit better than our nearest rivals. The goal is for SAS Airline to be the most environmentally-aware European carrier and for Rezidor SAS Hospitality to take a leading role as a responsible enterprise in the international hotel industry.

We believe in long-term, sustained growth in the airline sector. Civil aviation growth of approx. 5% per year until 2015, as predicted by the UN Intergovernmental Panel on Climate Change (IPCC), will impact the environment in a major way. Our goal, therefore, is to grow our business while reducing our relative environmental impact.
With a forecast growth of 5%, it is reasonable for the world community to take an interest in the environmental impact of the airline industry. Environmental issues were also highest on the agenda at the 2001 annual meeting of the UN International Civil Aviation Organization (ICAO). One of the issues discussed was a new certification standard for noise. Another was how the ICAO should proceed in determining how civil aviation should take its share of responsibility for reducing climatic impact in accordance with the Kyoto Protocol.
ICAO decided to tighten the standards for noise emission levels, and there are many indications they will be tightened even further when the EU introduces a new noise directive. I am happy to say that we await this directive with calm. The draft of the forthcoming EU directive shows we were on the right track in our continuous efforts to minimize the noise emissions of our aircraft. It also confirms the fact that we are doing the right thing in seeking the best commercially available technology when renewing our fleet.

Modernized aircraft fleet

We hope to see an economic upswing by the end of 2002. When that comes, we shall be well prepared. We have maintained our set level of investment and have continued to modernize our fleet in spite of the events of autumn 2001. We are going ahead with our previous decision to order new aircraft, but will, as I previously mentioned, postpone their delivery a few months.
This means we shall have an aircraft fleet that, over the next 5-year period, will comply with the coming environmental standards, especially those for noise emissions. For the subsequent period, however, our MD 80 fleet will be in the risk zone if noise standards are sharpened further.
More and more airports are introducing noise restrictions. We also know that individual airports as well as countries are considering introducing landing fees that vary according to the noise an aircraft generates. It is also becoming increasingly

common to introduce operational restrictions such as a ban on take-offs and landings, either during all or part of a 24-hour period, for aircraft exceeding a certain noise threshold.
For the SAS Group it is important for our aircraft to be able to land and take off at any time of day or night, and as near to major cities as possible. Our new fleet of aircraft will now enable us to do so. Having aircraft that meet the lowest permissible noise thresholds by a good margin and emit a minimal amount of nitrogen oxides provides us with greater flexibility in making optimum use of our aircraft.
This enhances the SAS Group's position in the ongoing restructuring of the European airline market. Airlines will inevitably become fewer in number, yet I am convinced that we are one of the current European carriers that will survive this restructuring.
In this regard I would like to point out a hitherto little noticed aspect of the deal between the SAS Group and Braathens. Whereas the focus has been on the acquisition possibly giving the SAS Group a dominant position in the Norwegian domestic market, the fact that the deal will also yield substantial environmental benefits has been overlooked. The Norwegian media have previously criticized us for flying wing to wing with half-filled planes. Henceforth we will be able to coordinate our efforts, reduce the overcapacity that has existed so far and thus increase efficiency. If SAS Airline and Braathens together successfully achieve the same cabin factor as SAS Airline has historically had on Swedish domestic flights, it will mean considerably lower fuel consumption, less carbon dioxide emissions and major cost savings.

Award-winning environmental reporting
Another positive event in 2001 was that the SAS Group was awarded more distinctions than ever before for its environmental report. The SAS Environmental Report 2000 won first prize for the best environmental report in both Denmark and Norway. In Sweden it received the highest score of all in Deloitte & Touche's annual audit of environmental reports, including the mention: "an environmental report of international top-class." We are also happy to note that Braathens received an honorable mention for its environmental report in the Norwegian competition.
In Sweden, Denmark and Norway the nomination committees, independently of one another, have nominated the SAS Environmental Report 2000 for the European Environmental Reporting Awards. The winner will be announced in April 2002.
The trend is to make increasingly extensive use of the Internet for environmental communication. For the past two years we have published our environmental report on our web site in a dynamic form. On the Internet we have been able to provide readers with more information than what is available in the printed report. This year we are going a step further by publishing the SAS Environmental Report 2001 solely on the Internet. Moreover, SAS's annual report will feature greater integration of environment-related information along with a summary of the environmental report. The reason we chose also to provide more thorough environmental information in our annual report is that we want to give investors and other capital market players an overview of the SAS Group's most important environmental achievements. We have primarily chosen to emphasize the importance of environmental work and environment-related costs for the performance of SAS AB's share price.

Sustainable development
The international trend is also to make "sustainability" reports, i.e. reports describing the company's performance with respect to the three important aspects of sustainable development: economy, environment and social responsibility.
The SAS Group will also gradually go in this direction. We have an impact on both the global and the local community. Consequently, we are required to demonstrate social responsibility, which I believe is a totally legitimate demand. We are expected to behave and act in a manner that contributes toward sustainable development with respect to the economy, environment and community. I believe the events of September 11, 2001 underscore how important it is for not only governments and non-profit organizations, but also businesses, to assume a major responsibility for

creating good societies.
We have started by adopting a sustainability policy for the entire SAS Group. It states that we, i.e. all employees of the SAS Group, shall, in all we do, keep in mind the Group's economic progress as well as its environmental and social impact on society. To ensure that the Group's sustainability policy pervades all levels of the organization, during 2002, all units of the SAS Group will establish relevant goals and strategies for working in line with this policy.

Stockholm, February 2002

Jörgen Lindegaard
President and CEO

A shocked and changed market

Already in April 2001 the first signs of a global recession appeared in the form of a slight reduction in the number of business class travelers. This downswing later took a sudden and dramatic turn for the worse in the wake of the terrorist attacks on September 11.

The travel industry is extremely sensitive to the world situation. Both the airline and the hotel industries are strongly affected by political conflicts, social unrest and environmental disasters. All such factors result in less travel.

Both the airline and the hotel industries are also strongly affected by the price of fuel, electricity, water and waste disposal. Oil prices in particular fluctuate sharply, depending on political factors.

According to estimates by the UN International Civil Aviation Organization (ICAO), passenger and cargo air traffic declined by 6% in 2001 compared with 2000. By comparison, the previous forecast was an increase of approx. 5%. 2001 thus saw the greatest decrease in global airline business since World War II. During the Gulf War, air traffic fell by 3%.

Several airlines, which even before the attack were struggling financially, suffered acute problems resulting in shutdowns and bankruptcies. Many carriers have revised their forecasts, laid off thousands of employees and grounded a large number of aircraft. In SAS Airline's case, 3,500 employees have been given notice and 21 aircraft have been taken out of service, whereas Braathens cut its service by 20%, equivalent to seven aircraft and more than 900 full-time employees.

Discount carriers are among those who have weathered the crisis best. As a rule, they have a totally different operational and cost structure that allows them to break into new markets. For instance, they have been able to lease or purchase used aircraft at low prices. They have also been able to negotiate favorable terms for the use of secondary airports and have also gained access to major airports because traditional airlines have curtailed operations. One example of the competition between secondary airports and major airports is that in early 2002 the media reported that one of the discount airlines paid sensationally low airport charges at Västerås airport. SAS has therefore reported the airport to the Swedish Competition Authority, citing Västerås airport for practicing discriminatory price-setting and allowing taxpayers and other airlines to subsidize the establishment of a discount airline in Västerås.

Discount airlines aim their business primarily at the leisure market, have a limited number of flights, most often from outlying airports, and offer a lower level of service. Consequently, they can keep their costs low. Several of them have in a short time succeeded in building up a relatively large financial base.

The recession has led companies to revise their travel budgets. People are avoiding air travel and many business travelers are now booking cheaper seats or flying on discount airlines whenever possible. For SAS Airline, business travelers flying business class have been financially its most important group of customers. Therefore it has started to tailor its services to the new priorities of this clientele. One of the ways SAS Airline is dealing with its low-fare competition is to offer similar flights with a higher level of service.

Economic upswing by the end of 2002

Many economic analysts and forecasters believe the airline market will start recovering toward the end of 2002. For example, the Swedish Civil Aviation Authority (SCAA) has forecast that the number of air passengers will decline by about 10% during 2002 compared with the year before. The SCAA predicts an upturn toward the end of 2002 – brought about by an economic upswing. SAS shares this view.

SAS has suffered its greatest decline (25%) in the business traveler segment, but believes it is highly unlikely that Scandinavian business travel will remain at this level throughout 2002. Even a small increase in the number of business travelers will have a major impact on results.

Uncertain forecasts

In its study of the civil aviation sector's impact on the global climate, IPCC estimated in 1999 that air traffic would increase by an average 5% per year until 2015. The IPCC estimated that it would be possible to limit the increase of aircraft emissions of carbon dioxide – the most important greenhouse gas – to 3% per year through a gradual changeover to more modern aircraft with more efficient engines and lower fuel consumption.

Like the rest of the airline industry, SAS shares the IPCC view. However, because

of the recession, compounded by the terrorist attacks in 2001, the airline industry now believes the growth curve will fluctuate before rising again once the global economy starts to recover. Till now, traffic growth and economic growth have more or less gone hand in hand.

Index for volume growth and relative fuel consumption
(Diagram not included)

Environmental aspects

The SAS Group's main environmental impact stems from noise as well as energy and fuel consumption. The latter is connected with global environmental problems such as climatic changes and local acidification and eutrophication.
Everything concerning the climate issue is thus of key importance to SAS. True, the connection between greenhouse gas emissions and climate change is the subject of scientific debate, but SAS has chosen to follow a precautionary line by assuming that carbon dioxide emissions do have an impact on global climate.
Since there is a direct correlation between reducing carbon dioxide emissions from aircraft engines and aircrafts fuel consumption, SAS's effort – for economic reasons – to keep fuel consumption low coincides with the environmental aim of minimizing carbon dioxide emissions. Similarly, Rezidor SAS Hospitality has reason to minimize electricity and other energy consumption in every possible way.

Demands and expectations

In pace with deregulation and economic globalization, there is growing demand for major companies in particular to shoulder greater social responsibility. One argument is that among the world's 100 largest economies there are 51 corporations and 49 countries. Another argument is that it is primarily multinational corporations that are the winners from globalization because they can benefit from the system and locate operations in countries or regions with cheap labor and favorable tax policies.
At the same time, there is mistrust among a growing number of people as to the sincere willingness of business and industry to bear greater social responsibility. New national and international organizations have been founded that are highly critical of the globalized economy and multinational corporations.
Environmental and human rights organizations are continuously monitoring corporate behavior. Reports of improprieties spread quickly. A bad reputation concerning environmental impact or social conditions can have immediate and negative consequences for a company's bottom line. Such reports may concern child labor, poor working conditions or other misdeeds. In many cases it is because of subcontractors who have not done their job, but that doesn't matter – the revelation of discrepancies just as often affects the principal contractor.
This is one reason companies require subcontractors to maintain certain environmental, ethical and social standards. The travel industry is also subject to such requirements, including the SAS Group, which is a provider of airline and hotel services.
Moreover, all companies that have introduced a certified environmental management system according to ISO 14001 or are registered with EMAS must see to it that all their subcontractors have an environmental commitment on a par with their own company's ambitions and that they have a system for managing and following up their environmental work.
The number of customers wanting to know how great an impact air cargo or their employees' air travel have on the environment has increased greatly in recent years, in pace with the fact that more and more companies are introducing the environmental management system ISO 14001. SAS has therefore developed a calculation model for emissions, which is posted on the company's website. You can visit this site to have your specific emissions picture calculated.
Some of SAS Airline's major customers have gone so far as to conduct audits to make sure their travel providers live up to the environmental efforts promised in their offers.
One major customer has moreover made an internal environmental and quality ranking of all the travel service companies it uses, i.e. hotels and all transport providers, from airlines to car rental agencies. SAS did well in the ranking.

Sharpened focus on brands

Consumers are increasingly expected not only to look at the product itself, but also what the company behind it stands for. The development and protection of the SAS Group's brands have consequently taken on greater importance for the Group since

it has become more important for companies to share their assessments with their customers and stakeholders.

Sustainable development

The business sector has implemented various measures for meeting outside demands and expectations regarding greater social responsibilty, for instance, by founding organizations such as the World Business Council for Sustainable Development (WBCSD) and by utilizing Global Reporting Initiatives (GRI) guidelines in their environmental reporting.

The mission of the WBCSD, which has 150 member companies, is to make business enterprises aware of their role in sustainable development. In particular, the WBCSD takes up issues such as ecoefficiency, innovations and corporate social responsibility.

The GRI was formed by the United Nations Environment Programme (UNEP) in collaboration with the non-profit organization CERES. The GRI's main task is to draw up guidelines for reporting on the environment-related, economic and social dimensions of efforts by businesses to foster sustainable development, i.e. development that is in keeping with Agenda 21, which was established at the UN Conference on Environment and Development held in Rio de Janerio in 1992.

SAS is following with great interest the work done by the WBCSD as well as the GRI. For example, the ideas behind the WBCSD's ecoefficiency project are reflected in SAS Airline's environmental index. SAS uses the Deloitte & Touche "Checklist for establishing and evaluating voluntary reports." This checklist in turn follows GRI guidelines.

Like its business units and various companies, the SAS Group conducts an ongoing dialogue with various stakeholders. Besides customers, suppliers, politicians and authorities, it has dialogues with environmental and human rights organizations. In these dialogues, SAS raises the issues that are most important to the Group, e.g., by making it clear that fuel consumption and the combustion process in aircraft engines are the most overshadowing environmental problem for SAS.

Global Compact

At the World Economic Forum in Davos in 1999, UN Secretary General Kofi Annan launched the Global Compact – a collaboration between the UN and the business world. The Global Compact includes nine principles for promoting human rights, improving working conditions and protecting the environment.

These principles are based on fundamental international agreements on human and democratic rights, primarily as formulated in a number of UN documents. These were originally intended for countries to follow. However, now that companies have grown so big and influential that their revenues exceed the gross national product of entire countries, it has become increasingly evident that companies, too, must bear a larger social responsibility.

The Global Compact and the GRI have entered into a formal collaboration. Both initiatives are voluntary and complement each other to such an extent that the GRI may be described as a practical expression of what should be included in a company's account of how they are living up to the principles of the Global Compact. Companies can use their involvement in the GRI as an example of their commitment to the Global Compact.

SAS supports the initiative and regards itself as living up to all nine principles, but has so far not taken any active steps to report further details of its efforts to comply with these principles. The nine principles coincide with the SAS Group's sustainability policy as well as the ethical principles expressed in SAS's internal strategy book. This will be revised in 2002.

In early 2002 the Swedish government took the initiative to establish the Swedish equivalent of the UN Global Compact, Globalt Ansvar – Swedish Partnership for Global Responsibility. It is described as a joint effort to encourage Swedish companies to be ambassadors for human rights, acceptable economic conditions and a healthy environment. A number of Swedish companies, SAS included, were asked to participate.

The travel industry and the economy

In the globalized economy the travel industry, and hence the entire SAS Group, is a vital link. By facilitating communication and transport, the industry contributes toward increased value creation for individual businesses as well as for SAS's three home countries. For example, SAS is one of Denmark's biggest employers.

Just how vital civil aviation is to the economy and employment became clear after September 11. During the following two months, between 150,000 and 200,000 jobs disappeared in the global airline industry. That, in turn, is having repercussions in that airlines generate employment in the affected local communities. It is commonly assumed that, by and large, a single airline employee provides jobs for at least two other people in the aviation, tourism and travel industries.

Environmental management report

Due to the recession and the acts of terrorism on September 11, travel dropped precipitously, affecting the entire SAS Group, but particularly the airline business. The crisis has created considerable overcapacity among airlines. At the turn of 2001-2002, between 1,500 and 2,000 of the world's aircraft stood parked on the ground. Several airlines have suffered acute financial difficulties and have either ceased operations or been bought up by competitors.

Environmental impact

The airline business accounts for approx. 86% of the SAS Group's total environmental impact. This impact stems chiefly from the use of fossil fuels, the combustion of which increases atmospheric carbon dioxide, contributing to global climate change. Aviation fuel combustion also emits nitrogen oxides, which contribute to local acidification of soil and water. Aircraft also produce noise, a local environmental problem. Hotel operations and other businesses account for 12% and 2% respectively of the Group's total environmental impact, chiefly because of energy and water consumption, but also through consumption of materials and chemicals as well as waste generation.

Business events

In December 2001 the deal between SAS and the Norwegian airline Braathens was finalized, by which the company is wholly owned by the SAS Group but will continue to operate under the Braathens name.
The deal affords considerable environmental benifits, particularly in the Norwegian domestic market. The merger will help to reduce the overcapacity prevailing till now. If SAS and Braathens in concert achieve a higher cabin factor in Norway, lower fuel consumption, less carbon dioxide emissions and large cost savings will result.
A deal was made in the autumn of 2001 to increase ownership of Spanair from 49% to 74%. Spanair's environmental impact will, however, not be taken in account until 2002.
In 2001 SAS was the subject of intense media scrutiny in Scandinavia. The reports dealt primarily with allegations that safety was being neglected. Although groundless, the reports had to be dealt with. In this instance SAS benefited greatly from having reported on everything openly and honestly in its environmental report, including incidents and less than favorable environmental results. Reporters were quickly provided with the facts, and SAS representatives were more easily able to deal with the criticism.
For detailed information on important events in 2001, see the respective business area or unit.

Organization

A new Group structure and management organization was adopted in May 2001 when the new President and CEO took over. The Group Management (GM) comprises five persons, including the President and CEO.
Since May 2001 Group operations have been grouped into four business areas. Besides GM, there are staff functions and support functions. The latter have also become independent business units and given a mandate for environmental responsibility. Coordination of environmental matters is done by the staff function Government and External Relations (GER). GER is responsible for coordinating all extra-corporate relations, i.e. infrastructure, environment, contacts with authorities and other matters concerning the Group's social responsibilities.
Up to mid-2001 coordination of environmental work and environmental reporting did not take place at the Group level, but was conducted by the respective companies or business units. Consequently, various collection and calculation methods for environmental data were used.
Starting in 2002, however, all environmental work will be coordinated at the Group level and a uniform reporting system will be adopted. This will make it possible in coming years to present aggregate environmental data at the Group level.

Management and follow-up

All units have been directed by Group Management to formulate in 2002 operational goals for their business area's environmental work, based on the new Groupwide sustninatility policy adopted in February 2002. This is supported by an implementation policy and a new environmental policy. Over the coming year the sustninatility

development policy will be complemented with a real-time analysis and a policy on ethics and social responsibility.
SAS's Environmental Index, which currently only covers SAS Airline, became an even more important management tool in 2001 and is reported to GM twice a year.
In 2001, the SAS Group began using a Balanced Scorecard (BSC) in the management of its operations. SAS Airline's management team has introduced an environmental performance indicator in its BSC.

Ethics and social issues
In the autumn of 2001, the Group staff function Government and External Relations, GER, launched a project entitled SAS's Role in Society. The work is being carried out by a broad-based group whose assignment is to define and discuss where SAS stands today, the expectations of the world community and the role SAS plays and should play in society.
SAS's and Maersk Airs' violation of EU competition rules and the heavy fines issued by the European Commission, brought to the fore the need for an ethical discussion in the SAS Group. In the autumn of 2001 the Competition Law Compliance Program was introduced to provide training for affected employees in competition-related issues.

Infringements, incidents and disputes
None of the airlines under the SAS Group umbrella were guilty of any reportable emissions or contamination incidents of significance. No operations were involved in any disputes. On the other hand, there were several violations of local time restrictions or takeoff and approach paths at airports. Air Botnia in particular has often broken Gardermoen's rules that only permit landings of Chapter 2 aircraft between 8 a.m. and 4 p.m.
Rezidor SAS Hospitality's hotel operation Radisson SAS has been cited by the authorities in Düsseldorf for not complying with the city's building and safety codes. This has resulted in a program of action leading to investments worth approximately MDEM 15.
After several cases of Legionnaire's disease, some fatal, legionella bacteria were traced to the ventilation and air-conditioning system at the Radisson SAS Hotel Atlantic in Stavanger. Based on what has come to light so far, the hotel has followed all applicable regulations and maintenance routines. Moreover, the hotel has not been charged, fined or taken to court. In a press release, Radisson SAS made it clear that it intends to take responsibility if it is proved that the hotel is liable for the incident.

Organization and process

A new Group structure and management organization was adopted in May 2001 when the new President and CEO took over. SAS's Group Management (GM) comprises five persons, including the President and CEO. Besides GM, there are staff functions and support functions. The latter have also become independent business units and given additional environmental responsibility.
The SAS Group is now divided into four business areas: SAS Airline, Subsidiary & Affiliated Airlines, Airline Related Business and Rezidor SAS Hospitality.

Basis for the SAS Group's environmental work

Environmental goals and strategies are adopted yearly by SAS's Group Management (GM). Apart from business strategies, their decisions are based on the assessment of the significant environmental aspects of the Group's operations.
The SAS Group has adopted a sustainability policy that sets forth the Group's goals in contributing to sustainable development. All operations will successively be incorporated into this policy. A new environmental policy has also been formulated.

The SAS Group's environmental organization

Environmental matters fall under the staff function Government and External Relations (GER). GER reports to a management group consisting of three persons from GM: Marie Ehrling, Chief Operating Officer and Accountable Manager for SAS Airline; Gunnar Reitan, Chief Financial Officer, and Henry Sténson, Senior Vice President Communications. The latter is head of GER's management and is thus responsible for environmental issues in GM.
GER deals with issues affecting extra-corporate relations, i.e. infrastructure, environment, contacts with authorities, framework conditions for aviation and other matters affecting the SAS Group's social responsibility. The responsibility for environmental issues has thus been broadened and they have assumed their natural place among other matters affecting the Group's relations with the outside world.
Practical responsibility for environmental matters lies with the environmental department at GER. This consists of an environmental director and two environmental advisers, of which one position was added in the autumn of 2001. The environmental department at GER also functions as the environmental staff for SAS Airline.
In addition, there are persons with special responsibility for environmental matters in the Group's various companies and units. In companies where environmental matters are of great strategic importance, these people have environmental matters as their chief responsibility.
Previously the SAS Group's environmental work was coordinated via the SAS Environmental Forum. In 2002 this will be replaced by new formal groups at various levels as well as new groupings of networks focused on environmental issues. These may be the environmental directors at the respective business units, or people involved in purchasing, for example.

Environmental management and follow-up

Environmental work is an integral part of overall management, which is why SAS does not have a separate environmental management system. SAS's environmental work is based on local operation plans in which goals, strategies and activities are decided on the basis of the unit's most significant environmental impact. The local action plans are continually followed up during the year.
SAS's Group Management (GM) receives SAS Airline's Environmental Index every six months. The goal is for this index to be developed to encompass all units in the Group that are important from an environmental standpoint.
Environmental work is followed up annually by the environmental department in conjunction with the compilation of data for the environmental report. Since 1999 this data has been collected in a database that facilitates year-on-year comparisons.
Environment is also part of the internal audits that are regularly conducted, particularly in airline operations. These are done by the national Health, Environment and Safety (HES) departments within the SAS Group.

Internal information and training

Besides the environmental report, information on the SAS Group's environmental work is communicated via in-house publications and the company's intranet. All business units and companies are responsible for ensuring that their respective employees receive the necessary environmental training, based on the needs of the respective employee.

Sustainability policy
In order to contribute to sustainable development, SAS Group employees must take the Group's economic development into account in their daily work as well as its environmental and social impact.
For the SAS Group sustainable development means a parallel focus on financial growth, environmental improvements and social responsibility. The Group's task, based on its core values, is to create long-term growth in value for its shareholders. This requires making environmental and social responsibility as well as respect for cultural diversity an integrated part of business activities. The maintenance and development of employee skills and commitment are of great importance in attaining the Group's goal.

Environmental policy
SAS shall contribute to sustainable development by minimizing its environmental impact and optimizing its consumption of Environmental strategy

Implementation strategy
In order to ensure that the SAS Group's policy to contribute to sustainable develop permeates the entire organization at all levels, each unit will develop relevant goals and strategies in line with this policy.

Environmental strategy
- A methodology is to be drawn up for ensuring that all Group decisions take into account environmental consequences.
- An environmental management system based on the principle of constant improvement is to be introduced.
- A methodology and climate are to be created to guarantee employee interest and commitment to the Groups environmental efforts.
- There is to be an evolving dialog with suppliers to reduce environmental impact.
- A system is to be created for ensuring that the best commercially available technology (EBAT) is utilized.
- Environmental standards are to be developed that are at least on par with our competitors' and that take into consideration applicable laws and regulations.
- SAS is striving for an open and honest dialog regarding its environmental work.

Reporting principles

Ownership and organization

Since July 6, 2001, the SAS Group has been traded as a single share through SAS AB on the Copenhagen, Oslo and Stockholm stock exchanges. The main owners of SAS AB are the Danish, Norwegian and Swedish states, which own 14.3%, 14.3% and 21.4%, respectively, of the shares and voting rights. The remaining 50% of the shares and voting rights are owned by private interests.

- SAS Airline
- Subsidiary & Affiliated Airlines
- Airline Related Businesses
- Rezidor SAS Hospitality

As stated below uniform reporting principles for reporting environmental data could not be applied to all Group companies in the environmental report for 2001. The differences will be attended to in 2002.
SAS's ambition for the environmental report, the summary of the environmental report in the SAS Group's annual report for 2001 and other environmentally related information in the annual report, is to include all significant factors required to provide readers with an accurate picture of SAS's environmental impact and its commercial consequences.
In accordance with generally accepted accounting practices, SAS also reports significant events occurring after the end of the financial year and before completion of the environmental report.

Reporting principles

The SAS Environmental Report 2001 includes reporting of information on significant environmental effects from all subsidiaries in the four business areas. Because the company did not apply common calculation methods and reporting principles in 2001 it has not been possible in this year's environmental report to report aggregate environmental data at the Group level.
Nor has it been possible to report environmental data for all units in the Group because of the lack of a uniform Group-wide data collection system for environmental data. The SAS Environmental Report 2001 is therefore limited to environmental data at the company level and at the business unit level for the business units SAS Airline and Rezidor SAS Hospitality. A uniform Groupwide system for environmental management and environmental reporting will be introduced in 2002 and SAS's ambition is to apply uniform calculation methods and reporting principles in future reports.

Division of environmental data between the annual report and the environmental report

The SAS Group's annual report for 2001 provides a general account of the Group's environmental status pursuant to Swedish legislation regarding disclosure of environmental information in the board of directors' report. In addition to this, environmental information has been integrated into the annual report where appropriate in order to provide a more complete picture of operations.
This year a summary of the environmental report has been included in the annual report. The idea is to provide investors and other equity market actors with a relatively comprehensive and easily accessible overview of SAS's most important environmental performance, in close proximity to the other information in the annual report. SAS's primary aim in the summary is to point out the impact of environmental work and environmentally related costs on the value of SAS shares. The complete report of SAS's environmental work and achievements in 2001 is presented in this environmental report.
The principles applied for reporting financially related information in SAS's environmental report for 2001 are identical to those used in the SAS Group's annual report.
In certain cases, data referring to the same area differs between the environmental and annual reports. The differences, which primarily refer to production and traffic data, are attributable to the fact that the reports have different operational boundaries.
In cases of divergence from the specified boundaries for reporting of environmental data, information about the deviation is provided in direct connection with the relevant data, table or chart.
Although SAS's environmental report is published in Danish, Norwegian, Swedish and English, the Swedish version is regarded to be the original.
The board of directors' report in the SAS Group's annual report was approved by

the Board of Directors of SAS on March 13, 2002. At the same time the Board studied the summary of the environmental report and other environmentally related information included in the annual report. The detailed environmental information in this report has been approved by the SAS Group Management but has not been examined by the Board.

Changed reporting and calculation principles

The following changes have been made in reporting and calculation methods compared with previous years:

- The term SAS in this report refers to the SAS Group.
- Beginning this year SAS is using new and more stringent definitions of the external environmental costs paid by the Group. The reported environmental costs in this year's environmental report are based on the new definitions described below. Costs from previous years have been recalculated on the basis of the new definitions.
- The SAS Environmental Report 2001 covers the entire SAS Group, with, however, the limitations that ensue from the fact that a uniform calculation and reporting system is lacking, while previous annual reports mainly provided accounts for SAS Airline and some of the companies now included under Airline Related Businesses.

Calculation principles for SAS Airline

Reported environmental information for SAS Airline 2001 is based on the following coefficients and calculation principles.

Coefficients:

- The formula for distance flown used in calculation of the production ratios ATK, RTK, ASK and RPK is based on the distance between SAS's destinations, expressed as the great circle distance (GCD), the shortest distance between two points, multiplied by the number of flights between them. But since the flight distance increases when aircraft are stuck in holding patterns and the flight path does not always follow the shortest distance between the two points, the actual distance flown is approx. 10% longer than GCD.
- Calculation of RTK is based on the weight of paid cargo, the number of paying passengers and the average passenger weight including baggage. The following standard weights have been used in SAS's environmental report for 2001:

– Standard weight, intercontinental routes: 99 kg
– Standard weight, European routes: 97 kg
– Standard weight, domestic routes: 95 kg

The following coefficients have been used:

- Weight of 1 liter jet fuel: 0.79 kg
- Emissions of CO_2: 3.15 kg per kg jet fuel burned
- Emissions of SO_2: 1 g per kg jet fuel burned
- Emissions of NOx: 55.2 g per km flown[1]
- Emissions of HC, excluding VOCs: 5.6 g per km flown[1]
- Emissions of water vapor: 1.238 kg per kg jet fuel burned
- 1 kg LPG: 12.8 kWh
- 1 kg fuel oil: 12.0 kWh, 3.17 kg CO_2, 5 g NOx, 0.9% SO_2
- Average density of solvents: 0.8 kg/l

The calculations are based on 365 days per year.

[1] *Factors that are specific to each airline based on the composition and patterns of operation in the aircraft fleet.*

Calculation of environmental index for SAS Airline

The overall environmental index for SAS Airline is a weighted average of the indexes for the three areas of operations: flight, cabin and ground. The index is a method for describing SAS Airline's overall ecoefficiency.

The following weightings have been used:

- Flight operations: 90%
- Cabin operations: 5%
- Ground operations: 5%

Flight operations account for the bulk of SAS Airline's environmental impact and have therefore been given the preponderance of the weighting. Flight operations are responsible for an estimated 90% of the total impact of reported operations. The remaining 10% is divided equally between cabin and ground operations. Calculation of the respective operation's share of SAS Airline's environmental impact was done by assigning specific costs to the different types of environmental effects of the various operations and then obtaining a weighting corresponding to the share of the total costs for the respective operation.
The environmental index (ecoefficiency) for the areas of operation is calculated in two steps:

$$\text{Environmental impact} = a \times \frac{\text{Variable 1}_{\text{current year}}}{\text{Variable 1}_{\text{base year}}} \ldots + n \times \frac{\text{Variable Z}_{\text{current year}}}{\text{Variable Z}_{\text{base year}}}$$

Where a...n is the assigned weighting (see below) and 1...Z is the significant environmental aspect in question.

$$\text{Environmental index} = \text{Environmental impact} \times \frac{\text{Production}_{\text{base year}}}{\text{Production}_{\text{current year}}}$$

The lower the value, the lower the environmental impact per unit produced.

Flight operations
Environmental aspect Weighting Production factor
- Carbon dioxide 50% Revenue tonne kilometres (RTK)
- Nitrogen oxides 40%
- Weighted noise contour 10%

The high weightings for carbon dioxide and nitrogen oxides are based on the scientific findings summarized in the IPCC report on aviation and the global atmosphere.

Cabin operations
Environmental aspect Weighting Production factor
- Unsorted waste 50% No. of meals produced
- Energy consumption 30%
- Water consumption 20%

The weighting for unsorted waste is based on the fact that waste volumes affect the total load weight of a flight and therefore also fuel consumption. The weighting for energy consumption is based on an average electricity mix in Scandinavia, with a large proportion of hydropower relative to the rest of Europe. The weighting for water consumption is also based on conditions in Scandinavia, where the supply of water is comparatively good.

Ground operations
Environmental aspect Weighting Production factor
- Energy consumption 40% Weighted landings
- Fuel for ground vehicles 20%
- Glycol consumption 20%
- Unsorted waste 10%
- Hazardous waste 5%
- Water consumption 5%

Energy consumption has been given the highest weighting, since SAS is a major consumer of electricity. Consumption of glycol and fuel for ground vehicles has been given relatively high weightings since they give rise to direct emissions into the environment.

Terms and definitions
Weighted noise contour
The weighted noise contour is calculated based on the number of takeoffs per day at a given airport, with regard to the aircraft types the airline uses at that airport. The weighted noise contour defines the area in km^2 that is subjected to a noise footprint of 85 dB(A) or more in connection with takeoff.

Revenue passengers
Passengers who pay at least 25% of the regular ticket price.

Adjustment for volume growth

The change in the absolute value of a specific parameter, from year to year is assumed to be attributable partly to a change in the operating volume and partly to improved technology or a change in efficiency, etc. In this environmental report, "Adjustment for volume growth" means that the effects of the increased operating volume have been eliminated. This is done by adjusting the preceding year's figures by an amount equal to volume growth. The change in the parameter in question is then calculated.

Charges for the infrastructure
Charges imposed by the operators of the infrastructure and which are intended to cover operating and capital costs for airlines and air traffic management.

Environmental charges
Charges intended to cover the direct costs of environmental measures relating to airports such as the cost of noise measurement, noise measurement systems and noise protection measures including expropriation of surrounding buildings due to noise (Polluter Pays Principle). Environmental charges are normally related to the environmental properties of the aircraft. In certain cases, the charge is assessed as a passenger charge (not related to the noise source).

Environmentally related charges
Charges imposed by the airport operators for the purpose of motivating aircraft operators to operate aircraft with good ecoefficiencies with respect to noise and other emissions such as of NOx and HC as well as surcharges imposed by airport operators to motivate aircraft operators to avoid takeoffs and landings at night. Environmentally related charges are included in airport revenues and not linked to any direct cost.
The methods for classifying aircraft differ between countries as well as airports within countries. Although the charges are differentiated based on the ecoefficiency of the aircraft, all in all they are balanced out in such a way as to defray some of the costs determined by the airport operator.

Environmentally related taxes
Taxes which in contrast to other corporate taxation are motivated by environmental grounds, such as the environmentally motivated passenger charge in Denmark and Norway, the environmentally related fiscal carbon tax in Norway and certain energy taxes in Denmark.

External environmentally related costs
The sum of environmental charges and environmentally related charges and taxes.

Other environmentally related costs
Costs for waste management, purification plants, permits, any fines and charges for permit deviation, costs for remediation measures, etc. as well as internal reported costs for environmental work, e.g. costs for persons and organizations working with environmental protection, costs for environmental reporting etc.

Environmentally related investments
Investments in assets to prevent, reduce or correct environmental damage arising from operations that are not profitable on their own financial merits or are aimed at meeting upcoming, more stringent environmental requirements

Environmentally related provisions
Provisions for liabilities and allocations for known undertakings and requisite measures to prevent, reduce or correct environmental damage arising from operations.

Environmentally related contingent liabilities
Contingent liabilities pertaining to possible future costs for measures to prevent, reduce or correct environmental damage arising from operations.

Environmental impact of leased aircraft
Except for shipments of goods by other carriers on SAS Cargo's account, fuel consumption and emissions from leased aircraft and aircraft leased including the crew (wet lease) are included in the reported data for SAS Airline.
CFROI

EBITDAR in relation to AV.

EBITDAR
Earnings before depreciation and leasing costs. Earnings before net financial items, taxes, depreciation, share of income in affiliated companies, income from the sale of fixed assets and leasing costs for aircraft.

AV
Asset value (adjusted capital employed). Book shareholders' equity, plus minority interests, plus surplus value in the aircraft fleet, plus 7 times the yearly operating lease costs for aircraft, plus net interest-bearing liabilities, less equity in affiliated companies. Can also be expressed as the total book value of assets, plus surplus value in the aircraft fleet, plus 7 times the yearly operating lease costs for aircraft, less equity in affiliated companies, less noninterest-bearing liabilities and interestbearing assets.

EV
Enterprise Value. Average share price (market value of shareholders' equity) with the addition of average net liabilities during the year and 7 times the yearly operating lease costs for aircraft.

Quality assurance
Specially appointed persons at the major units in the Group are responsible for providing environmental data for SAS's environmental report. The environmental adviser is responsible for entering the reported data into a Group-wide database at the central environmental department. In conjunction with this the data is evaluated, analyzed and compared with data in the database from previous years. Before new data goes into the database, the underlying information is examined.
SAS's external auditors examine the materiality of the information in the database against the underlying documentation and assess whether, on the basis of the underlying data, interviews with managers and a review of documents, systems and routines, the information in the environmental report provides an essentially accurate picture. The scope of the auditors' review is described in more detail in their statement.

This is SAS Airline

SAS Airline comprises SAS' passenger transport operations with its own aircraft and under and under its own brand. The business area includes the production company SAS Commuter and the independent business units Scandinavian Ground Services and Scandinavian Technical Services. Scandinavian Ground Services is responsible for SAS passenger and ramp services at all airports. Scandinavian Technical Services is responsible for the technical maintenance of SAS Airlines and other customers' aircraft fleets. SAS Airline was one of the founders of Star Alliance, a global network of airlines, in 1997. In addition to this, SAS Airline has a number of European partners.

Highlights of 2001

- SAS Airline's Environmental Index improves by 2 points, to 80
- Total production increased by 5.1%.
- Modernization of aircraft fleet continued through the delivery of 24 new highly ecoefficient aircraft.
- SAS Airline's external environmentally related costs increased by 12% as the result of higher environmentally related taxes.
- The ongoing program for energy conservation led to a 2.4% decrease in energy use by SAS Airline's ground operations.
- SAS Airline's environmental work made a positive contribution to the SAS Group's overall image index.
- No environmentally related costs of significance due to accidents incidents, infringement's of environmental laws, contaminated proporties, disputes or complaints.

A word from the Environmental Director

Crisis may be a blessing in disguise

2001 ended as SAS's worst year ever – in every respect, financially not excepted. This has forced us throughout the Group to become thriftier with resources than ever before. Handled correctly, however, the new conditions may help us to hone our creativity and efficiency.

The most visible result of this is that we are printing and distributing as part of the annual report only a summary of the actual environmental report. Another new approach is that owing to the new Group structure, we are covering the SAS Group's environmental work overall and not just that of SAS Airline alone, even though the activities of SAS Airline are still responsible for the bulk of the Group's environmental impact. However, this year we are unable to report aggregate environmental data at the Group level, since the data collected from the various business areas, companies and units, is not comparable. It will be so in coming years. This will be possible because in order to increase the efficiency of our overall environmental efforts we have commenced the development and adoption of an environmental management and reporting system covering the entire corporation.

We have long worked on developing our environmental communication on the Internet. Last year we presented an expanded dynamic version of our environmental report on our website. This year we are going a step further, posting the environmental report solely on our website. Although we believe that is this the right move, depending on the reactions of our readers and stakeholders, we are prepared to reconsider our decision.

We are consequently extra eager to receive feedback – criticism or suggestions for improvement. We invite you to send your reactions by completing our survey.

Unfortunately we must recognize that the crisis, which, to be sure, we saw the outline of in advance, but which hit with full force after September 11, has meant that we attained a somewhat worse environmental result that what we had good reason to hope for before then.

Positive final environmental result

However, I would like to point out that the final environmental result was still positive in that the environmental index improved by two points compared with 2000. Our goal is to achieve an average improvement of 3 points per year in the period from 1996 till 2004. Between 1996 and 2001 the index has improved 20 points, an average of four points per year.

Despite all, we have reasons to be proud. One is that our SAS Environmental Report 2000 won the award for the best environmental report in both Norway and Denmark. In Sweden it got the highest marks of all in the review of voluntary reports that Deloitte & Touche did along with the Swedish Institute of Business Administration and the weekly magazine *Affärsvärlden*. The nomination committees in all three Scandinavian countries have nominated the SAS Environmental Report 2000 to compete in the European Environmental Reporting Awards, to be presented in April 2002 in Copenhagen.

Our success with the environmental report has also drawn attention to our environmental efforts. We have noted that we are increasingly being invited to give talks and take part in discussions in the Nordic region as well as elsewhere in Europe that deal with the airline industry and the environment or with environmental reporting. In the latter case, there is great interest in our efforts to develop our environmental index and our environmental performance indicators.

Continuous improvement

SAS has outside auditors examine its environmental report to assess whether it gives a true picture of SAS's environmental work and ecoefficiency. As part of this we are in a continuing dialogue with the auditors, who point out any shortcomings or question whether reasoning and analyses agree with the figures being examined. The review by auditors also provides a basis for improvements of our internal collection process and presentation of environmental data.

Since our stated goal for all our operations, including the environmental report, is to show continuons improvement, we usually listen attentively to our auditors' criticisms. One of our responses to these this year is our further efforts to highlight the link between the Group's environmental work and its financial performance.

During 2001 SAS's in-house auditors examined both the environmental reporting process and the outside audit of the environmental report. They were satisfied

with our work and only had a few minor remarks, which we now have attended to. For several years we have tried to interest our competitors and our partners in Star Alliance in using the key performance indicators that we have developed. This was to better enable us, our customers and other stakeholders, to compare various carriers' ecoefficiency. We have made a little headway, particularly with some of our competitors. However discussions are on hold because of the recession and consequences of the act of terrorism, which have forced airlines to muster their resources for safety issues and cost-efficiency, to adapt to altered market assumptions. I am convinced that these efforts will be resumed once the situation in the air travel market has stabilized. This also applies to the environmental cooperation within Star Alliance that came to a halt after September 11.
Returning to happier news, I would like to mention that our environmental index has become an increasingly vital management tool at SAS. It is now being reported to Group Management twice a year. From now on, parts of the Environmental Index will also be used on the Balanced Scorecards utilized in the management of flight operations at SAS Airline. Thus, the environment will become an even more distinct factor in the decision-making process at SAS from here on out.

Oslo, February 2002

Niels Eirik Nertun
Environmental Director

SAS Airline and the world around us

The economic slowdown and the terrorist attacks of 11 September have led to what we have judged to be a temporary stagnation of the airline market. The slowdown has resulted in a change in travel habits and greater cost awareness, which has benefited the discount airlines and forced traditional carriers such as SAS Airline to reassess the services they offer to their customers.

Demands and expectations

In pace with the rapid globalization of the business sector, an increasing number of individuals and organizations are demanding that businesses shoulder a greater degree of social responsibility. Businesses are also increasingly requiring that their subcontractors achieve certain standards for environmental performance, ethics and social responsibility.

The Airline industry and the economy

Besides the fact that the airline industry is of vital importance both to individual companies and the overall economy, as well as employment, it also contributes to improving the quality of life in a number of other ways. For example, the airline industry enables increased social interaction, helps keep divided families together and offers the capacity to rapidly deliver emergency supplies in the event of accidents and natural disasters.

As an example of the economic aspects of the advantages to society offered by the airline industry, we can mention the rapidly increasing utilization of air transportation for the new economy's knowledge-intensive products. The value of these products is often high, and a systematic changeover is occurring from rail and sea transport to road and air transport in accordance with the rising specific value of products. For very expensive products, valuable spare parts, organ transportation, life saving medical equipment or fresh produce, it is the delivery speed and precision that is of decisive importance to the choice of a mode of transportation for longer distances. This means that air transportation is often chosen.

Companies often operate in many different counties as a result of the global economy. This leads in turn to an increased demand for travel, especially air travel. The economic slowdown in 2001 and the terrorist attacks showed, however, that the willingness to fly can decline rapidly in the event of economic or political unrest.

IT tends to increase the demand for air travel

The rapid evolution of information technology is influencing the airline business and people's travel patterns. IT increases the opportunities for building both private and commercial networks. It has become easier to work in real-time global networks and to sell products and services over the Internet. E-commerce, and business-to-business commerce especially, has simplified commerce over long distances, and this has in turn increased the demand for rapid transportation in particular. A great deal of travel and meetings between people have indeed been replaced by telecommunication, which may also entail potential environmental benefits, but there is no evidence that telecommunication will yield any overall reduction in air travel.

Studies show that errands of a more trivial nature, such as bank errands or more routine contact, are being replaced by telecommunication. The need for face-toface meetings in the creative area, such as research and development, marketing and design is increasing at the same time. Creative and intellectual processes that involve argumentation or negotiation demand physical contact, and IT is inadequate as a tool in these cases.

This is supported by a study of the relationship between the utilization of information technology and passenger transportation conducted by George Mason University outside Washington, D.C. It shows that passenger transportation declines proportionate to the increase in IT utilization, but only in regions with low-tech businesses. Passenger transportation, and air travel in particular, increases on the other hand within and to and from communities with high-tech businesses.

A report from the University of Karlsruhe in Germany indicates that the Internet in general may lead to a higher demand for travel and transportation. It points out that

chat friends will want to meet in person sooner or later, that individuals surfing the Internet for tourist destinations will decide eventually to travel to these destinations, and that anyone who has learned how to find good prices for a product via the Internet will continue to make purchases on the Internet. This results in an overall higher demand for transportation, especially air transportation.
Today, information technology is fully integrated into the airline business, encompassing everything from ticket reservations to air traffic control. It has also contributed to the birth of a whole new market, discount airlines, which has grown dramatically in recent years, without stealing market shares from the traditional airlines for a long time. Discount airlines sell up to 95% of their tickets via the Internet. This allows them to keep their costs and prices down and to maintain acceptable profitability at the same time. Ticket sales over the Internet by traditional airlines such as SAS are increasing, but sales made in person still predominate.

Scandinavian airlines pay their own social costs
The Scandinavian airlines bear, in addition to their own infrastructure costs, the cost of any social or environmental damage they cause. This was the conclusion of the consultant report "The Conditions for Civil Aviation in Scandinavia", which was published in the spring of 1999. The Danish consulting firm COWI conducted a comparative study in association with the Norwegian Institute of Transport Economics and the Swedish firm InRegia, on behalf of SAS.
Its findings were confirmed by a Norwegian research report from 2000 for a study conducted by the Norwegian Institute of Transport Economics at the request of the Norwegian ministries of communications and of fisheries and the Directorate of Roads.
The report compares the different transportation sectors' impact on society in the form of environmental pollution, noise, accidents, traffic congestion, and infra-structure damage. This impact is then contrasted with the taxes and charges paid by the respective sectors.
Its conclusion is that civil aviation, in addition to passenger vehicles, is the only transportation sector that pays for more than its share of the damage it has caused to society – to be precise, civil aviation has paid twice as much in taxes and charges as the costs it has caused to Scandinavian societies.
The rail, bus and streetcar sectors, on the other hand, only pay 10% of their costs to society according to the Norwegian Institute of Transport Economics. If the subsidies received by these transportation sectors were taken into account, then this percentage would be even lower.
The report from the Institute of Transport Economics was the basis for the Norwegian parliament's decision on a new national transportation plan. It may perhaps have contributed to the Norwegian parliament's decision to eliminate the Norwegian passenger tax as of April 1, 2002.
SAS Airlane would like to see a new study after the new law has been in force for a few years to determine whether there is any better correspondence between the airline industry's environmental and social costs and what it pays in taxes, charges and levies.

Policies, laws and regulations
The airline industry is regulated primarily by international agreements made within the framework of the International Civil Aviation Organization (ICAO). These deal with standards for noise and emissions of nitrogen oxides, for example.
Within the ICAO, which is made up of representatives of countries, unanimous decisions are required. Government representatives, primarily from developing countries and North America – the U.S. in particular – have usually sought to block mandating tightened environmental standards for aircraft, whereas representatives of EU member states have promoted such tightening.
Since the lowest common denominator has normally prevailed, EU representatives usually feel that the result of the negotiations is watered down and toothless.
For example, this applies to the new noise standard the ICAO adopted in 2001.
Besides international agreements there are various national or local regulations.
These may be noise restrictions for takeoff and landing or special systems of environmentally

related charges.

According to an ICAO policy from the beginning of the 1950s, aviation fuel is untaxed, an arrangement under serious reconsideration, especially in Europe. There the European Commission, as well as many individual countries, environmental organizations as well as EU parliamentarians, propose levying a carbon or fuel tax on aviation fuel. In Denmark as well as Norway, civil aviation pays green taxes and passenger charges. The Commission has stressed its preference for a global tax solution for aviation fuel, so as not to harm the competitiveness of EU-based carriers. This explains why the EU is actively pushing for economic management tools within the ICAO.

Environmental charges and environmentally related charges

For that matter, airlines are not exempt from environmental charges, but these are levied on things other than specifically fuel. There are a variety of environmental charges and environmentally related charges, in Europe especially. There, airports either imposed special environmental charges or have some of the main charges – normally the landing fee – vary according to the environmental characteristics of the aircraft taking off or landing. However, environmentally related charges need not correspond to any particular costs, but have been created to encourage airlines to fly the most ecoefficient aircraft.

One problem is that airports use different models for landing fees. For carriers this means that the same aircraft may be considered "best in class" one place, but end up in a worse category somewhere else. This makes it difficult for SAS Airline to make optimum use of its fleet in the way it would prefer.

The European Civil Aviation Conference (ECAC) ran a project aimed at creating a European model for emission charges. The project, designated ERLIG, has recently concluded and has prompted a great deal of interest. Its result suggests that in the future, countries in addition to Sweden and Switzerland will impose emissionsbased landing charges, with Germany and the U.K. showing the greatest interest.

The Swedish Civil Aviation Authority was a driving force on the ERLIG project, which also supported by the EU.

Noise

Noise is an environmental problem that has attracted increasing attention. Airports in densely populated areas in Europe and North America are therefore imposing noise charges, takeoff and landing restrictions, or banning the noisiest aircraft.

The UN International Civil Aviation Organization (ICAO), has devised a certification system that classifies aircraft according the noise they generate. There are four classes: uncertified, Chapter 2, Chapter 3 and Chapter 4 aircraft. All new aircraft types manufactured after April 1, 2006, must meet Chapter 4 standards. This means that they must have noise profile 10 EPNdB lower than that for Chapter 3 aircraft, which is the strictest current standard.

The EU and individual countries in Europe have long urged the ICAO to tighten noise certification standards, which they also did when the ICAO Assembly met in September 2001. Nevertheless, no plan was introduced to phase out the noisiest aircraft, a plan that representatives of the EU countries have long fought to pass.

The ICAO Assembly agreed on a compromise advocating a "balanced approach." Instead of a general ban on certain types of aircraft, four different tools were presented that may be utilized to improve the noise situation at particularly vulnerable airports. The tools the ICAO refers to are land use restrictions, takeoff procedures, operating restrictions such as prohibiting certain types of aircraft or hushkitting at the source, i.e. technical solutions for the affected aircraft.

The ICAO recommends that airports ameliorate their noise situations by applying the tool or tools proving most effective from a "cost-benefit" standpoint, i.e., providing the most noise improvement at the lowest overall cost.

A general perception of the ICAO agreement is that it is watered down and rather vaguely written. This has given the EU certain maneuvering room to go ahead and devise stricter noise regulations that those applying in the rest of the world.

The EU adopts new aircraft noise directive

Since 1999 the EU has had a regulation intended to ban Chapter 2 aircraft from operating beginning on April 1, 2002. This regulation is now also part of national regulations. A new directive, the so-called Hushkit Directive was also to apply to registration of hushkitted Chapter 3 aircraft, that is, of Chapter 2 aircraft whose engines have been hushkitted to allow them to be re-certified as Chapter 3.

The U.S. has regarded this regulation as a trade barrier. The Americans have threatened to take severe countermeasures if the EU should actually apply this regulation. Therefore the new ICAO agreement came at an opportune moment for the EU, which in record time translated it into a new EU directive on aircraft noise, which is to replace the Hushkit Directive the U.S. criticized so much. The EU noise directive is planned to come into force on April 1, 2002.

The new noise directive means that airport operators or authorities that determine rules for airports have a certain frame around which they can impose operating restrictions on aircraft with certain noise profiles. In practice this may mean that it will be possible to ban hushkitted Chapter 3 aircraft or set deadlines for operating aircraft that generate more noise than Chapter 3 standards, minus 5 EPNdB.

This directive will affect older Boeing 747s and DC 10s, aircraft still in active service in Europe. However, neither SAS Airline nor the carriers in the SAS Group have such aircraft in their fleets.

There is, however, a formulation in the directive that may eventually affect SAS Airline. The gist of it is that in the course of five years, the EU is going to evaluate the result of the directive and decide whether it should be tightened further. Should there be any tightening, the two MD-83s that SAS Airline has in its fleet may end up exceeding the new noise threshold. It is relevant to point out that there are some EU member states that have advocated increasing the Chapter 3 margin of 5 EPNdb to 8 or even more.

At the same time it should be pointed out that SAS Airline is currently in a stimulating dialogue with aircraft and engine manufacturers to find solutions to reduce the noise from engines on existing aircraft.

Congestion in the air and on the ground

The constantly growing air traffic is creating problems. There is dearth of capacity at many major airports, above all in Europe and North America. The recession and the act of terrorism on September 11 have only temporarily relieved the pressure.

And so the problems of congested airspace and delays remain. A report from Eurocontrol, the European air traffic management organization, reveals dramatic future capacity problems at European airports. According to Eurocontrol, within a period of ten years, there will be a lack of resources to accommodate up to 30% of required air traffic.

Because the aircraft will have to spend unnecessary time in holding patterns, the result will be substantially increased fuel consumption. Fuel consumption will also increase because aircraft also often speed up to make up for delays that arise from not being able to take off on time.

One of SAS Airline’s partners in Star Alliance, German Lufthansa, has calculated that the delays affecting the airline due to lack of airport capacity mean approx. 100,000 tonnes extra fuel consumption per year, corresponding to just over 300,000 tonnes of carbon dioxide, 50,000 tonnes extra fuel are consumed while in holding patterns, and 50,000 tonnes of fuel when aircraft make up lost time. Lufthansa reports that it loses MSEK 4.85 per day on delays, 60% of which are due to infrastructure bottlenecks and a shortfall of air traffic control capacity.

In this regard, SAS Airline is fortunate compared with its European rivals. In its Scandinavian home market the aviation infrastructure is well developed and the airports in Copenhagen, Oslo and Stockholm rank generally very favorably in statistics of delays.

A lack of land and proximity to residential areas makes expansion of existing major airports difficult or impossible. For instance, if plans are realized, Paris’s new international airport will be built a whopping 120 kilometers outside the city.

Already limits have been imposed on takeoffs and landings at major airports located near European cities, often involving a total ban on nighttime takeoffs and landings.

It also happens that airports are approaching their ceilings for harmful emissions into the environment. So far this primarily applies to Arlanda, one of SAS Airline's home bases. There the total emissions of nitrogen oxides and carbon dioxide are not permitted to exceed 1990s levels when the third runway comes into service, planned to happen in spring 2002. The ceiling applies to all sources of emission in the area, not just air, but road and rail transportation as well. Road transportation and aviation are responsible for emissions of carbon dioxide and nitrogen oxides in equal measure. The Swedish Civil Aviation Authority, which fears that the emissions target will not be met, has petitioned the government for a new ceiling.
In Sweden, as in parts of the rest of Europe, especially in the U.K., there is a noticeable trend toward establishing secondary airports. These are often military airfields otherwise threatened with closure or smaller private airports located at some distance from population centers. With promises of lower charges, they naturally attract cargo or charter service or other discount carriers.
SAS Airline is attempting to deal with the problems of congestion and capacity shortages at European airports by purchasing new, larger aircraft. They have been ordered to meet new, stricter noise regulations and also have the lowest carbon dioxide emissions in their class.

Problems with air traffic control
Several carriers, including SAS Airline, have invested in technology that will make it possible to reduce current limits for the shortest permissible distance between aircraft in the air. However, it cannot be exploited in full, because the technology at airports on the Continent is not sufficiently up-to-date. And according to a study by the UN Intergovernmental Panel on Climate Change (IPCC) of the aviation sector's impact on global climate, more efficient air traffic control might also reduce fuel consumption by between 10% and 18%.
Another problem is that European air traffic control is not sufficiently coordinated. Just the fact that there are 49 different air traffic control centers, 31 national systems and that a total of 30 programming languages are used creates coordination problems.
So far, all attempts to discuss joint regulation of European airspace have met with opposition. One reason is interest clashes between civil and military aviation, but another is that, despite EU membership, many countries are defending the sovereignty of their own airspace.
The EU Commissioner for Transport and Energy Loyola de Palacio, has drawn attention to the problem by appointing a working group tasked with dealing with the problem of delays, for example. Eurocontrol has also lately begun to discuss environmental issues somewhat more actively, seeing them in part in relation to congestion and delays.

Climate issue control for aircraft
Aviation's single biggest environmental impact is emissions of the greenhouse gas carbon dioxide. To be sure, the link between greenhouse gas emissions and climate change is the subject of scientific debate. Nevertheless, SAS has chosen to follow the principle of prudence and assumes that carbon dioxide emissions do impact global climate. It is therefore the utmost priority for SAS to minimize such emissions. Since there is a direct connection between reducing carbon dioxide emissions from aircraft engines and reducing aircraft fuel consumption, SAS's efforts to hold down – for economic reasons – fuel consumption, coincide with the environmental aim of minimizing carbon dioxide emissions.

Water vapor
Water vapor has a greenhouse effect. Whereas aviation's contribution to the total water balance in the troposphere is negligible, its stratospheric emissions have an impact on climate – though to a considerably lesser extent than what emissions of nitrogen oxides and carbon dioxide do. Aircraft vapor trails cover over on average 0.1% of the Earth's surface. Such contrails have two opposite effects on climate. While contributing to cooling by blocking incoming solar radiation, they also contribute to the

greenhouse effect by absorbing heat radiated outward. The net effect is slight.

The UN Convention on Climate Change
The object of the 1992 UN Convention on Climate Change, which in 1997 led to the so-called Kyoto Protocol, is for all industrialized countries to lower their emissions of greenhouse gases to 95% of 1990-levels by 2012.
This target is the result of a political compromise. In actual fact, according to the Intergovernmental Panel on Climate Change (IPCC), emissions must eventually be reduced by considerably more than that to keep the global damage due to climate change at a manageable level. Several countries, including Sweden, have declared their intention to go beyond what is required by the Kyoto Protocol.
The transportation sector is often the focus of discussions of climate impact, for obvious reasons, since it primarily utilizes fossil fuels. At the same time, the global transportation sector accounts for no more than 16% of aggregate carbon dioxide emissions. Nearly half comes from manufacturing and energy production, with 21% and 25% respectively. Of the transportation sector's 16%, road traffic accounts for 75%, ocean shipping 7%, railways and inland shipping 6% and aviation for 12%.

The Kyoto Protocol
During 2001 there were political discussions and negotiations among the parties to the climate convention. Afterward, at the UN climate conference COP7 in Marrakech in November 2001, they came to an agreement on the details of the Kyoto Protocol that sufficed to enable efforts to ratify the Protocol to get started.
The parties reached an accord on principles for and the scope of the three socalled mechanisms in the protocol, emissions trading, joint implementation and clean development mechanisms. They also agreed on a "rule book" for the Kyoto Protocol, which defines, for example, how and in what units greenhouse gas emissions are to be measured and how so-called carbon sinks are to be calculated.
Thus, the parties can begin to ratify the Protocol, expected to come into force during 2002, assuming that at least 55 countries have approved it. Although the U.S., under President George W. Bush, has stated its intention not to ratify the Kyoto Protocol, it can enter into force with America's participation.

Emissions trading
Emissions trading, also called quota trading, is the mechanism that will most obviously affect the business sector and the airline industry. The idea is that those countries that emit less carbon dioxide than permitted under the Protocol should be able to sell their unused quotas to another country. In fact it will be companies or other enterprises in the respective countries that will trade quotas, meaning that the SAS Group will be able to purchase emissions rights as needed. In the section "Environment and economy" there is a diagram explaining the impact on results connected with various price levels of emissions rights.
Initially, trading will take place within and among the industrial countries that under the Protocol are required to reduce their emissions. There is also a possibility of indirect trading with developing countries, through the "clean development mechanism."
The trading system as a whole will come to resemble traditional share trading. It will be each country's responsibility to keep track of all its quotas. The national registers, which are yet to be created, may be likened to central securities depositories, which record purchases, sales and holdings of shares, etc.
A central register will be established within the framework of the UN Convention on Climate Change to make sure that each country meets its commitment under the Kyoto Protocol.
Due to the great interest in quota trading, for several years now, a number of pilot projects have been ongoing. The World Bank manages something called the Prototype Carbon Fund (PCF), in order to develop quota trading between industrial and developing countries.
Denmark has introduced a trading system for electric power companies. In the U.K. a voluntary system is being started for emissions trading during 2002. Norway is also developing a quota trading system, which in all probability will also include the

transportation sector. The Norwegian system may be in place in 2003.
The European Commission has also made a proposal for emissions trading that is intended to be implemented beginning in 2005. However, in this case, trading is limited to emissions from energy production, and large, fixed facilities where coal, oil or gas is burned. So far the transportation sector is not included.
A system based on open trading in emissions rights or quotas has long enjoyed vigorous business and industry support. Large multinationals, above all in the energy and oil business – Shell and BP, for instance – have begun internal emissions trading.

International air traffic omitted from the Kyoto Protocol
International air traffic has been left out of the Kyoto Protocol. However the UN International Civil Aviation Organization (ICAO) has been tasked with attending to the role of aviation in reducing global emissions of greenhouse gases.
The ICAO has had a working group under its Committee on Aviation Environmental Protection (CAEP), which has discussed the question of various market-based solutions for reducing aviation's impact on climate.
The January 2001 report, Market Based Options, analyzes the effectiveness and consequences of a number of various market solutions. Among these are charges, taxes and voluntary agreements as well as two different systems for emissions trading – a closed one kept within the airline sector and an open one allowing free trade between countries and industries.
The analysis has studied three different alternative goals, of which the most ambitious was that aviation would fulfill the Kyoto Protocol's requirements to reduce carbon dioxide emissions. If this is to be achieved via taxes and charges, these must be high enough to raise the price of aviation fuel tenfold. This price jump would reduce airline operations and thus emissions, because flying would become too expensive. Cutting operations is currently the only way that the airline industry can on its own achieve relative reductions in carbon dioxide emissions corresponding to Kyoto Protocol targets. Today there is no known, commercially available technical solution for reaching these targets.
CAEP has done a preliminary study of the likely effects of sharply increased fuel prices on air travel. The result suggests that some air passengers would then opt for road or train travel, leading to an increase in total emissions. Although this applies chiefly to nitrogen oxides, carbon dioxide emissions would increase as well.
To achieve the environmental targets, that is, to reduce both carbon dioxide and nitrogen oxides emissions, currently requires a total reduction in transport activities. Moving transport from air to road yields no overall environmental gains, according to CAEP. Therefore the committee advocates a system of totally open emissions trading.
Such a scheme might be considerably more effective, since there are believed to be a considerable potential to cost-effectively reduce carbon dioxide emissions from sources other than aviation. In this case, for the foreseeable future the airline industry will be net purchasers of emissions rights.
Until its next assembly session in 2004, the ICAO continues to study how to incorporate aviation into a quota trading system. One of many thorny issues is finding a method of allocating international aviation's emissions to the national quotas.

The ozone layer
At high altitudes, that is, in the stratosphere, emissions of nitrogen oxides are suspected of damaging the ozone layer. Especially on northern routes, parts of international passenger traffic routes pass through the stratosphere. Otherwise it is mainly the relatively few Concordes, the Franco-British SSTs, that fly high enough to cause problems.

Nitrogen oxides cause damage in many ways
At lower altitudes and near emission sources, nitrogen oxides contribute both to acidification and eutrophication of the soil and bodies of water. In addition, together with strong sunlight, they form surface ozone. Unlike the essential ozone up in the stratosphere, surface ozone is hazardous to human health. In the upper part of the troposphere, nitrogen oxides are converted to ozone, which at such altitudes has a

greenhouse effect.

Technology and technological developments
Aircraft have long lifetimes and tie up a great deal of capital – a normal-sized new long-haul aircraft costs approx MSEK 1,000. One should bear this in mind when speaking of "best available technology" (BAT), which, by the way, does not always mean "best commercially available technology" (EBAT), which SAS Airline always endeavors to select when investing in new equipment.
The new aircraft and engine solutions on the drawing board in 2002 will likely be in service until at least the middle of this century. Development times run between 5 and ten years, and the average lifetime of an aircraft is about 30 years.
The aircraft and aircraft engine industry is dominated by a very few players, among which are the European Airbus consortium and American Boeing. In the smaller aircraft market are Canadian Bombardier, Brazilian Embraer and German Fairchild Dornier. General Electric, Rolls Royce and Pratt & Whitney predominate among engine manufacturers. In addition there is the CFMI project, a collaboration owned by General Electric and French Snecma, as well as International Aero Engine (IAE), which is controlled by Rolls Royce and Pratt & Whitney.

SAS's environmental standards contribute to engine development
The airlines play a key role in the development and environmental improvement of aircraft and engines. In this, SAS Airline is one of the absolute leaders. It was SAS's requirements that were the impetus behind the development of the so-called DAC engine for the Boeing 737s ordered in 1995. It lowered emissions of nitrogen oxides by 40% compared with existing standard engines.
When in autumn 2000, SAS Airline negotiated for engines for its new Airbus A330s, an interesting alternative was launched that combined reduced fuel consumption with lower emissions of nitrogen oxides, goals difficult to achieve in conjunction. However, the manufacturer withdrew this proposal and offered a different engine. Still, SAS continued to show interest in the earlier engine solution. This encouraged the manufacturer to redesign its other engines, with the result that there are now several engines on the market with low-emissions technology. Later on, however, it turned out that SAS opted for another engine for the Airbus A330, a Rolls Royce Trent 772B. Although the selection was determined by overall economy, the engine chosen was also the quietest and had the lowest fuel consumption.
For the new Airbus A321s, which SAS started taking delivery of in autumn 2001, SAS chose an engine from IAE, the combuster of which, however, was developed by Pratt & Whitney. This engine has the lowest carbon dioxide emissions and is the market's quietest in its class. Encouraged by SAS, IAE then proceeded to study modifying this combuster and will likely be able to deliver a very promising solution.
Together with aircraft and engine manufacturers, SAS Airline is also engaged on a project aimed at finding solutions to the problem of noise in existing aircraft and engines. In any case, a solution is expected to be ready within two to three years.

Fuels
While even now there are cars on the market that run on fuel cells or on bio-based liquid fuels, aviation will continue to depend on fossil fuels for the foreseeable future. The reason is that no alternatives fuels exist that are suited to use in the current aircraft fleet. New fuels, including synthetic ones, do not work at all with the aircraft and engines that are currently on the drawing board.
Research and development in this area, however, have been going on for quite some time. For instance, within the framework of the EU research project CryoPlane, the possibility is being explored of producing hydrogen gas in a manner that makes this fuel a realistic alternative for aviation, also economically speaking. Sweden is participating in the project through the Swedish Defence Research Agency (FOI). Airbus, Shell and Linde Gas are also involved. The problem with hydrogen gas as jet fuel, besides the risk of explosion, is that the energy output from combustion is lower than that for jet fuel, meaning that aircraft will require fuel tanks approximately three times the size of today's tanks. Other groups of scientists are studying the possibility of

producing synthetic aviation fuel from biomass, particularly waste. One of the more interesting projects in this regard is being carried out by the Gothenburg technology company Oroboros in collaboration with researchers at Chalmers University of Technology. The whole point of biofuels is that they are carbon dioxide-neutral, i.e. when combusted, they do not contribute to an increase in concentrations of atmospheric carbon dioxide, which fossil fuels do. Here they are also studying the possibility of extracting high-value fuel from industrial waste gases.
SAS supports and participates in the project, along with the Swedish Civil Aviation Authority, the Swedish Energy Agency and Volvo Aerospace. The objective is to develop a jet fuel, primarily from biomass, that is cleaner than today's jet fuel.
and nearly always operate full.

Environmental management report SAS Airline

Flight operations

Flight operations account for approx. 86% of the SAS Group's total environmental impact. SAS Airline accounts for the lion's share. On a global scale, aircraft emissions of carbon dioxide affect the climate and the stratospheric emissions of nitrogen oxides contribute to depletion of the ozone layer. At the local level, the environmental impact of aircraft is associated with noise during takeoff and landing. Furthermore, local emissions of nitrogen oxides cause acidification and eutrophication of soil and water.

In 2001, SAS Airline's total production, measured by ATK, rose by 5.1% to 5,006 (4,763) MATK. At the same time, utilized capacity increased by 1.2% to 3,125 (3,088) MRTK.

The cabin factor went down 2 percentage points to 65% or 71%, counting passengers who pay less than 25% of the fare. At the same time, it should be stressed that SAS Airline's cabin factor increased by 3 percentage points the year before, the highest the company has had since 1992.

Fuel consumption and emissions

Total fuel consumption rose by 0.4% to 1,651,625 (1,645,739) m_3. However, the increase was modest in view of the fact that operations increased by 5.1%. Fuel efficiency sank marginally compared with the year before, to 46.0 (45.9) kg/100 RTK.

In 2001 SAS Airline's total emissions of carbon dioxide and nitrogen oxides increased somewhat. Emissions of carbon dioxide increased to 4,110 (4,095) ktonnes and nitrogen oxides to 14.85 (14.35) ktonnes, but emissions of hydrocarbons went down to 1.50 (1.55) ktonnes. The increase in carbon dioxide emissions is entirely proportional with the increase in fuel consumption. The higher emissions of nitrogen oxides are explained by the fact that total production increased through the phasing in of new aircraft in 2001. For example, the switch from Fokker F50 to the larger deHavilland Q400 planes has increased SAS Commuter's share of nitrogen oxide emissions by as much as 20%. The phasing in of four Airbus A340 aircraft was also a factor in the increased emissions of nitrogen oxides.

The fleet

In 2001 SAS Airline's fleet was reduced by three aircraft, to 200. Twenty-seven new planes have been ordered and will be delivered over the next two years. The scheduled deliveries comprise three Airbus A340s, four Airbus A330s, nine Airbus A321s, six Boeing 737s and five deHavilland Q400s. Because of the crisis in the airline industry, SAS Airline has negotiated delivery postponements for 15 of the aircraft that were ordered. The postponements are for an average of six months.

In 2001 SAS Airline took delivery of 24 brand new aircraft: Four Airbus A340s, designed for long-haul flights, three Airbus A321s, to be used on heavily trafficked routes within Scandinavia and the rest of Europe, three Boeing 737s, designed for short- and medium-haul routes and 14 deHavilland Q400s. The latter will be used by SAS Commuter. All of these aircraft are more ecoefficient than the planes they replaced.

In 2001 SAS Airline leased two Embraer 145s from Skyways, which conducts flights with its own personnel for SAS Airline's account, a so-called wet lease. Fuel consumption and emissions from those aircraft are included in the reported data for SAS Airline.

Since the new Airbus planes were not delivered until late 2001 they have not had any major influence on SAS Airline's overall ecoefficiency this year. However, the results will be clear over the next couple of years when all the new aircraft now on order are put into service. This will reflect the fact that the new aircraft have both greater capacity and more fuel-efficient engines. For example, the A330 and A340 have 40% more seats than the Boeing 767-300 ERs they are replacing, as well as greater cargo capacity and more fuel-efficient engines. The relative carbon dioxide emissions from the A330 and A340 are estimated to be up to 20% lower than that from the Boeing 767, per passenger.

The fact that SAS has remained firm and stuck to its investment plans will give the company an edge when the airline market starts to recover, compared with competitors who opted to put their investment plans on hold. That applies especially to airlines with older Boeing 747s or DC 9s in their possession, because these aircraft will probably have a hard time complying with future noise standards at a number of key European airports.

In 2001 SAS Airline continued working on the Configuration 2000 project, which will be completed in 2002. It involves revamping all MD-80 and MD-90 aircraft to

seat up to 9% more passengers, which will mean a relative reduction in environmental impact.

Engines

In April 2001, after long negotiations with various potential engine suppliers, SAS decided on Rolls Royce Trent 772B engines for the long-haul aircraft A330. Overall economy was the decisive factor, but not only did this engine produce the least noise, it was also lighter than the alternatives, which means more fuel efficiency and lower carbon dioxide emissions. However, the second choice of engine, from another manufacturer, was more ecoefficient with regard to limiting the amount of nitrogen oxides emission.

As for engines for the Airbus A321, the delivery of which commenced in the autumn of 2001, SAS Airline has decided that these will be emblazoned with SAS Airline's environmental logo, i.e. the same label that is affixed to the DAC engines and which stands for best commercially available technology. The V2500 engines on the A321 are manufactured by IAE. They have the lowest fuel consumption for that type of aircraft and are the quietest engines in their class.

SAS has technical problems with the DAC engines. The problems were detected in 2000 and temporarily dealt with in 2001. The engine manufacturer has now come up with a permanent solution to the problem, namely a new design of the turbine blade. All DAC engines will be successively fitted with the new turbine blades in 2002 and 2003.

The problem with the DAC engines had a totally new and unexpected consequence in 2001. In order to protect the turbine blades – while waiting for their replacement – descents from high altitudes to landing were made as much as possible with the engines idling. When the engines are idling, temperature changes occur in the combustion chamber, generating noise measuring up to 6 dB more than what should be expected. This was discovered when these otherwise unusually quiet Boeing 737-600s suddenly started being reported in the aircraft noise monitoring system at Frankfurt Airport. At takeoff, the aircraft were always relatively very quiet. The noise problems arose on approach, approximately 6 kilometers from the landing strip, while the plane was at a relatively high altitude.

Frankfurt Airport has reported the variances, but has received no complaints so far. SAS has contacted both the aircraft and the engine manufacturer in order to find a solution to the problem.

Cabin operations

Because SAS Airline switched to another caterer in 2000, the previous environmental goals no longer apply. No specific environmental goals have been discussed with the new supplier, LSG Skychefs. However, LSG Skychefs has set its own goals, which involve optimizing energy utilization, among other things.

In 2001, 5.68 liters of water and 1.15 kWh energy were consumed per produced meal. Each meal resulted in 0.31 kg of waste. Operations at the aircraft catering facility at Arlanda Airport are not included in the energy consumption calculations because of uncertainty about the collected data.

In 2001 aluminum cans were used aboard aircraft in Norway and Sweden, corresponding to 34.5 tonnes of aluminum. In Norway, 14.26 tonnes of aluminum cans are collected, corresponding to a collection rate of 76 (76%). In Sweden, only 1.16 tonnes of aluminum cans have been recorded as returned. Surveys show that they are collecting aluminum cans aboard the aircraft, exactly as before, but that the collected material is probably not being recorded. In Denmark there is a ban on using aluminum cans, which will be lifted in 2002.

LSG Skychefs has begun using new and refurbished airline catering facilities, resulting in considerably lower water and energy consumption, though waste volume have increased somewhat compared with previous inflight catering suppliers.

In 2001 SAS Airline and LSG Skychefs started work on securing data and establishing measurement numbers for these operations. This work will be completed in 2002.

In Copenhagen, LSG Skychefs encountered extraordinary problems. Because of the outbreak of foot and mouth disease, Danish authorities introduced new regulations. For example, waste from all incoming flights from Great Britain, Ireland, Holland and France had to be handled completely separately. SAS Airline then chose to use as much disposable material as possible. The alternative was to send the dishes to dishwashing at special units established for that purpose. Naturally, the environmental impact of these actions could not be studied in advance and has been impossible to fully establish so far.

In the spring of 2002 mold damage was discovered in LSG Skychefs' office building at Arlanda. After discovering the situation, SAS made two independent hygiene inspections without finding any discrepancies in the production department, which is located separate from the office department. LSG Skychefs conducted three mutually independent air-quality measurements without finding any trace of mold or other harmful substances. On the contrary the air quality was shown to be of extremely high quality in the production facility.
In SAS Airline's new organization, all cabin-related operations are managed by the business unit Inflight Services, where the environment is a priority area. In 2000, Inflight Services conducted a real-time analysis that will result in the spring of 2002 in a future vision, environmental goals and an environmental strategy. This will form the basis for operations for the next three years. This work includes developing environmental key environmental indicators for operational management. In the autumn of 2001 Inflight Services added to its staff an environmental engineer who will devote 50% of his time to environmental projects.
Environmental aspects shall always be included in grounds for decision-making, which also applies to developing new in-flight customer offerings and services. Consequently, they are studying the possibility of using, e.g., disposable plates and cups made of recycled paper on SAS Airline's short-distance flights.
Inflight Services has also developed a new wheel system that reduces the weight of the food trolleys in the new Airbus A340 and A330. Each trolley is thereby one kilogram lighter. The total effect for all the relevant aircraft is of this one kilogram per trolley translates to approx. 116 tonnes less jet fuel per year. To reduce trolley weight even further, a new and somewhat lighter drawer system is being studied for food trolleys. Every kilogram by which a plane's total weight is reduced means approx. 40 grams less fuel consumption per hour.
In 2001 SAS Airline Inflight Services launched a study into how environmental cooperation with its 500 suppliers can be more purposeful and efficient. For this reason, the company has decided that environmental standards shall be concentrated on the factors that SAS Airline can actually influence. The environmental standards should also be such that it is possible to check whether they are being complied with.
To save resources, SAS Airline amended its rules in 2001 on "uplift," i.e. beer, spirits and beverages they were obliged to take onboard at foreign destinations. Beverages are normally loaded only at SAS's domestic airports. Previously, all uplift beverages have been destroyed, but henceforth it will be permissible to serve beverages in cans and bottles labeled in a non-Scandinavian language.

Ground operations
The total amount of waste in ground operations fell by 13% to 3,544 (4,064) tonnes (not counting hazardous waste). The amount of hazardous waste was reduced by 56% to 571 (1,306) tonnes. The reduction is chiefly explained by the fact that SAS Airline has a new purification plant for process water and like the year before hauled away the process water as special waste, at a cost of MSEK 2. The investment cost for the new purification plant at Gardermoen was MSEK 8.
The ongoing energy efficiency program reduced energy consumption by SAS Airline's ground operations by 1.2%, to 341 (345) kWh/m^2. Water consumption in ground operations was 186,790 (194,359) m^3, which is a 4% reduction.
SAS Airline's properties at Arlanda have been additionally insulated in order to save energy. Gothenburg Airport conducted a discharge inventory with the aim of studying the need for water purification. It is not clear at this time whether the inventory will lead to future investment needs.
At the request of Copenhagen County, Scandinavian Technical Services (STS) has drawn up plans for a new purification plant for wastewater in conjunction with the hangar at Copenhagen airport. Scheduled for completion in mid-June 2002, the plant is the same type that SAS Commuter put into service at the airport in 2000 and will cost an estimated MSEK 8. The filtration plant is designed to separate out the heavy metals and handle oil and detergents.
Scandinavian Technical Services (STS) has invested MSEK 3.7 in a plant for cleaning aircraft wheels and brakes. In a totally automated plant water and pollutants are separated. The plant uses considerably less water, energy and cleaners and also reduces the quantity of polluted water that previously had to be hauled away by truck. In contrast with earlier, the cleaning is now done with water-based cleaning agents in a closed system.
In 2000 the property department at Copenhagen airport began installing control

units to optimize the operation of gas and oil-fired boilers at two terminal buildings covering 36 000 m^2. An evaluation done in 2001 shows that the measures have yielded energy savings of 15% per year.
June 2001 saw the opening of an enclosed container area at Copenhagen airport. It has been proposed that waste for further sorting is to be transported here from all SAS units in the domestic area, station building and technical department. The waste is handled by a specially trained person, but each department is responsible for at least attempting to pre-sort its waste.
The purpose of the collection area is to raise the quality of the sorted waste by reducing it to pure fractions. This means that SAS can be reimbursed for them instead of as before being fined for delivering impure fractions, even though the waste in question primarily consists of paper, cardboard, plastic, fluorescent tubes, electronics, PVC plastic, metals and flammable waste in two fractions – small and large – as well as a fraction for constuction waste.
At Copenhagen airport, SAS Airline and the charter airline Premiair are working on a project involving the pre-sorting of waste from aircraft. Premiair, which presorts its waste on board, delivers the waste to SAS Airline property department, which ensures that the sorting is done properly.
SAS Airline views the projects as a preliminary exercise to what may happen when the EU waste directive takes effect in 2003. The directive prohibits depositing organic and liquid waste in landfills. Because a large part of the waste SAS generates in Denmark and Sweden is incinerated, which is permitted, it is believed the directive will not have any major impact on operations in Scandinavia. On the other hand, it could affect SAS Airline at stations outside Scandinavia if more airports decide to adopt restrictions on unsorted waste.

Property sales
In 2001 SAS sold 11 airport buildings in Scandinavia to Nordisk Renting AB and GE Capital Real Estate, for a total sum of MSEK 3,000. At the same time a 20-year lease was signed with the new owners in a so-called “sale-lease back” transaction. After the 20 years SAS has the opportunity to extend the lease and also has the option of buying back the buildings. Altogether, the sale includes 11 hangars, workshops, warehouses, garages, freight terminals and offices at Arlanda (Stockholm), Landvetter (Gothenburg), Kastrup (Copenhagen), Gardermoen (Oslo) and Flesland (Bergen).
The deal is part of the SAS Group’s strategy of freeing tied up capital to help finance new aircraft. At the same time replacing older aircraft is the single biggest contribution to the improvement of the SAS Group’s ecoefficiency.
The transaction increased SAS’s liquidity so much that the company was able to relatively withstand the economic slowdown and recession marking the latter part of 2001. The cost of the lease will not be higher than what it would have been with continued ownership of the properties.
During the 20-year lease SAS is entirely responsible for operating and maintaining the buildings, which is precisely regulated in a number of agreements. The agreements also govern how any environmental problems, old as well as thus far unknown and future problems, are to be handled. SAS has the main responsibility for these problems.
SAS embraces the polluter pays principle and has consequently not had any objections to the environmental agreement, especially since SAS has operated and will continue to operate the facilities.
In conjunction with the deal, SAS and the buyer thoroughly reviewed all documentation concerning the buildings. Each building was also inspected for, for example, the existence of asbestos or other potentially problematic building materials. No significant or potential environmental problem was discovered in conjunction with the inspection and review of the documentation.
Because all of the buildings have been in constant use, they have also been maintained and are consequently in very good condition. The buildings at both Gardermoen and Kastrup are, moreover, fairly new.

Permits, infringements, incidents and disputes
No infringements of environmentally related permits were reported in 2001. Nor were any significant environmentally related incidents, disputes and complaints filed, which we dare say is unusual for a company with SAS Airline’s operations and size.

Environmental permits and mandatory reporting
Flight operations are not regulated by special environmental permits, but must com-

ply with the terms set by the various airport operators. Various national rules and may also apply.
It is the responsibility of the aircraft manufacturer to ensure that all aircraft meet the certification standards for specific maximum levels for noise and that the engines satisfy specific maximum levels for emissions. The permitted thresholds for noise and other emissions are established by the UN civil aviation organization ICAO. Before a new aircraft is put into service in a country it must be registered by the national civil aviation authority, a process that also includes environmental approval.
Cabin operations are not environmentally regulated, but SAS Airline works with suppliers who are subject to national or local permits and regulations, such as veterinary and public health ordinances relating to handling of food products and organic waste.
Ground operations at several of the airports where SAS Airline has its own operations are regulated by environmental permits. This applies, for example, to Arlanda, where SAS received a new environmental permit in 2001. Of SAS Airline's 256,000 m^2 of floor space at Arlanda, permit-regulated operations are conducted on 56,000 m^2. The permit covers SAS workshops and governs air emissions, chemical and waste handling and target and monthly mean values for wastewater from the purification plant. Until 2001 the permit was interim, but is now permanent. SAS Airline's business unit Scandinavian Technical Services (STS) submits an annual environmental report to the county administrative board of Stockholm County.
SAS Airline also has permit-regulated operations at Copenhagen airport. Of SAS's 210,000 m^2 of floor space at Copenhagen Airport, permit-regulated operations are conducted on 17,472 m^2. SAS Airline has, at the request of the City of Copenhagen, applied for an environmental permit for a further 36,530 m^2 and is awaiting the decision of the authorities. The permit covers the regulation of the environmental impact of water and air emissions from mostly workshops and hangars. In this connection, SAS has begun construction of a new wastewater purification plant in connection with SAS Airline's hangars.
None of the existing environmental permits are scheduled for renewal during the coming financial year and SAS did not receive any orders under the Swedish environmental act or from any regulatory authority in respective countries.
Beyond that mentioned above, SAS Airline has no operations requiring notification or permits under current Swedish environmental legislation.

Infringement
During the past year SAS Airline did not cause any reportable contaminating emissions or near accidents with major economic or environmental consequences.

Accidents and incidents
The major accident at Linate Airport outside Milan in October 2001 did not lead to any major environmental consequences. SAS Airline was otherwise not involved in any environmentally related incidents in 2001.

Disputes and complaints
SAS Airline was not involved in any environmentally related disputes or significant complaints in 2001.

Changes in environmental regulations
In March 2001, Amsterdam airport introduced a night ban on takeoffs and landings with hushkitted Chapter 3 aircraft, i.e. Chapter 2 planes that have been hushkitted and recertified as Chapter 3 aircraft. SAS Airline, which had been flying a DC-9 to Amsterdam, was forced to switch to another type of aircraft that complies with the noise requirements. A similar ban was introduced at Charles de Gaulle airport outside Paris.
In September 2001, the ICAO adopted a new certification standard for noise, Chapter 4, which will apply from April 2006.
The EU is preparing a new noise directive that is scheduled to take effect on April 1, 2002. It is based to a certain extent on the ICAO agreement from September 2001. In practice, the directive means that it should be possible to ban traffic with hushkitted Chapter 3 aircraft or restrict the operating hours of aircraft without a margin of at least 5 EPNdB below the Chapter 3 standard. The directive has no immediate significance for SAS Airline as the entire fleet now meets all existing noise limits.
There have otherwise not been any significant changes regarding current rules or restrictions in SAS's main markets in Denmark, Norway and Sweden.

Insurance, preparedness, preventive measures
Due to the nature of SAS Airline's operations, the possibility of environmentally detrimental accidents cannot be ruled out. SAS Airline's insurance covers the company's financial liability for environmental damage in the event of accidents and unexpected occurrences. SAS Airline has organizational resources and contingency and action plans in place to deal with crashes, accidents and incidents that can lead to contamination, in certain cases jointly with the airport operator.
In the aftermath of the terrorist attacks in the U.S.A. on September 11, 2001, the aviation insurance market underwent radical change. With seven days' notice the insurance industry canceled insurance policies covering third-party damage caused by acts of war or terrorism. To guarantee the correct amount of insurance coverage, which is also a requirement in the majority of leasing contracts, SAS Airline and other carriers were forced to request their respective governments to replace the missing insurance coverage with state guarantees. The Scandinavian states approved the request. The current guarantees run until March 31, 2002. SAS Airline cost for the state guarantees totals around MSEK 100 on an annual basis. Under normal circumstances the cost would be MSEK 2.

Other environmental matters
Following an appeal, Oslo Lufthavn A/S was issued a new environmental permit covering the threshold values for deicing liquids such as acetate, glycol and formiate.
The previous criteria were formulated in such a way that the airport would have had problems keeping the runways at Gardermoen ice and skid-free during certain periods. The rules were changed in 2001 and mean that the airport must take steps to ensure that any remnants of deicing liquids are gone from the test wells by the following summer.

Environment and economy
In 2001 SAS Airline paid a total of MSEK 1,024 (912) in external environmentally related changes. The main explanation for the increase is Norway's environmentally motivated passenger charge, which the Norwegian Storting voted to eliminate effective April 1, 2002. SAS Airline's other environmentally related costs rose to MSEK 54 (53).
By phasing in several new Boeing 737 aircraft with DAC engines, SAS Airlines emission charges in Sweden fell by 31%.
More and more airports are introducing noise-related landing charges. Frankfurt and Heathrow both have a bonus system favoring aircraft with the lowest noise levels in their class. SAS MD-80 planes have done well so far but in 2001 they disappeared from Frankfurt's bonus list because new aircraft with even better performance records have been introduced in that class.
Gardermoen airport in Norway has introduced a 50% surcharge on the landing fee for flights landing between 11 p.m. and 6 a.m. This night charge is treated as an environmental charge in the environmental report. In 2001 SAS Airline paid MSEK 0.5 in night charges, compared with MSEK 1.0 the year before.

Environmental management
SAS Airline's environmental program is part of its overall management. In 2001 SAS Airline began using the Balanced Scorecard (BSC) in operational management and the management team has an environmental performance indicator in its BSC.
Scandinavian Technical Services (STS) has continued work on designing an ISO 14001 compliant environmental management system that it plans to fully integrate into the existing quality management system. STS believes a decision on possible certification of all operations in Scandinavia will be made in early 2003.
A web-based environmental training program, which all employees are required to take, was launched in the spring of 2002. Scandinavian Technical Services (STS) employees will begin their training in the spring of 2002. To be Available on the SAS Group's intranet, the program is based on four elements: Awareness, knowledge, activity and a test. Employees must score a certain number of points to be registered as having completed the training program.

Dialogue with stakeholders
At the ICAO's general assembly in September 2001, SAS Airline had a dialogue with aviation authorities and other airlines for the purpose of forging alliances to achieve well-thought-out environmental decisions.
In 2001 SAS continued work on developing a method to determine the value of social

trust, a Social Trust Index. In collaboration with a consultant, SAS has begun building up a database and attempted to interest several other major companies in the project.
Work on the Stakeholder Analysis, which started in 2000, resulted in 2001 in the assignment of environmental issues to the new Group unit Government and External Relations (GER). One of the reasons was that the stakeholder analysis clearly showed that a majority of major stakeholders said that environmental issues were important to them. The analysis has also provided a basis that makes it possible to work in a more refined and direct manner with stakeholders, based on their expressed interest as well as what SAS believes is important to communicate to the various groups.
Together with the Norwegian Civil Aviation Administration and Oslo Lufthavn, SAS Airline participated in a discussion with the Norwegian Pollution Control Authority and the Norwegian Ministry of Environment about the problems caused by deicing chemicals. The discussion resulted in a new environmental permit for Gardermoen.
For some time SAS Airline has also carried on a dialogue about the consequences of the Norwegian passenger charges on flights. These will be dispensed with on April 1, 2002 thanks in part to SAS's efforts to influence public opinion.
Following an intensive campaign by Greenpeace in May 2001 SAS Airline signed a commitment not to carry whale meat. The background was that Greenpeace demanded and got a number of competing airlines to publicly promise that they would not carry whale meat. In the beginning SAS Airline did not believe there was any purpose in signing a commitment – the issue was simply not relevant for SAS Airline, since for financial reasons it did not intend to transport whale meat. SAS Airline eventually sided with the other carriers. The announcement caused a stir, generating considerable coverage in the Norwegian media. The whaling issue is highly sensitive in Norway, where fishing, which includes whaling, is an important industry.
A survey was conducted in 2001 concerning the web version of the SAS Environmental Report 2000 on the Internet. Respondents said that it was easy to read and well structured and the outcome provided feedback for the design of the SAS Environmental Report 2001.

Profile and image

Both SAS Airline's overall environmental image and environmental index fell in 2001, according to polls regularly carried out by the Group. The environmental image declined, however, by a considerably smaller degree than SAS Airline's overall image.
Several SAS Airline employees have been active in promoting greater environmental awareness at the European air traffic management organization Eurocontrol Guild of Air Traffic Services (EGAT). The driving force for SAS Airline has been the fact that a lack of coordination and air traffic control capacity causes delays and higher fuel consumption, thus increasing costs and environmental effects.
In September 2001, SAS Airline, as one of the largest European airlines, participated in an exhibition in conjunction with the EU conference "Greening of Transports" in Brussels. SAS Airline primarily described its environmental index and the environmental cooperation it has with aircraft and engine manufacturers in connection with negotiations on new aircraft.
Bengt Olov Näs, Director of Aircraft and Engine Analysis at SAS Airline Fleet Development, has been nominated as one of five finalists for the Swedish Utmärkt Miljöledarskap (Outstanding Environmental Management) award. The prize is awarded at the end of March 2002 by the organization Näringslivets Miljöchefer and the financial newspaper Finans Vision.
In 2001 SAS Airline's environmental director was a highly sought-after lecturer in and outside of Scandinavia. Typical topics have been aircraft and environmental issues, environmentally adapted travel and transportation, the development of environmental key performance indicators and environmental reporting. In several cases his speeches have resulted in press coverage of SAS Airline's environmental program.
SAS Airline has given guest lectures at the Royal Institute of Technology in Stockholm, the University of Oslo, the business school Erhvervsskolen Hamlet in Helsingør, and the and University College of Kalmar. SAS Airline's environmental department has also assisted a large number of students in degree programs relating to aircraft and the environment, the introduction of an environmental management system or environmental reporting.
The SAS Environmental Report 2000 was named the best environmental report of the year in Norway and Denmark. In Sweden it not only received the highest points of all, but was judged "an environmental report of international caliber" in the accounting and consulting firm Deloitte & Touche's ranking of voluntary reports by

Swedish companies.
Nominating committees in Denmark, Norway and Sweden have, independently of one another, nominated the SAS Environmental Report 2000 for the European Environmental Reporting Awards to be announced in April 2002.
SAS was the third most "improved company" in the insurance company Folksam's and financial newspaper Finanstidningen's environmental index. According to the index, SAS ranked number three in cutting its total emissions of carbon dioxide, after AssiDomän and Sydkraft.

Sponsor commitments
SAS Airline has chosen to support a number of environmental projects, including financial support of several environmental education projects for children and young people. These include the "Nature and Environment" folder and the annually published "Environmental Book," a teaching aid funded by the business community and distributed free of charge to elementary schools in Sweden and Norway.
In cooperation with the Norwegian Association of Masters of Science in Business (NSF), SAS Airline has instituted a grant to stimulate greater environmental awareness among business economists. The grant, which was awarded the first time in 2000, is given to the instructor who best succeeds in integrating environmental aspects into the curriculum. As a result of the prize, the business school in Bodø (the recipient of the first grant) decided in 2001 to offer obligatory courses in ethics and environmental protection, to be held the first and last semesters. In 2001, the prize went to an assistant professor at the Norwegian School of Management BI, which has long been a driving force in the academic community for general integration of environmental issues into subjects and courses.

Collaborations
In 2001, SAS Airline chaired the International Flight Catering Association (IFCA) environment committee. Environmental Committee. The committee has been very active under SAS Airline's leadership. Among other things, an environmental section was set up on IFCA's website. The section contains basic environmental information designed for catering suppliers and buyers, news affecting the sector, interviews, good examples of environmental practices and links to valuable information.
Under SAS Airline's leadership, IFCA decided to concentrate on waste issues in the near term. For example, in cooperation with the Association of European Airlines (AEA), IFCA will examine the laws and rules governing the handling of aircraft waste in Europe. Totally different rules are currently in force, ranging from Gardermoen's rule that airlines leave all unsorted waste there to Austria's requirement that airlines pre-sort their waste, with any number of variations in between.
SAS Airline was the International Air Transport Association (IATA)'s representative at ICAO's general meeting in September 2001.
In 2001 SAS Airline chaired Star Alliance's Environmental Advisory Group EAG. Its activities came, however, to a standstill after September 11.
For a couple of years now SAS Airline has tried to interest partners and competitors in its environmental index. Because this effort has entailed the development of common key performance indicators for the industry, the index should be able to function as a benchmarking tool. In 2001 these efforts resulted in serious discussions with a couple of European airlines.
In 2001 SAS Airline, as in previous years, held regular meetings with central authorities and environmental ministries and politicians in the three Scandinavian countries.
This year SAS Airline also took part in meetings with other companies as well as with environmental administration officers in Solna, the municipality in which SAS's main office is located.
In Norway, SAS Airline was represented on the Confederation of Norwegian Business and Industry (NHO) climate committee.

Health and safety
Health and safety operations are carried out within the framework of SAS Airline's business strategies and national regulations in the countries where SAS Airline operates. Activities are governed by special strategy and are integrated in the responsibilities of every line manager. For a more detailed account of SAS's health, environment and safety activities, see the financial annual report.

Internal audit
In 2001 SAS's internal auditors audited both the internal environmental reporting process and external auditing of the environmental report. They expressed satisfaction with the result of the audit and had only a couple of minor remarks, which have now been acted on.

Organization and process SAS Airline

SAS Airline's core activity, airline services, is governed by stringent national and international regulations with regard to quality and safety. In order to meet these requirements, SAS Airline has a special organization for systematic quality control and follow-up.
SAS Airline's environmental work is an integral part of SAS's overall management. Every manager with budget responsibility is obligated to include an environmental impact assessment as part of its decision-making basis.
SAS Airline's goal is to develop the current environmental management system into a documentable system in compliance with the international ISO 14001 environmental standard, for major parts of its operations. As a rule, environmental and quality systems used by SAS Airlines are far more rigorous than the more general environmental and quality standards in ISO 9000 and ISO 14000. The decision to apply for ISO 14001 certification will therefore be made by the respective manager according to business strategy evaluations.

Basis for SAS Airline's environmental operations

Environmental goals and strategies are adopted yearly by SAS Airline's Management Team (AMT). Aside from business strategies, their decisions are based on significant environmental aspects of the airline. SAS Airline furthermore has an environmental vision, policy, overall goals, and communication goals and strategies that are in line with SAS's sustainability policy and corporate environmental policy.

Follow-up of environmental operations

SAS Airline's Environmental Index is reviewed twice yearly by Group Management (GM), partly to raise awareness about environmental management and ensure policy follow-up, and partly to show internally that environmental issues are high on the list of priorities.
In 2001 the AMT began preliminary work on using the Balanced Scorecard (BSC) as part of its business management process. Environment will be one of several performance indicators on the scorecard. The environmental performance indicator is based on the airline business portion of SAS Airline's Environmental Index. BSC will be reported to the AMT once a month starting in early 2002.
SAS Airline's overall environmental goals are translated by respective units into goals tailored to their respective operations. In addition, every year AMT draws up an environmental program covering the prioritized objectives for the next two years. When the new program is adopted the environmental director gives a report on what was done or achieved during the year. The units are responsible for reviewing their own environmental goal attainment.
Environment is part of the internal audits that are regularly carried out. Planning, implementation, reporting and follow-up are handled by SAS Airline's Health, Environment and Safety CHES departments.

SAS Airline's environmental organization

Environmental activities are led by AMT, whose efforts are supported by the central Group staff Government and External Relations (GER) and its environmental department. The latter also functions as SAS Airline's environmental staff.
SAS Airline has environmental coordinators in the larger departments that follow up environmental work on the basis of operational plans and environmental goals. They are also part of an environmental network. The HES departments also provide advice and follow-up in those cases where working environment and external environment issues coincide.

Information and training

Managers and key staff at SAS Airlines are given environmental training since environmental competency is one of the cornerstones of the company's basic training and skills development program.
SAS Airline has developed its own web-based environmental training program but has not yet put it into service. However, Scandinavian Technical Services plans to use the training in conjunction with its ISO 14001 work in 2002.

SAS's environmental report is an important source of information about environmental conditions and achievements for all employees. SAS Airline's in-house publications and intranet are also used to communicate environmental information.

Subcontractors and other external contacts
SAS Airline's purchasing manual stipulates that all suppliers must meet environmental requirements in both negotiations on new contracts and renewal of existing ones. In general, SAS Airline demands that its suppliers have an environmental policy and action program for environmental work. Moreover, suppliers should be able to document environmental data for the goods and services SAS Airlines buys, and that their subcontractors meet the same criteria.
The biggest environmental advances are achieved through the specifications SAS Airlines makes when ordering new aircraft. During the negotiation process, SAS Airline has discussions with several aircraft and engine manufacturers. It is company policy that new aircraft must always be environmentally superior to the aircraft they replace, and to always choose the best commercially available technology.

Other stakeholders
SAS Airline has an ongoing dialogue with a variety of stakeholders other than the company's own partners and subcontractors, such as influential environmental organizations in Europe. The purpose of these talks is to discuss the external demands placed on SAS as a good corporate citizen, and to inform these organizations about the regulatory framework for the airline industry. The goal is to find common ground in important issues affecting the creation of sustainable development.

Collaboration and industry organizations
SAS Airline is part of Star Alliance, the world's largest network of airlines, whose members include SAS and 14 other major airlines. Star Alliance has an environmental committee in which SAS is an active participant. Star Alliance also has a joint Environmental Commitment Statement in which the airlines pledge to work for continuous environmental improvements and to promote development of green technology in procurements.
SAS Airline also participates in the environmental program of the three national industry organizations Flyselskapenes Landsforening in Norway, Föreningen Svenskt Flyg in Sweden and Dansk Industri in Denmark.
SAS Airline has a long-standing dialogue with the respective environmental and communications ministries and civil aviation authorities in the three Scandinavian countries. SAS also works closely with the airport operators, above all the three main airports in Copenhagen, Oslo and Stockholm.
In the international arena, SAS Airline is active in central agencies such as the International Civil Aviation Organization (ICAO), where SAS Airline represents the International Air Transport Association (IATA) in the environment committee CAEP.
SAS Airline is also part of IATA's environmental Task Force (ENTAF) and plays an active role in environmental projects and committees in the Inflight Catering Association (IFCA) and the Association of European Airlines (AEA).
SAS Airline is also active in the Nordic working group for environmental issues in aviation (N-ALM), to increase awareness of the Scandinavian perspective in international bodies such as the ICAO.

Research and development
SAS Airline carries on a continuous and systematic dialogue with aircraft and engine manufacturers to promote the development of greener technology. SAS Airline is also engaged in basic research and studies on the airline industry's environmental impact through organizations through organizations such as the ICAO, IATA and AEA and has been actively involved in the EU-funded project AERO-CERT, which follows up how actual operating emissions correlate to the data used for certification. SAS Airline supports and is participating in a research project examining the possibility of producing aviation fuel from biomass. The project is being run by the Swedish company Oroboros in cooperation with scientists from Chalmers University of Technology.
SAS Airline maintains vital contact with Scandinavian universities and colleges and

provides opportunities for academic thesis research. SAS Airline is also a contributor to the Environmental Science program at Linköping's University in Norrköping.

Environmental profiling and sponsorship

Strategic target groups for SAS Airlines environmental communication include customers, suppliers, employees, shareholders, other financial actors, the general public, mass media and the authorities. SAS Airlines therefore participates in seminars and debates and holds lectures at universities and colleges. The motive for these activities is the conviction that a well-developed environmental dimension in its brand maximizes its commercial potential and provides the company with new opportunities for business development.

For two years now SAS Airline has been working actively with Save the Children in Denmark, Norway and Sweden. The aim of the B7 program, which is run by the Norwegian environmental foundation Bellona in cooperation with SAS and 24 other private and public organizations, is to see whether it is possible to reach a consensus on the longterm environmental requirements that can be made of business in order to promote the introduction of green technology and sustainable development.

In addition, SAS Airline has chosen to sponsor a number of different environmental projects. Together with Coca-Cola, SAS Airline manages a foundation to improve the aquatic environment in the Nordic region. SAS Airline is head sponsor of the Norwegian Sofie Award and the environmental award instituted by the crown princes of Denmark and Spain, the Royal Awards for Sustainability. SAS Airline is a long-standing partner in the independent international environmental organization Worldwatch Institute and has been a corporate partner of the World Wildlife Fund, WWF, for several years.

SAS Airline provides funding for environmental education projects for children, such as the "Nature and Environment" folder given to schoolchildren in Sweden. SAS Airline has funded the folder in the municipality of Sigtuna, where Arlanda airport is located. SAS Airline also supports the publication of the "The Environmental Book" – a teaching aid funded by the business community and distributed free of charge to elementary schools in Sweden and Norway. In Norway, SAS also sponsors Blekkulf's environmental detectives, an environmental program aimed at children.

SAS's environmental vision, policy, goals and strategies

Eco-political vision

SAS's eco-political vision is for all four transport sectors (road, rail, sea and air) to pay for both investments in, and use of, their infrastructures, other costs to society (e.g. accidents) and environmental damage according to the "polluter pays principle", after which they should compete in a uniform and competitively neutral transport system.

Policy

- SAS will develop profitably in free competition, with optimal utilization of resources and minimum environmental impact, in order to contribute to environmentally sustainable development of society.

Overall goals

- Within the framework of SAS's financial and qualitative goals, all operations shall be conducted so as to cause the least possible environmental impact.
- SAS shall have one of the airline industry's most ambitious environmental programs.
- SAS shall have environmental standards equivalent to the foremost competitors in the industry.
- SAS's environmental goals and measures shall be coordinated and harmonized with other production, qualitative and financial goals.

Communication goals

- SAS shall provide an account of its environmental performance in a separate environmental report.
- SAS shall promote an understanding of the role and environmental impact of

civil aviation among external stakeholders.

Strategy

- Environmental activities shall be conducted at all levels and within all units, thus increasing environmental awareness throughout the organization.
- Environmental aspects shall be included in the grounds for all decisions in the line organization.
- SAS shall utilize/implement the methods that result in the lowest possible environmental impact.

SAS's eco-political vision, policy, goals and strategy were originally laid down by SAS management in 1995, and have thereafter been revised according to plan. SAS's Board of Directors has recently discussed the environmental policy and strategy at a meeting in early March 2001.

Environmental index

SAS Airline measures progress in its ecoefficiency with the aid of an environmental index, which is based on three component indexes, flight, cabin and ground operations. In 2001 the overall index improved by two points. The target is to achieve an improvement of on average three points per year over the period from 1996 to 2004. See “Reporting principles” for information on details regarding calculation methods and parameters.
Diagram not inkluded.

Environment and economy

SAS's environmental work has two overall objectives: Besides ensuring that the group's operations are in compliance with environmental laws and regulations, such activities should contribute to an efficient utilization of resources. Environmental activities should also enhance the value of the SAS brand.
The operations of SAS Airline are characterized by a close relationship between environmental impact and economy. There is a particularly strong relationship between owning older aircraft, phasing in new aircraft and fuel consumption, as well as the emissions that are related to fuel consumption. Fuel costs represented 10% of the Group's total costs in 2001. The combustion of fuel in aircraft engines accounted at the same time for 86% of the Group's total environmental impact, mainly from emissions of carbon dioxide and nitrogen oxides, as well as noise. The energy consumed by the ground operations and hotel operations is another important environmental and cost aspect for the Group. The economic importance of the Group's other environmental aspects, such as exceeding permits, disputes and liabilities related to contaminated properties, was insignificant in 2001, as has also been the case in earlier years.

New classification of environmental costs
Starting this year, SAS will be using new and more stringent definitions for the external environmental costs that are paid by the Group. The external environmentally related costs consists of environmental charges, and environmentally related charges and taxes. The new concepts and definitions are stated in the section "Reporting principles". The environmental costs that are reported in this year's environmental report are based on the new definitions, and apply only to SAS Airline.
The costs incurred in earlier years have also been restated based on the new definitions.

Airline industry pays for its infrastructure
A distinctive characteristic of the aviation industry is the fact that it pays for the infrastructure it uses, i.e. the airports and air traffic control systems. These costs are paid through a number of different charges, which include a number of different environmental charges and environmentally related charges. In 2001 SAS Airline paid approximately SEK 5.3 billion globally for the use of infrastructure, and approximately SEK 3.6 billion of this amount was attributable to SAS Airline's own costs. SAS Airline has only administrative responsibility for the rest of these taxes and charges. The infrastructure costs correspond to 12.4% of SAS Airline's operating revenue, as compared to 13% in 2000.

Environmental charges
The environmental charges, which are included in the infrastucture costs, are intended to cover the costs associated with particular environmental measures, such as noise measurement systems and noise insulation of properties outside the airport area. The noise charges also cover the cost of compensatory purchases of properties condemned due to noise levels. The environmental charges are normally linked to the aircraft's environmental characteristics and included in landing fees. In 2001 SAS Airline paid a total of MSEK 29.5 (14) in environmental charges, which corresponds to 0.5% of the infrastructure charges. Sweden accounts for around half of the noise charges, and the charges are used to cover noise insulation costs for properties near airports. The environmental charges paid by SAS Airline during the most recent fiveyear period are illustrated in the following table.

Environmental charges
[MSEK]

Items affecting the statement of income	1997	1998	1999	2000	2001

Noise charges	6	7	14	13	29
Night charge (Norway/Gardermoen)			2	1	0.5
Total	6	7	16	14	29.5

Environmentally related charges

A distinctive characteristic of environmentally related charges is the fact that they need not correspond to any specific environmental costs. They have been implemented solely to favor the airlines that use aircraft with better environmental performance than others. Operators who replace their aircraft with aircraft that have better environmental performance should thus be able to lower their costs in relation to their competitors.

Environmentally related charges and environmentally related charges are implemented primarily for noise. There are, however, ongoing discussions in a number of countries concerning whether environmentallly related charges based on the aircraft's hydrocarbon and nitrogen oxide emissions should be introduced. Sweden and Switzerland are already adopting such systems.

A uniform EU model is being prepared within the framework of the European Civil Aviation Conference, ECAC. This model is designed in part on the Swedish system, which is based on the volume of an aircraft's nitrogen oxide emissions. The European Commission is participating in these efforts, and it will not be surprising if the EU adopts this model as an EU Recommendation, in the same manner as the corresponding ECAC model for noise based landing fees.

Emissions based landing fees

The Swedish and Swiss systems for emissions based landing fees differ. While Sweden's system for such landing fees only takes nitrogen oxides into account, Switzerland looks at both the volume of hydrocarbons and nitrogen oxides that are emitted by the aircraft.

In 2001 SAS Airline reduced its emissions charges from MSEK 49 to MSEK 34 in Sweden alone as a result of phasing in new aircraft. The general landing fee discount, as compensation for emissions charges, is MSEK 44.

Noise based landing fees

Aircraft noise is an environmental problem that has been given more attention in recent years and entailed higher costs for SAS Airline and other airlines. Most countries have introduced noise based landing fees that reward the quietest aircraft with lower fees. The noise charges are a source of revenue for the airport operators not normally earmarked to cover a specific real cost. This means that the airport operators are forced as a rule to increase their noise charges in pace with the airlines' investments in a quieter aircraft fleet unless they are able to reduce their overall costs to compensate for lower revenues.

The environmentally related charges paid by SAS Airline during the most recent five-year period are illustrated in the following table.

Environmentally related charges

[MSEK]

Items affecting the statement of income	1997	1998	1999	2000	2001
Extra costs in the form of noise charges for use of existing Chapter 2 aircraft		49	51	49	34
Passenger charge (Norway)	50	39	33		

Total	50	88	84	49	34

Environmentally related taxes
In addition to infrastructure costs, SAS Airline pays environmentally related taxes. In 2001 SAS Airline's costs attributed to environmentally motivated passenger charges in Denmark and Norway, the environmentally related fiscal carbon tax in Norway, and the environmentally related portion of the energy tax in Denmark totaled MSEK 960 (MSEK 849).
The environmentally related taxes paid during the most recent five-year period are illustrated in the following table.

Environmentally related taxes
[MSEK]

Items affecting the statement of income	1997	1998	1999	2000	2001
Passenger charge (Denmark)		215	208	209	238
Passenger charge (Norway)	475	601	768	593	671
Carbon tax (Norway)			48	40	45
Environmental charge on energy (Denmark)			4	7	6
Total	475	816	1028	849	960

Summary of external environmentally related costs
The aggregate total for the aforementioned external environmentally related costs, such as environmental charges and environmentally related charges and taxes during the period from 1997 to 2001 was as follows:

Total external environmentally related costs
[MSEK]

Summary of external environmentally related costs	1997	1998	1999	2000	2001
Total	531	911	1128	912	1024

Other environmentally related costs
In 2001 SAS Airline's other environmentally related costs attributed to waste management, environmental share of purification plant costs, etc., totaled MSEK 45 (44). The reported costs for the environmental organization (central staffs, consultants and environmental reporting, profiling and environmental sponsorship) totaled MSEK 9.0 (9.0). The other environmentally related costs during the period from 1997 to 2001 are illustrated in the following table:

Other environmentally related costs
[MSEK]

Items affecting the statement of income	1997	1998	1999	2000	2001
Waste management, operation of purification, plants, permits, etc.,	17	19	24	21	21
Depreciation of environmental investments				21	22
Separate costs for environmental activities	6	7	8	9	9
Tax on aluminum cans (Norway)			1	2	2

Total	23	26	33	53	54

Other items affecting the statement of income
In addition to the costs reported above, SAS Airline's statement of income is affected by direct environmentally related revenues (there are, however, no such revenues to report), as well as items such as environmentally related cost reductions as a result of upgrading the aircraft fleet, negotiated landing fee discounts as a result of the improved environmental performance of the aircraft and improved waste management. The reported income enhancing items of this type during the period from 1997 to 2001 are illustrated in the following table:

Other items affecting the statement of income
[MSEK]

Items affecting the statement of income	1997	1998	1999	2000	2001
Environmentally related revenues					
Reduction in landing fees due to phase-out of Chapter 2 aircraft	25	11	10		
Discount on landing fees (Sweden)			42	44	44
Reduction in costs due to reduction in waste volumes, improved pre-sorting and increased recycling økt gjenvinning	15	8	8	8	33
Total	40	19	60	52	77

Items affecting the balance sheet
In 2001 SAS Airline's environmental investments totaled MSEK 40.1, MSEK 20 of which referred to environmentally related additional costs for DAC engines. MSEK 20.1 referred to environmentally related investments in ground operations, primarily in the form of purification plants at Gardermoen and Kastrup.
The reduction in investments in relation to 2000 (see table below) is attributed to the fact that the major environmental investments in DAC engines have been completed.
For the 2001 accounting year, SAS Airline did not make any environmentally related provisions, as was also the case for earlier years during the period from 1996 to 2001.
As in earlier years, the company did not have any environmentally related contingent liabilities.
See also the following table:

Items affecting the balance sheet
[MSEK]

Investments	1997	1998	1999	2000	2001
Flight operations		40	65	95	20
Ground operations	25	72	27	15	20,1
Total	25	112	92	110	40,1
Environmental investments as a percentage of SAS's total investments (%)	0,8	1,8	1,5	1,1	0,3
Provisions and contingent liabilities					

Environmentally related provisions	-	-	-	-	-
Environmentally related contingent liabilities	-	-	-	-	-

Emissions trading
Although international air traffic has indeed been left out of the Kyoto Protocol, the UN International Civil Aviation Organization (ICAO) has been assigned the task of studying how the airline industry can help to shoulder the responsibility for reducing greenhouse gas emissions. The ICAO is studying primarily how the airline industry can be incorporated into a system for the trading of carbon dioxide emissions rights. The airline industry, which will be fossil fuel dependent for the foreseeable future, will be a net buyer of emissions quotas. At present it is not possible to form an overall picture of the potential consequences for the company's bottom line.

Environmentally related business risks and opportunities
Well-planned and proactive environmental activities reduce the risk of violating environmental regulations, which can lead to negative publicity as well as direct costs in the form of fines and damages claims. Offensive environmental activities also reduce the risk of being caught off guard by new and more stringent environmental requirements from the market or the authorities. SAS can gain a competitive advantage by anticipating legal or tax-related requirements.
The table "Environmentally related business risks and opportunities" describes SAS Airline's most important environmentally related aspects in relation to other business risks and opportunities *(Diagram not included).*

Key performance indicators
The chief principle for selecting environmental performance indicators is their close connection with SAS's overall financial or environmental targets. They are also intended for use for internal planning, management and follow-up, as well as for both internal and external evaluation and analysis of SAS's progress in environmental matters.
The most important environmental performance indicator is SAS Airline's environmental index, which measures the progress in that business area's ecoefficiency.
In addition to SAS's environmental index, SAS has chosen to report the following environmental performance indicators in this environmental report (definitions of key terms are found in the section "Reporting principles"):
• The impact of environmental efforts on SAS Airline's image
• External environmentally related costs
• Impact on CFROI of external environmentally related costs
• Impact on EBITDAR of external environmentally related costs
• External environmentally related costs per RPK

Ecoefficiency index
SAS Airline's environmental index is a measure of ecoefficiency in this business area. During 2001 the environmental index improved by two points. Comments on the progress of the index since 1996, when it was introduced, are found in the section "Environmental index." There you will find a report of the environmental index in the underlying flight, cabin and ground operations.

Effect of environmental work on SAS Airline's image
The SAS Group is not able to report any direct environmentally related revenues. The environmental activities do, however, have an indirect effect on the value of our brand. The diagram "Environmental and overall image index" clearly illustrates that environmental activities make a positive contribution to building SAS Airline's image. In 2001 the value of SAS Airline's overall and environmental image fell. The

value of the environmental image fell, however, significantly less than SAS Airline's overall image. The reason for this is not clear.
Measurement of SAS's image incorporates eight subfactors – high level of safety, successful, professional, customer-driven, modern and innovative, environmentally aware, reliable and rethis is a positive contribution to the Scandinavian image.

Environmental image versus overall image

(Diagram not included)

Effect of external environmentally related costs on CFROI and EBITDAR
If the SAS Group is to remain independent in a changing airline industry, then its market value must increase significantly. The SAS Group's overall financial objective is to generate value for its shareholders. The SAS Group's goals for the coming fiveyear period are:
• To achieve an average CFROI of at least 17% per year
• To increase operating revenues by an average of 14% per year with 2000 as the base year
CFROI is the SAS Group's primary rate of return concept, since this key performance indicator best illustrates the return generated by the operations in relation to the actual capital employed.

Effect of external environmentally related charges on CFROI
(Diagram not included)

This measure of return reflects the EV/EBITDAR multiple, which is regarded internationally as the most important key financial performance indicator for airlines and used by a majority of the airline industry analysts.
The diagram on the preceding page illustrates how much SAS Airline's external environmentally related costs reduce CFROI. The diagram also illustrates the development of SAS Airline's operating revenues for the period.
This diagram illustrates the effect of SAS Airline's external environmentally related costs on EBITDAR. The diagram also illustrates the development of SAS Airline's operating revenues for the period. Environmental activities have a positive impact on

Environmentally related taxes and charges in relations to EBITDAR
(Diagram not included)

External environmentally related costs and operating revenue
(Diagram not included)

the results (expressed by EBIDAR, for example) of SAS Airlines and consequently the SAS Group. This impact can, however, not be expressed in any meaningful way. Investments in the best commercially available technology in the airline business yield lower fuel consumption and reduced emissions per passenger kilometer, as well as relatively lower environmental and environmentally related charges. Ecocompliant purchasing and recycling of waste gives lower waste management costs.
Less wastage and better resource management are other cost-reducing effects of environmental activities.

External environmentally related costs
This key performance indicator illustrates any changes in SAS Airline's external environmentally related costs. In order to facilitate an evaluation of cost trends, a graph illustrating the performance of SAS Airline's operating revenue during the same period has been added to the diagram.
This diagram illustrates that SAS Airline's external environmentally related costs have risen again. This is attributed primarily to an increase in the environmentally related taxes in the form of higher passenger charges in Norway, which rose to MSEK 671 (593).

External environmentally related costs per RPK
This key performance indicator shows how much airline, passengers pay on average for returned environmentally related costs per kilometer flown.
The diagram shows that the external environmentally related cost per RPK

Environmentally related charges/RPK
(*(Diagram not included)*

increased in 2001 compared with 2000. The reason is that RPK has fallen at the same time as SAS Airline’s external environmentally related costs have increased.
In 2001, SAS Airline paid an average of SEK 0.21 per RPK in external environmentally related costs. Based on this average cost, airline passengers would, for example, have to pay SEK 113 in external environmentally related costs for a trip from Oslo to Copenhagen.

Sensitivity analysis
To show how the reported results are affected by the input data, some illustrative examples are given below:
• A 1% change in fuel consumption corresponds to approx. 41,000 tonnes of CO_2 and an income effect of around MSEK 40.
• A 1% increase in the cabin factor leads to a 19% improvement in fuel efficiency to 48 g/RPK.
• SAS Airline's net income for 2001 was MSEK –1,499. If SAS were to buy emissions rights for its total carbon dioxide emissions at a cost of SEK 300 per tonne of CO_2, then the net income for 2001 would be reduced by a further MSEK 1,233. The diagram below shows the percentage effect of a hypothetical emissions quota price on SAS’s net income for the years 1997 to 2000, when the net

income was positive. The income before taxes for the period from 1997 to 2001 has been included in the diagram as a reference.

Effect of quota price on net income

(Diagram not included)

Future outlook

A new noise certification class, Chapter 4, has been introduced but applies only to new aircraft and will take effect in 2006. All of the aircraft that SAS Airline is currently buying are in compliance with the lower noise levels in chapter 4 as opposed to the existing MD80 fleet, which will not be in compliance. This may affect the value of the aircraft, especially if airports start to implement Chapter 4 as an operational limitation. This is, however, not really the intention.

The continued phasing-in of new aircraft, primarily the Airbus A321s, A340s, deHavilland Q400s and Boeing 737s places SAS Airline in a relatively favorable position with a view to performance dependent environmental charges and environmentally related charges and environmental regulations.

This is Subsidiary & Affiliated Airlines

Subsidiary & Affiliated Airlines includes the subsidiaries Braathens, Air Botnia, Spanair (there is an agreement to increase SAS's stake in 2002) and Widerøe's Flyveselskap and the affiliated airlines Skyways Holding, Cimber Air, British Midland, airBaltic and Grønlandsfly.

With its acquisition of Braathens and change of stake in Spanair, SAS Airline can further expand its operations and make more efficient use of Copenhagen as an SAS hub. The Braathens acquisition also provides room for synergies in 2002 estimated at approx. MSEK 800.

For a report on the civil aviation world, see the section "SAS Airline and the world around us".

Highlights of 2001

- Major efficiency and environmental benefits can be achieved when SAS and Braathens, which merged in 2001, can coordinate their operations.
- Widerøe has adopted measures to reduce the use of deicing liquids.
- Air Botnia renewed its entire fleet in 2001 and now boasts one of the youngest aircraft fleets in Europe.

This is Spaniar

Spanair was formed by SAS and the Spanish company Teinver in 1986. Operations started in March 1988. Spanair was initially a charter airline which served the SAS Leisure Group, among others. In February 1994, Spanair started scheduled airline operations. Scheduled flights have shown very strong growth since then and today account for 74% of Spanair's flights.

The fleet comprises 48 aircraft. The number of passengers in 2001 amounted to 8.1 million (incl. charter) and 5.7 million excluding charter. The number of employees at year-end was 2,438.

Spanair is Spain's second largest airline and investments in capacity and slots gave Spanair a 24.5% share of the Spanish domestic market in 2001. Spanair also has 14% of the landing rights at Madrid's Barajas Airport, which is of major strategic value. Spanair started intercontinental flights in November 1997, a venture which subsequently proved to be strategically incorrect.

This is Braathens

Founded in 1946, Braathens has 4,600 employees. Its aircraft fleet numbers 33, 17 Boeing 737-500s, 5 Boeing 737-400s, and 11 Boeing 737-700s. Average age of the fleet was 7.1 years. In 2002 the fleet will be reduced to 23 aircraft. In 2001 Braathens flew a total of 5.8 million passengers.

Following acute financial difficulties, Braathens invited SAS to assume ownership. The business arrangements were ready in December 2001. Braathens will continue to operate under its own name, but both companies are coordinating their operations on Norwegian domestic routes, thereby achieving major efficiency and environmental benefits.

To provide a comprehensive and efficient traffic system with less environmental impact, the companies' airline networks will be restructured before April1, 2002. In 2001, Braathens' production increased to 6,125 MATK and RPK to 3,550 MRPK. At the same time, Braathens fuel consumption was 247,041 (250,449) m^3 on domestic and international flights. Emissions of carbon dioxide on domestics flights decreased by 3.6% to 404 (419) ktonnes. Emissions of carbon dioxide per RPK increased to 196 (191) g/RPK. Braathens' cabin factor decreased by 0.8% in 2001 to 54.7 (55.5)%.

Braathens has exceeded the permitted threshold for emission of heavy metals from aircraft cleaning operations at its technical base in Stavanger. MNOK 2.5 has been allocated for a new cleaning facility, which will come on line in June 2002.

This is Widerøe's Flyveselskap

Founded in 1934, Widerøe's Flyveselskap has approx. 1,200 employees. The SAS Group has held a 63.3% stake in the company since 1998. The head office is in Bodø, with an administrative office in Oslo and operating bases in Hammerfest, Bergen, Bodø, Oslo and Sandefjord. Widerøe is Norway's largest regional airline, operating 27 aircraft (various Dash-8 models) and serving 35 destinations in Norway and 5 abroad. Widerøe is part of SAS's traffic system on domestic and foreign routes. The routes Sandefjord/Torp – Stockholm, Copenhagen, Bergen – Stavanger, Stavanger – Aberdeen and Oslo – Gothenburg supplement SAS Airline's route system.
Widerøe's production in 2001 was 709 (725) MASK. The cabin factor was 50.2%.
Fuel consumption was approx. 38,000 (39,000) m^3, yielding carbon dioxide emissions of 94.5 (97) ktonnes. Measured per available seat kilometer carbon dioxide emissions were 133 (134) g/ASK.
The company's largest environmentally related cost in 2001 consisted of a corbon tax in Norway totalling MNOK 9.9.
Glycol consumption increased in 2001 to 110,000 liters. The use of deicing liquids represents a major expense and negative environmental impact. To reduce the quantity of deicing liquids, Widerøe's has purchased its own equipment to blow snow off the aircraft before applying the deicing liquid.
Widerøe's Flyveselskap has an environmental vision, policy, overall environmental goals and an environmental strategy, which, however, has not been implemented.
In 2001 the company was not involved in any disputes and no incidents or infringements of environmentally related permits were reported. Complaints for violations of noise restrictions at Copenhagen airport were, however, lodged.

This is Air Botnia

With 303 employees, Air Botnia has been 100% owned by the SAS Group since 1998. Air Botnia operates 10 aircraft with 66 daily flights serving 11 destinations. The company is part of SAS Airline's route system and contributes toward the development of new markets. Its products, timetables and services are coordinated with SAS Airline's.

Air Botnia offers competitive feeder traffic to and from Finland, primarily to Stockholm and Copenhagen, but also to Oslo and Gothenburg as well as other Nordic destinations. Together, Air Botnia and SAS Airline operate more than 100 daily flights between Finland and the three Scandinavian countries.

In 2001 Air Botnia's fuel consumption increased to approx. 37,000 (35,000) m^3 yielding carbon dioxide emissions of 92.1 (88.1) ktonnes.

In yearly 2001 Air Botnia frequently violated Gardermoen's rules prohibiting takeoffs and landings with Chapter 2 aircraft after 4:00 p.m. and before 8:00 a.m. The problem was resolved in May 2001 when Air Botnia modernized its entire fleet. The new aircraft fleet, comprising five Avro RJ85s and five SAAB 2000s, fulfills all known present and future environmental standards. At the end of 2001 the average age of the aircraft fleet was 2.6 years, making it one of the youngest fleets in Europe.

This is Affiliated Airlines

Affiliated Airlines includes a number of regional airlines of which the SAS Group is part owner. In all, there are five airlines supplementing and expanding SAS's route system by flying to and from SAS Airline's traffic hubs on thinly trafficked routes. Skyways, Cimber Air and airBaltic fly under the slogan: "Well connected with SAS."
There is no environment-related information on these companies. For more information, see the SAS Group's Annual Report 2001.

This is Airline Related Businesses

Airline Related Businesses includes SAS Cargo, SMART, SAS Trading and Jetpak – all of which make most of their sales to external customers. SAS Flight Academy and SAS Flight Support sell services to both internal and external airlines. Scandinavian IT Group has most of its sales within the Group.

Highlights of 2001

- SAS Cargo has begun a project to create a standard for measuring the environmental impact from the transportation of goods by air.
- During the past year SMART reduced its use of copying paper by two-thirds.
- All personnel at SAS Media underwent a two-day long environmental training program.
- In 2001 SAS Media's processing of advertisements was digitalized.

This is SAS Cargo

On June 1 SAS Cargo was established as an independent limited company, SAS Cargo A/S, wholly owned by the SAS Group.

SAS Cargo's traffic income for 2001 was MSEK 2,170 (2,225). Total flown tonnage was 263,431 (286,785) tonnes. The company's performance in 2001 must be viewed in light of the tragic events of September 11 in the U.S. and the subsequent crisis in the international airline industry in an already weak market.

Through continuous improvements, SAS Cargo aims to ensure that customers, suppliers and the world at large regard SAS Cargo as the leading eco-friendly airfreight carrier.

A huge environmental advance was made in 2000 and 2001 when all major airfreight terminals in Scandinavia and North America were quality certified according to ISO 9002. This effort will serve as a platform for improving the management system to also include environmental management according to ISO 14001.

At the end of 2001 a project was initiated for creating a model and standards for environmental impact of airfreight transport, a project initiated by one of SAS Cargo's key customers.

This is Jetpak

Jetpak, a Nordic leader in “same-day” logistics, is operated by Jetpak Nordic AB, a wholly owned subsidiary of the SAS Group. Jetpak is also represented in the Nordic region by wholly owned subsidiaries, including the largest messenger-service company in the Nordic region: AdenoPicko’s.

Jetpak’s core business is to offer the Nordic transport market time-guaranteed door-to-door express deliveries, local messenger services and tailor-made service logistics solutions. Jetpak is one of the fastest growing players in express logistics in the Nordic region, represented in more than 150 locations with over 800 messenger-service cars.

Jetpak has a partner agreement with all airlines operating within and between the Nordic countries, and collaborates with the express delivery company DHL on deliveries to more than 220 countries.

This is Scandinavian IT Group

Wholly owned by the SAS Group, Scandinavian IT Group is one of the larger IT operations in Scandinavia. The portfolio of operations includes everything from state-ofthe-art IT applications to the market's best infrastructure solutions and consulting services. The high expertise required in the airline industry makes Scandinavian IT Group an expert partner for many airlines.

The SAS Group is Scandinavian IT Group's biggest customer. One of its main strategies is to increase its share of customers outside the SAS Group. The aim is to provide the airline industry with the best IT solutions and new product concepts inside and outside the aviation business.

Scandinavian IT Group currently provides approx. 40 airlines with products and services, including members of the Star Alliance.

Key performance indicators

This is SAS Trading

SAS Trading is an independent business unit within the SAS Group and a worldleading travel retail operator with 55 outlets at 34 airports in Sweden, Norway, Denmark, Estonia, Latvia and Poland. Its business concept is “to purchase, market and sell high-profile brand-name merchandise at a discount to frequent air travelers in its own stores.”

With 658 employees, SAS Trading had MSEK 2,275 in operating revenue this year. The shops at airports are operated under so-called licence agreements, i.e. the operator offers the airport owner to operate the shops for a certain number of years with rent as the value factor. After the contract period expires the shop space goes to a new bidding round.

This year SAS Trading submitted bids for tax-free shops in Copenhagen and Sweden. In both cases the licenses went to a competitor.

This is SAS Flight Academy

SAS Flight Academy is a wholly owned subsidiary of the SAS Group, operating leading training centers for pilots, cabin crew, flight technicians and ship's officers. The company is ISO 9001 certified and approved by civil aviation authorities for pilot training according to European JAR-FCL regulations.

Besides SAS, SAS Flight Academy trains customers from approx. 150 different airlines and military organizations. The main operations are conducted at Arlanda Airport as well as through subsidiaries in Denmark and Norway.

To further enhance SAS Flight Academy's position as a leading European training center, it installed a deHavilland Q400 flight simulator in March 2001 and an Airbus A330/A340 flight simulator in June 2001.

This is SMART

Scandinavian Multi Access Systems SMART AB (SMART) is owned 95% by the SAS Group and 5% by Amadeus Global Distribution S.A.

SMART is Northern Europe's leading company in the electronic sale and distribution of tickets and travel-related services, handling approx. SEK 70 billion in electronic travel transactions a year. With three business areas and offices in Copenhagen, Oslo, Stockholm, Riga and Vilnius, the company had at year-end 249 employees.

SMART has an environmental program tailored to the fact that the company conducts office operations. Its aim is to utilize natural resources as carefully as possible, with a minimal environmental impact. Waste is sorted at the source into five fractions for recycling. Whenever possible, only eco-labeled products are purchased. The cleaning firm SMART employs uses eco-friendly cleaning materials. Over the past three years SMART has reduced its use of copying paper by two thirds.

This is SAS Media

With 45 employees in its offices in Oslo and Stockholm, SAS Media is 100% owned by the SAS Group.

The company publishes SAS Airline inflight periodicals Scanorama and SAS Magazine in Denmark, Norway and Sweden. Production is financed through advertising revenues from advetisers interested in reaching the target group “onboard” under the slogan: Meet the Scandinavians. Advertisers can also communicate with the target group through other channels in the SAS Group also sold by SAS Media.

In the next few years SAS Media will increase its commitment to the digital media world. Database technology makes it possible to publish in a variety of channels, for example Internet, WAP, inflight video screens and printed publications. The aim of this commitment is to collaborate with other units of the SAS Group for cost-effective production of information, entertainment and market communication.

The company had MSEK 63 in operating revenue in 2001, with a pre-tax income of MSEK 6.

SAS Media and the enviroment

SAS Media's environmental impact is largely indirect. The direct environmental impact is associated with the consumption of energy and resources at offices, waste generation and transportation.
Since 1998 SAS Media has followed an environmental program based on TCO's environmental management system 6E, which covers both the external environment and working environment. Environmental and human resource goals are integrated into SAS Media's business plan.
Sorting routines for waste have been established at the Stockholm office. Waste is sorted into the fractions: cardboard, paper, glass, cups, toner cassettes and hazardous waste. Old furniture is auctioned off to employees or donated to charity. The Stockholm office has been renovated with a new kitchen designed for waste sorting.
A company car policy has been established whereby all company cars shall be disposed of gradually. As a first step in setting environmental requirements for all suppliers, SAS Media has started examining suppliers of repro and printing services. For this SAS Media has enlisted the aid of SAS's purchasing department. Minimizing paper consumption is key. During the year, SAS Media created a web-based price list, reducing the number of printed copies from 5,000 to 3,000.
In 2001 all advertising has become 99% digital.

Events 2001

The environmental work conducted so far at the Stockholm office will be enhanced, in that an environmental coordinator has been appointed to the Oslo office as of 2002. All personnel have taken a one-day course in natural environment issues and a one-day course in working environment issues.
SAS Media has an environmental policy stemming from SAS's overall sustainability and environmental policy, which reads as follows : "Everyone at SAS Media shall work continually to achieve long-term, permanent improvements in the external and working environments".
The environmental policy shall lead to the goal that SAS Media shall minimize its impact on the external environment and economize on ressources; that SAS Media shall be a pleasant and attractive workplace; that environmental goals and environmental measures shall be coordinated and harmonized with general production, quality and financial goals; and that environmental aspects shall be incorporated into daily work and that managers shall be good role models.

Goals and plans for 2002

In 2002 SAS Media will intensify its work in setting environmental requirements for suppliers. Inquiries will be dispatched to all suppliers:

- At the offices, the use of paper shall be measured in order to minimize paper consumption in the long term.
- A personnel handbook will be created and preferably published exclusively in electronic form.
- All new employees will receive instructions on policies regarding both the natural and working environments.
- SAS Media has environmental information at its website.

This is Rezidor SAS Hospitality

Rezidor SAS Hospitality comprises the SAS Group's hotel operations. Rezidor SAS is currently operating two hotel chains, Radisson SAS Hotels & Resorts and Malmaison. The company has adopted a new strategic focus since 2001, which envisions worldwide hotel management operations under several brands. At the end of 2001 Rezidor SAS Hospitality had operations in 38 countries. Radisson SAS operated 152 and Malmaison operated eight hotels. Rezidor SAS owned only two hotel facilities at the end of the year.
In 2001 Rezidor SAS Hospitality reported operating revenue of MSEK 3,510 (3,122), and the company had 35,000 (32,000) rooms and 12,000 (12,000) employees. Income before taxes was MSEK 208 (583).
REVPAR (Revenue Per Available Room) is an important key financial performance indicator for the hotel business. Rezidor SAS had a REVPAR of SEK 638 (619) per guest night.

Overall goals

Rezidor SAS Hospitality aims to be one of Europe's leading hospitality management businesses – with a portfolio of strong brands, focused on different market segments with corresponding high-performing products.

Scope of the environmental report

The information disclosed below applies only to Radisson SAS, which is the dominant company in Rezidor SAS, with a total of 152 hotels. Malmaison, which was acquired in 2000, is subject to the same responsible business policy and program as Radisson SAS, but it has not come as far in introducing the program. Next year Malmaison will also report on how it complies with the Responsible Business Program.

Radisson SAS Hotels & Resorts

Radisson SAS operates 152 hotels, 33 of which are operated on a franchise basis. The company had 11,700 full-time equivalent employees in 2001. The occupancy rate was 67% (69%). Radisson SAS had a total of 33,700 rooms available in 2001. Since the number of hotels reporting data varies from year to year the numbers for Radisson SAS are not always comparable.
The following pages contain diagrams showing environmental data and a description of the changes over a three-year period, both in absolute and relative figures. The diagram describes the operations at Radisson SAS Hotels & Resorts, the largest of the two hotel chains within Rezidor SAS Hospitality.

Highlights of 2001

- Radisson SAS expanded during the year with 13 new hotels for a total of 152.
- A new position titled Director Environmental & Social Affairs was established in April 2001.
- A comprehensive responsible business policy was adopted.
- Environmental and responsible business coordinators were appointed at each hotel.
- A corporate responsibility handbook was prepared and an extensive training program was introduced.

“We have taken a very big first step”

Environmental issues have been on the agenda of Radisson SAS for a long time. The first environmental policy was adopted as early as 1989. In the middle of the 1990s an action plan was established for all the hotels. It was implemented by close to 90 percent of the hotels. Radisson SAS has in other words a long environmental history compared to the hotel industry in general, but we have to date not reported to the public so much about what we have done.

We had therefore a good foundation to stand on when it was time to take the next step. This was when we launched an effort at the end of the 1990s to broaden our environmental commitment so that it would cover all aspects of the concept of sustainable development. As a result of the changing value patterns, companies started to demand that companies also work with ethical and social issues, in addition to environmental considerations.

Travelers from Scandinavia and Northern Europe also expect a hotel chain that is so closely associated with Scandinavia to live up to several important fundamental values. These include respect for the equality of all people, good health, environmental protection and nature conservation.

In 2001 we were ready to introduce our Responsible Business Program. For the first time we are making a strategic and structured move to work with issues that concern sustainable development. As a result of this program we have prepared a handbook for responsible business for all the hotels; appointed coordinators at every hotel, who are to function as supporters for the hotel managers; in addition to launching a training program for responsible business. Last year we took our first step towards a more systematic effort to ensure that all the hotel chains in SAS Rezidor contribute to sustainable development.

During the next five years we have decided to devote ourselves to a number of important issues. These include for example the establishment of routines to ensure that we purchase eco-compliant products, and that these products are purchased from suppliers who have responsible conduct with respect to the natural and working environment. We will also reduce our dependency on non-renewable natural resources through, for example, increasing the efficiency of our hotel operations, and then we will continue to train our personnel so that they can see that they can make a positive contribution to the hotel's social and environmental performance through their actions.

Brussels, February 2002

Pia Heidenmark
Director, Environmental & Social Affairs

The world around us

The travel and tourism industry is increasingly influenced by the world situation. Political conflicts, social unrest and environmental problems have a major impact on hotel operations. All these things result in less travel, as was clearly demonstrated after September 11.

The hotel industry is also influenced by fluctuations in energy and water prices, as well as waste management costs. The price of energy, oil prices in particular, fluctuates too, depending on the political situation.

The hotel and travel industry can have a positive effect on society through facilitating the preservation of local traditions and supporting the preservation of cultural heritage and the natural environment. The interest in preserving these resources increases in general when tourists start to visit a region. Uncontrolled growth in tourism without any respect for culture and the natural environment can, however, deplete the resources that the industry is dependent on for its long-term survival. The ecological footprint of too many people, who all use electricity and water, and generate waste, can also be too much for a community. Overexploitation can diminish the travelers' personal experience of a place, in addition to harming its cultural and environmental heritage. This has already occurred at several locations in the world.

It is therefore important to the long-term survival of the hotel industry that joint industry-wide agreements and strategies are established. Radisson SAS is a member of the International Hotels Environment Initiative (IHEI), which is the hotel industry's joint body for these types of issues. Other initiatives in the industry include the UN and CERES Tour Operators Initiative, in which guidelines for what tour operators can require from hotels have been prepared, in addition to CERES guidelines for key performance indicators for the hotel industry in order to facilitate reporting. To encourage hotels to make continuous improvements, the International Hotel and Restaurant Association (IH&RA), awards an annual prize to hotels that have excelled in the environmental area.

Increased environmental awareness

Environmental awareness is increasing, and it is often proportionate to improvements in prosperity, the economy and the level of education. Travelers often take their habits and fundamental values with them when they travel. They expect therefore that the hotels where they stay treat their employees and the environment properly.

Therefore the hotel industry is experiencing greater pressure to report on its performance with respect to the environment and social responsibility. The importance of this is also stressed in recommendations from the European Commission. These recommendations provide guidance for how the quality, clarity and comparability of environmental data from European companies can be improved. (EU Recommendation IP/01/814).

In many countries, issues concerning safety, the environment and social responsibility are still quite new. Investing in the environment and social responsibility can give the hotel and travel industry a competitive advantage in these countries. In other markets, such as the Northern European and Scandinavian markets, environmental issues and corporate responsibility have become a critical factor for success.

In Scandinavia there is an environmental labeling program for lodging services. The official Nordic Swan label program has published environmental criteria. Some of the Radisson SAS hotels in Scandinavia have introduced activities that are recommended by the Swan program, but none of the hotels have at present decided to seek Swan certification.

Many customers, especially major corporations, are also stipulating more explicit environmental requirements in relation to their suppliers of travel and lodging services, and even social responsibility requirements to some extent. Radisson SAS has received customer requirements from a couple of major Scandinavian and German corporations, in addition to a few conference organizers. One of the major corporations requested the disclosure of the hotel's carbon dioxide emissions in order to calculate their own employees' contribution to the greenhouse effect.

Many of Radisson SAS's competitors, primarily in the Scandinavian market, are working on environmental programs, and several of them have even started to take a broader view of their social responsibility. In general, however, the hotel industry is still in the initial phases of active and structured environmental work. This is because the customer requirements have not been noticeable until the last few years.

Environmental management report

Radisson SAS's environmental impact is primarily associated with energy, water consumption and waste generation. More efficient utilization of these resources represents at the same time an opportunity to reduce our negative environmental impact. The use of materials and chemicals also have a significant impact on the environment. Selecting ecocompliant products is therefore the best way the hotels can reduce the indirect environmental impact associated with the use of goods and services.
The consumption of energy, provided it is not based on renewable sources, contributes to global climate change. Locally this entails primarily the emission of sulfur and nitrogen oxides, which are acidic and cause eutrophication. The consumption of water is primarily a resource problem. There is a shortage of water in most parts of the world. As a hotel chain, Radisson SAS uses large volumes of products, which are associated with varying degrees of negative environmental impact. With regard to the handling of chemicals, overdosing and inefficient application can increase the hotels' contribution to eutrophication and other water pollution.

Water

Since the number of guests has a significant impact on the volume of water that is consumed, the key performance indicator for water is based on the number of guest nights.
With 1999 as the base year, water consumption per guest night has declined 22%, from 611 to 475 liters per guest night in 2001.
The Responsible Business Program includes instructions for how the hotels can conserve water. 70% of Radisson SAS's hotels have installed some type of water saving device, such as low-flush toilets and low-flow showerheads. Some hotels have also installed a system that recycles gray water, in which water from the showers is used in the toilets.

Energy

The energy costs represent a significant portion of the hotels' operating expenses. In order to facilitate comparison, the energy consumption is measured in KWh per square meter, excluding garages and similar space. From 2000 to 2001 the relative consumption of energy fell by 2.6% to 303 (311) kWh/m2.
Radisson SAS started as early as 1993 to work actively on energy conservation. From 1993 to 1999we were successful in reducing the consumption of energy by 6.2 GWh. The total carbon dioxide emissions in 2001 amounted to 6,126 tonnes.
Our goal in the energy area is to increase the share of renewable sources and to be more energy efficient. In 2001 25% of the electricity supplied to hotels was generated from renewable sources, primarily hydroelectric or wind power, as well as biomass. To increase energy efficiency the hotels have adopted a number of different measures, which include the installation of energy saving devices such as low energy lighting, energy conserving minibars and motion-controlled lighting.

Materials

Hotels consume a large volume of purchased materials daily. Chemicals comprise a priority group of materials that Radisson SAS will be working on in the coming years. Laundry detergents and cleaning agents represent the largest volume of chemicals that are used in hotels.
In 2001 a total of 247 tonnes of laundry detergent and cleaning agents were used. This corresponds to 51 grams of cleaning materials per guest night for all of Radisson SAS. This is the first time that the hotels have been requested to report this information to the head office, so there is some uncertainty concerning the reliability of the data supplied.
One of the best ways of reducing the consumption of chemicals is to install automatic dosing devices in order to reduce the risk of overdosage to a minimum. 80% of the Radisson SAS hotels have implemented dosage systems for laundry detergent and 50% have done so for cleaning agents.

Waste

In 2001 the volume of unsorted waste generated by the hotels was approximately 11,791 tonnes. It should be noted, however, that only 64 hotels have been able to report unsorted waste. In many instances it has been difficult for the hotels to obtain the data from the

local garbage collector concerning the volume of waste collected.
80% of the hotels recycle glass and 50% recycle aluminum. 80% of the Radisson SAS hotels make sure that paper is recycled and batteries are collected for proper disposal. More than 50% of the hotels collect and sort waste into as many as nine different categories, which are: paper, glass, batteries, aluminum cans, cardboard, metal, plastic, organic waste and toner cartridges.
A total of 3.1 (3.4) kg of unsorted waste is generated per guest night. There is, however, a great deal of variation between the hotels in the various regions. In Scandinavia, for example, no more than 1.4 kg of unsorted waste is generated per guest night. The differences are attributed primarily to how well-developed the infrastructure for the collection of waste is in the country in question.

Environmental management and organization
A Director, Environmental & Social Affairs, who is also responsible for social issues, was appointed in the spring of 2001. The director reports to the president of Rezidor SAS. Radisson SAS has come the furthest in terms of the organization of environmental activities. The environmental organization was reinforced during the year; coordinators were appointed at each hotel and regional coordinators were even appointed in the largest regions.

Ethics and social issues
A Responsible Business Program was developed in 2001. This applies to all of Rezidor SAS Hospitality. During the first year, most of the focus was, however, on Radisson SAS, which represents the greatest part by far of Rezidor. General as well as specific environmental targets were defined, and key performance indicators covering both the social and environmental aspects were linked to these targets. In 2001 the program was introduced in all of the regions, and hotel managers as well as coordinators were given comprehensive information on the program and how it affects them.
Radisson SAS prepared a responsible business handbook during the year. It will be distributed early in 2002, and an extensive training program will be introduced at the same time.

Environmental permits
Hotel operations are not subject to any special environmental permits. If there are restaurant operations at the hotels, then they comply with the local health, hygiene and food regulations.

Accidents and incidents
After several cases of Legionnaire's disease in the summer of 2001, some of which were fatal, the bacteria were traced to the ventilation and air conditioning system at the Radisson SAS Hotel Atlantic in Stavanger. The hotel has followed all of the appropriate regulations and maintenance routines. To date, the hotel has not been charged by the local authorities, fined or taken to court. In a press release, Radisson SAS has made clear its intent to take responsibility, if it is proved that the hotel is liable for the incident.

Infringements
All Radisson SAS hotels were, with one exception, in compliance with all the applicable regulations in 2001.
The Radisson SAS hotel in Düsseldorf has been informed by the health and safety authorities that the hotel was not in compliance with the city's new tightened building and fire safety regulations. Earlier inspections and safety audits did not uncover any safety regulation infractions at the hotel. The city of Düsseldorf has, however, tightened its regulations as a result of the fire at the airport a couple of years ago. Radisson SAS has launched a project to bring the hotel in compliance with the new requirements. The investments required to realize this project are estimated to cost MDEM 15.

Permits, infringements, incidents and disputes
None of the Radisson SAS hotels were involved in any environmentally related disputes in 2001.

Profile and image
Early in 2002 Radisson SAS organized a change collection campaign in cooperation with

Save the Children. This took place in connection with the changeover to the euro in several European countries, when a number of currencies ceased to exist.
Radisson SAS has supported selected preservation projects within the framework of the UNESCO Cultural Heritage Program for several years. In 2001 we supported the restoration of an antique tapestry in the Polish city of Krakow. The tapestry is the oldest and most valuable tapestry in Poland's 15th century collection.

Organization and process

Environmental activities at Radisson SAS Hotels & Resorts are integrated into the Responsible Business Program that was adopted in 2001. The program covers the aspects of sustainable development that have been assessed as the most significant to the hotel industry, i.e. the natural environment, human rights, health and safety, business ethics and risk prevention. The Responsible Business Program has been developed and approved by the management of Radisson SAS and its parent company Rezidor SAS Hospitality.
The Responsible Business Program was established after the identification of seven key stakeholders. These are: employees, customers, property owners and investors, suppliers, community, government and the legislative authorities, as well as the natural environment.

- Take responsibility for the health and safety of employees and customers.
- Show responsibility for social and ethical issues in the company, as well as the local and global community.
- Reduce our impact on the natural environment.

Foundation of our environmental activities

The program is based on general goals and detailed targets, with specific key performance indicators, in order to evaluate whether the individual hotel, as well as the chain as a whole, is continuously improving its performance.
Hotel operations are basically the same throughout the world in spite of the existence of certain regional differences. Radisson SAS has therefore conducted a comprehensive review of the environmental aspects, which has been presented to all of the hotels. Based on this analysis, the hotels are encouraged to study the areas that are of particular significance to their operations.
The goals and strategy for the Responsible Business Program are established by the Director, Environmental & Social Affairs, together with the management team for Rezidor SAS Hospitality. This is done on an annual basis, and the intention is to increase the number of target areas as the hotels become more used to working with the Responsible Business Program.
Due to the fact that only general goals and key performance indicators for these goals have been defined, the program will vary according to the individual prerequisites of the hotels. The hotels choose for themselves what activities they will carry out in order to improve their performance and fulfill their goals. To assist in these efforts, the hotels have a corporate responsibility handbook that has been approved by the Rezidor SAS management, which includes a list of suggested activities. The hotels establish their own action program based on this.

Environmental organization

The Director, Environmental & Social Affairs, is affiliated with the head office and reports directly to the president and the rest of the company management. The Director, Environmental & Social Affairs, coordinates all the environmental work and other activities that are associated with the Responsible Business Program at the hotels. The Environmental Director is employed by the parent company Rezidor SAS Hospitality and is also responsible for the environmental activities of Malmaison. Radisson SAS, which is the dominant unit in Rezidor and had already established environmental activities, was the first to introduce the new program.
There is a local coordinator at each hotel that supports the hotel manager with regard to work with environmental and social issues at the individual hotels. The larger regions, i.e. the regions where Radisson SAS has a large number of hotels, also have regional coordinators for the Responsible Business Program, who function as a liaison between the head office and the region.
The Responsible Business Program is a line responsibility. Thus it is the hotel and department managers who are responsible for ensuring that the program is implemented in the respective hotels and departments. The role of the coordinators is to support the line managers in this work and to report the progress made and performance data to the head office.

Reporting and follow-up

The hotels report their progress annually in the areas that are covered by the program, and certain key environmental performance data such as energy, water and waste will be reported to the head office monthly from January 2002. The monthly reporting is linked to the ordinary financial reporting system.
The hotels' performance will be followed up based on these reports quarterly with regard to the most important environmental aspects, and annually for the entire program. A selection of the hotels will also receive a visit from the head office, during which the hotel's corporate responsibility efforts will be reviewed and the hotel will be able to explain how, where and who has carried out and is responsible for the various activities.

Information and training

Radisson SAS prepared a Responsible Business Program handbook during the year. It will be distributed early in 2002, and an extensive training program will be introduced at the same time. In 2001 and no later than first part of 2002 all of the hotel managers and Responsible Business Program coordinators will have received information on the program and its implications for the hotel.
The hotels' coordinators will have also completed the basic training program during this period. They are to conduct training by department together with the training supervisor at the hotels. The training will start with the department managers and subsequently be given to all the employees.
The Responsible Business Program training will be within the framework of the

ordinary training budget. No date has been set for the completion of the training, which means that some of the regions will have completed most of the training in 2002, while others will just be starting to train the department managers in 2002 and conduct most of the training next year.

Subcontractors and other external contacts
For products where Radisson SAS is a high volume consumer and the environmental impact is significant, there will be strict environmental requirements in place for both the product and the supplier. Our work to establish structured environmental requirements is still in its infancy, and centralized purchasing has been in focus in 2001. In some cases the supplier has only been informed about Radisson SAS's environmental requirements, in other cases the environmental performance has been of decisive importance.
A large share of the products that are purchased is based on central purchasing agreements, but there are still many products that are purchased at the local level. In 2002 more general purchasing requirements will be defined to support the hotels in the local and regional purchasing that takes place. These requirements are related to having an environmental policy and action plan. Radisson SAS also plans to define specific environmental requirements for the most important product groups.
The environmental work related to purchasing that has primarily taken place at the hotel level concerns purchasing in large volume, avoiding disposable products, actively seeking eco-compliant alternatives and stipulating environmental packaging requirements. The most common eco-labeled products that are purchased by the hotels are cleaning agents, as well as office and toilet paper. Approximately 70% of the hotels purchase eco-compliant alternatives for these product groups.
With regard to the construction and renovation of hotels, Radisson SAS has prepared a list of chemicals that may not be used and a list of chemicals that are to be discontinued. The contractors are requested to work according to this list.

Collaboration
Radisson SAS cooperates with other hotels within the framework of the so-called Prince of Wales Business Leaders Forum – International Hotels Environmental Initiative. This is a forum where the various hotel chains meet to discuss industry specific questions that are related to the environment and responsible business.
Rezidor SAS Hospitality also participates in an environmental network that is currently being developed within the SAS Group, where ideas and experience are exchanged between the various business units.

Environmental profiling and sponsorship
An involvement in the community is an important part of the Responsible Business Program. While the individual hotels are responsible for involvement at the local level, the Radisson SAS head office is responsible for more general projects. We actively support for example selected preservation projects within the framework of UNESCO's Cultural Heritage Program.
There are several different sponsorship projects at the hotel level, and 76% of the hotels organize one or more charity events annually. For example, 22% of the hotels organize collection projects in the form of international events such as the Terry Fox Run and Kids to Kids, where the money that is collected goes to children in need. Other examples are donating used furniture, blankets, food, etc, to the homeless, orphanages, the Red Cross or Save the Children. Some hotels organize cleanup days when the hotel's personnel clean up rubbish from beaches and the environment.

Health and safety
To ensure a healthy and safe working environment for the employees and the guests, Radisson SAS introduced a rigorous health and safety program several years ago. The standard is based on four pillars: fire safety, guest safety, employee safety and operational safety. If the internal standard is higher than the local rules and regulations, then the internal standard shall be followed. All Radisson SAS hotels shall conduct an internal safety audit every year in order to follow up safety work.

Vision, policy, goals and strategies
Vision
Radisson SAS Hotels & Resorts shall play a leading role with regard to corporate responsibility in the international hotel industry, receive full recognition for our position and benefit from the resulting growth in value.

Responsible business policy
• We shall educate and facilitate our employees to make a conscious decision in favor of environmental and social issues in their private and business lives.
• We shall inform and make it easy for our guests to participate in Responsible Business Program related activities at our hotels.
• We shall work together with investors and property owners to find innovative solutions that satisfy our economic, environmental and social objectives.
• We shall strive to purchase products that have a reduced environmental impact during their lifecycle, from suppliers that demonstrate environmental and social responsibility.
• We shall take an active role in the international responsible business community, and contribute to the local communities where we operate.
• We require our hotel managers to abide by local and international legislation, regarding labor, health and safety, human rights and the environment.

• We shall do our utmost to ensure that our business is environmentally sustainable, and that we continuously improve our performance in the areas of energy, water, chemicals and resource consumption, and waste generation.

Overall goals
16 overall goals associated with the seven key stakeholders identified have been established. There are 17 specific targets with key performance indicators for these goals. They have been chosen so that it is possible to measure and ensure that a continuous improvement is achieved. The overall goals cover both social and environmental issues, and they are grouped around the three areas mentioned:
• Responsibility for the health and safety of employees and customers.
• Responsibility for social and ethical issues in the company, as well as the local and global community.
• Reduction of our impact on the natural environment.

Comments on the goals
• Consumption targets for energy and water, for example, that take into account what region the hotel in question is located in. Radisson SAS operates hotels in 38 countries and the climates can vary greatly. Hotels are compared with other hotels in the same region.
• There are great differences between the countries with regard to waste management and what can be sent to recycling. We measure therefore the volume of unsorted waste. Our goal is to minimize this volume.
• With regard to social responsibility, the initial focus is on involvement in the local community.
• Child labor is another aspect of social responsibility. Radisson SAS will prepare routines and increase awareness so that child labor does not occur at our hotels or at our suppliers.
• The portion of the program that is associated with the health and safety of the employees and guests has been on the agenda for a long time. Now this issue is being stressed further through the definition of specific targets.

ATK, RTK, ASK and RPK are production factors

ATK – *Available Ton Kilometers* – available (offered) capacity for passengers and cargo expressed in metric tonnes, multiplied by the distance flown (*Great Circle Distance – GCD*) in km for every individual flight. GDC is the shortest flight distance between two points, taking the curve of the earth's surface into account.

MATK – Million ATK.

RTK – *Revenue Ton Kilometers* – utilized (sold) passenger and cargo capacity expressed in tonnes (metric tons), multiplied by the distance flown (GDC) in km for every individual flight.

MRTK – Million RTK.

ASK – *Available Seat Kilometers* – the available (offered) number of passenger seats multiplied by the distance flown (GDC) in km for every individual flight.

RPK – *Revenue Passenger Kilometers* – utilized (sold) capacity for passengers expressed as the number of sold seats multiplied by the distance flown (GDC) in km for every individual flight.