ANA Group, Thinking of People and Earth

Environmental Report

～Sustainability for Society～

2005

ALL NIPPON AIRWAYS CO., Ltd

ANA Group

Editorial Policy

＜The importance of the environment still remains unchanged in the name of "CSR"＞

ANA issued its first environmental report in 1993 (for the year 1992). At that time, such activities had rarely been undertaken in the whole industrial world, and the report drew huge attention especially as a first among Japanese air carriers.

This year, in 2005, ANA proudly issued its first CSR (Corporate Social Responsibility) Report – in which it clearly introduced its strong ties to society from a broad perspective, with full colored pictures of prize-winning works from the "AOZORA" international environmental picture book contest. Though the environmental reference is made in the CSR Report, ANA has reaffirmed its responsibilities towards the environment and has been engaged in various environmental activities with a strong determination in line with CSR. Now, continuing on from those of the past years, ANA presents its 13th Environmental Report in 2005 with an aim to fulfill accountability to society.

Although the structure of the report remains as simple as that of 13 years ago, ANA will continuously strive to realize a sustainable global environment and would very much appreciate your attention and feedback on this report.

＜Reporting Period＞

April 1, 2004 to March 31, 2005

The highlights of ANA's activities after April 1, 2005 are featured in the "New Topics" section.

＜Report Coverage＞

Unless noted otherwise, this environmental report describes the activities of the following ANA Group companies.

○= Fully covered　△= Partially covered

Group companies		Abbrev.	Description of main service	Environmental compliance	Environmental accounting	Global warming / Air pollution	Resource recycling / Overall environmental activities	Environmental data book
Air transport	All Nippon Airways	ANA	Air transportation	○	○	○	○	○
	Air Nippon.	ANK	Air transportation	○	△	△	△	○
	Air Nippon Network	A-NET	Domestic air transportation	△	△	△	△	○
	Air Hokkaido	ADK	Domestic air transportation	△		△	△	○
	Air Japan.	AJX	Air transportation (mainly in Asia)	△	△	△	△	○
	Nippon Cargo Airlines	NCA	International cargo transportation	△		△		
	Air Central	CRF	Domestic air transportation			△	△	○
Ground services	International Airport Utility	IAU	Aircraft ground service (mainly in Haneda)	○				○
	Osaka Airport Service	OAS	Aircraft ground service (mainly in Itami)	○				○
	New Tokyo Airport Service	NTAS	Aircraft ground service (mainly in Narita)	○				○
	New Kansai Int'l Airport Service	NKAS	Aircraft ground service (mainly in Kansai region)	○				○
Aircraft maintenance	ANA Aircraft Maintenance	ANAM	Aircraft maintenance	○		△	○	○
	ANA Aircraft Technics	ANAAT	Aircraft maintenance (mainly for passenger cabins)	○				○
	ANA Techno Aviation	TAC	Aircraft equipment maintenance (coating and others)	○		△	○	○
	ANA Works	WORKS	Aircraft equipment maintenance (engines, washing and others)	○				○
	ANA Nagasaki Engineering	NECO	Aircraft equipment maintenance (landing gear and others)	○			○	○
	ANA Aero Supply Systems	AAS	Management of aircraft parts and resources	○				○
	ANA Engine Services	AES	Aircraft equipment maintenance (engines and others)	○				○
	ANA Aero Tech	ATEC	Aircraft equipment maintenance (hydraulic parts and others)	○				○
	ANA Avionics	AVIO	Aircraft equipment maintenance (electronic parts and others)	○				○
GSE maintenance	ANA Motor Service	ANAMS	Aircraft GSE maintenance (mainly in Haneda)	○		△		○
	Osaka Airport Motor Service	OAMS	Aircraft GSE maintenance (mainly in Itami and Kansai region)	○		△		○
	Narita Engineering Service	NES	Aircraft GSE maintenance (mainly in Narita)			△		
Other businesses	Sky Building Service	SBS	Building maintenance	○				○
	ANA Hotels & Resorts	HTLS	Hotel management	○			○	
	ANA Trading	ANATC	Commercial matters, merchandising				○	

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Corporate Philosophy

ANA Group's Corporate Philosophy

Our Commitments

On a foundation of security and reliability, ANA Group will:

- Create attractive surroundings for customers
- Continue to be a familiar presence
- Offer dreams and experience to people around the world

Course of Action

① Maintain top priority on safety
② Customer oriented
③ Contribute to society
④ Embrace new challenges
⑤ Debate with active interest, decide with confidence, and execute with conviction
⑥ Build a powerful ANA Group by effectively using human resources and focusing on teamwork as a competitive strength

ANA Environmental Policy

ANA's Attitude towards the Environment

Basic Policy

We will pursue:

- Protection of the environment
- Effective utilization of limited natural resources
- Awareness of the public good

Course of Action

1. We will evaluate the impact of our commercial activities on the environment, and persevere in our efforts to protect the environment.
2. We will observe environmental laws and regulations, and furthermore, think and act independently to protect the environment.
3. We will make our best endeavor to minimize the environmental impact arising from operations of the airline industry.
4. We will make every effort to save energy and resources, to recycle articles, and to reduce waste.
5. We will contribute to the communities in which we live and work, through participation in social activities for environmental protection.
6. We will educate employees so that each may pay much more attention to environmental protection.

Environment Committee

This ANA Environmental policy is declared both inside and outside the company

As of May 1998

Message from the Board

All Nippon Airways Co., Ltd
President & CEO
Mineo Yamamoto

山元 峯生

My belief "Keiten-Aijin" and the global environment

My name is Mineo Yamamoto and I have been the president and CEO of All Nippon Airways Co., Ltd. since April 2005. I believe that a key element of my mission should be to realize ANA Group Corporate Philosophy, especially in a way that places great importance on the protection of the global environment in accordance with the dictum in our Basic Policy stating that we shall "Continue to move forward with society".

In recent times, we have been experiencing abnormal weather phenomenon such as record heat, snowfall, drought, typhoons and hurricanes around the world. As our knowledge and wisdom will never let us anticipate atmospheric conditions perfectly, it will always be our theme to aim to take greater control of our aircraft and minimize the impact of mother nature.

A word that I try to live by is "keiten-aijin." It is a word much loved by Takamori Saigo, the legendary politician from my homeland of Kagoshima that means "respect nature and adore people" which embodies the essence of CSR (Corporate Social Responsibility) which becomes prominent nowadays. This year, ANA issued the first "CSR Report". Furthermore, in order to express our overwhelming respect towards nature, environment, and the earth, we dared to issue "Environmental Report 2005" to fulfill ANA's accountability towards environment – which is far beyond our existence.

As an airline having an impact on the global environment, ANA strongly bears the concept of "keiten-aijin" in mind. We will continue making our best efforts to win even more trust from customers and we would very much appreciate your continued patronage and support.

September 2005

All Nippon Airways Co., Ltd.
Executive Vice President
Chairman of the Environmental Committee
Chairman of the CSR Promotion Committee
Kubo Koshichiro

久保小七郎

Realizing the aims of the Kyoto Protocol

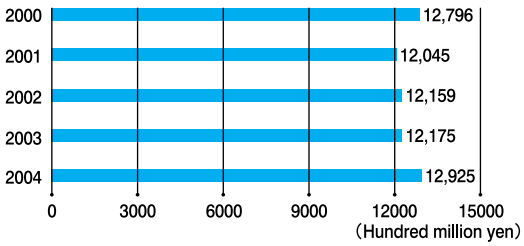
The Kyoto Protocol, which aims to act against global warming, came into effect in February 2005. In accord with the protocol, ANA was quick to declare participation in "Team Minus 6%", a national movement to realize the aims of the Kyoto Protocol. ANA has also been initiating other global warming prevention activities based on the ANA Group Ecology Plan 2003-2007 – a mid-term plan developed in 2002. Among Japanese airlines, the environmental report of ANA has the longest history, dating back to 1993. This year we present our 13th report to show our continued determination and ongoing achievements relating to the environmental issues which are gaining significance by the year. We hope you will find this report informative and we welcome your honest opinions.

September 2005

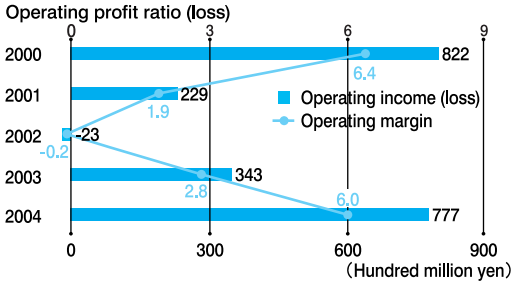
At a glance

Company name	All Nippon Airways Co., Ltd (Airline code: ANA, NH)
	All Nippon Airways Co., Ltd.　(Airline code: ANA, NH)
President & CEO	Mineo Yamamoto
Established	December 27 1952
Head office	Shiodome City Center, 1-5-2, Higashi-Shimbashi, Minato-ku, Tokyo 150-7133, Japan
Website	http://www.ana.co.jp
Paid-in capital	JPY 107,292 million
No. of employees	12,091 (Non-consolidated) / 29,098 (Consolidated)
Domestic flight	132 routes / 865 flights
International flight	35 routes / 488 flights
ANA Group	No. of subsidiaries: 132 (consolidated: 96, equity method: 6)
	No. of affiliates: 40 (equity method affiliate: 16)

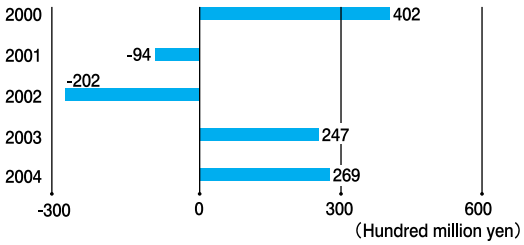
Operating revenues



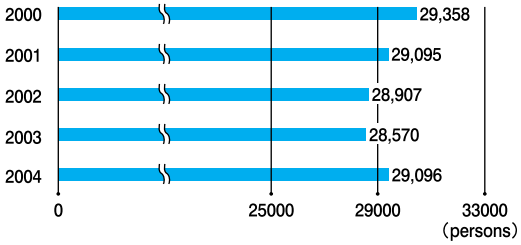
Operating profit ratio (loss)



Current net income (loss)

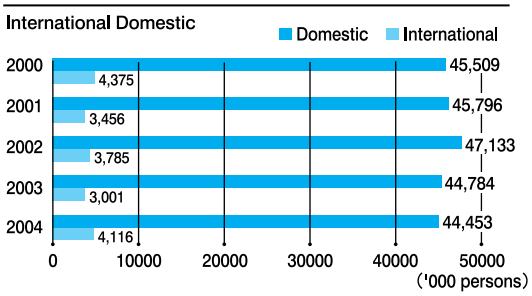


No. of employees (all ANA Group)

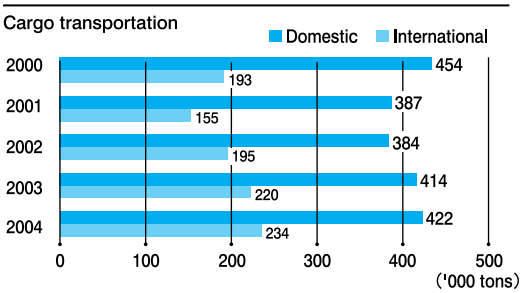


No. of aircrafts

International Domestic



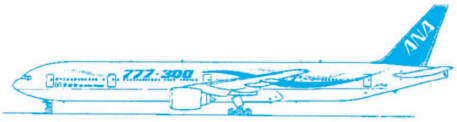
Cargo transportation



ANA Fleet

ANA fleet

(as of March 2005)

Aircraft type (No. of seats)	Number (change) *Shared	Engine type (APU type)	Avge. age	ICAO noise standard conformity to Chapter 3/4**
 **A320** (166)	28(±0) *Shared by ANK	CFM56-5A1 (APS3200)	10.9	Ch-3/4
 **A321** (195)	7(±0)	V2530-A5 (APS3200)	6.0	Ch-3/4
 **B767-300/F** (216～289) (F:Cargo 413m³)	53(+1) *Shared by AJK & ANK	CF6-80C2B2 /B6/B6F (GTCP331-200)	10.9	Ch-3/4
 **B777-200** (234～382)	18(+2)	PW4074/4077 (GTCP331-500)/4090	6.6	Ch-3/4
 **B777-300** (477～525)	7(±0)	PW4090 (GTCP331-500)	5.4	Ch-3/4
B777-300ER (247)	1(+1)	GE90-115B (GTCP331-500)	0.6	Ch-3/4
 **B747-200B** (310～377)	2(±0)	CF6-50E2 (GTCP660)	18.8	Ch-3
B747SR-100 (455～536)	2(-4)	CF6-45A2 (GTCP660)	23.0	Ch-3
 **B747-400** (320～569)	23(±0)	CF6-80C2B1F (PW901A)	11.3	Ch-3/4
Total	141 (-3)		10. 1 (-0.7:diff. from the previous year)	

(Two aircraft (B767-200, 300) are being leased in addition to the above)

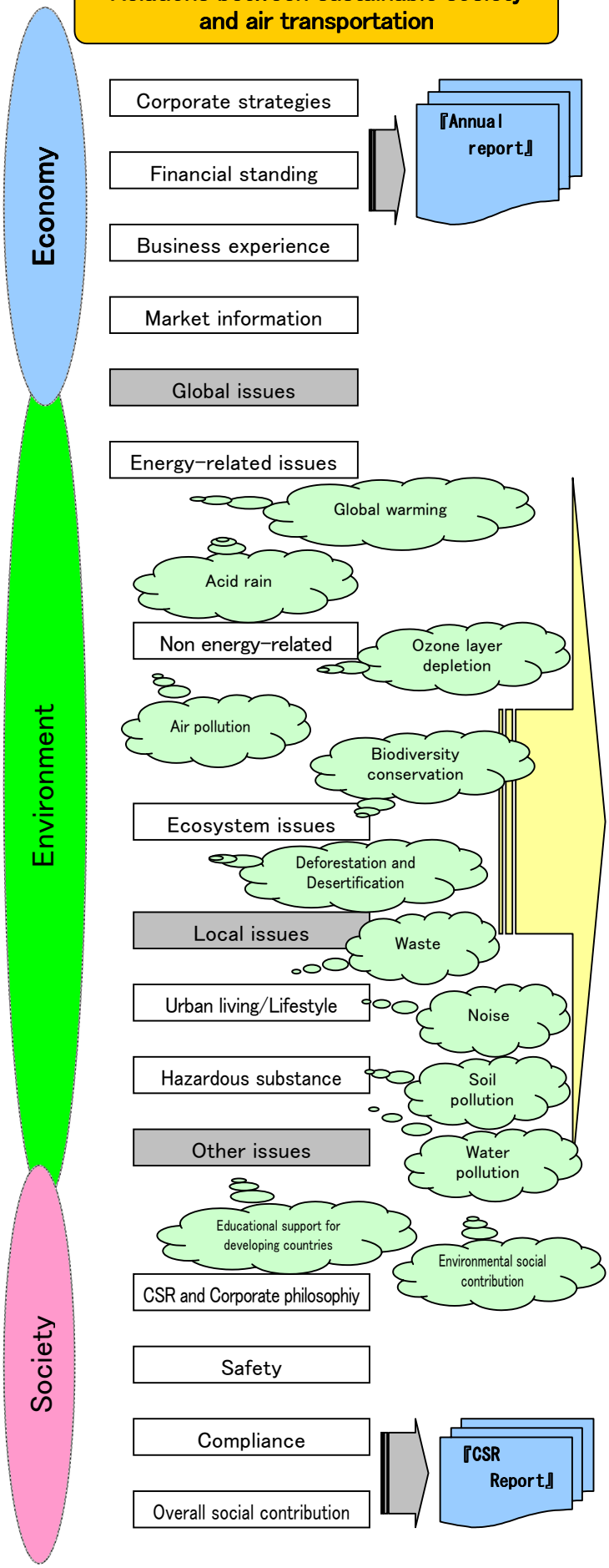
ANA Group fleet

Aircraft type (No. of seats)	Number (change) Transportation company	Engine type	Avge. age	ICAO noise standard conformity to Chapter 3/4**
 **DHC-6-300** (19)	1 (±0) ADK	PT6-27	35.0	—
 **Fokker-50** (50,56)	4 (±0) NAL	PW125B	12.4	Ch-3/4
 **DHC-8-300** (56)	5 (±0) A-net	PW-123B	3.1	Ch-3/4
 **DHC-8-400** (74)	8 (+5) A-net、NAL	PW-150A	0.9	Ch-3/4
 **B737-500** (126、133)	25(±0) ANK	CFM56-3C1 (GTCP85-129)	8.7	Ch-3/4
B737-400 (168、170)	2 (±0) ANK	CFM56-3C1 (GTCP85-129)	11.7	Ch-3/4
 **B747F/SRF** (Cargo 758m³)	11(±0) NCA	CF6-50E2 (GTCP660)	18.5	Ch-3

** ICAO Chapter 4 – New standard for post 2006 new-type certification

All B747SR-100, -200(LR), B737-400, DHC-6-300 are planned to be replaced with B747-400F and B737-700 in 2005

Relations between sustainable society and air transportation



ANA's commitments (Ecology Plan)

<Promotion of environmental management>

<Environmental compliance>
Thoroughly maintain / continuously strengthen compliance status with environmental laws

<Environmental communication>
Report clearly on environmental issues and swiftly reflect feedback

<ISO14001>
Penetrate ecological management skills relating to ISO 14001 into group companies

<Environmental accounting>
Realize environmental accounting in the group

<Penetration through ANA Group companies>
Promote transparent environmental management in all group companies

<Global warming>

<Reduction of CO_2 emissions from aviation fuel>
Cut CO_2 emissions by 12% by 2007 (per available seat kilometer) from 1990 onward

<Reducing office energy consumption>
Cut office electricity/heat energy consumption by 5% from 2002 onward

<Air pollution>

<Reduction of HC emissions from aircrafts>
Replace engines that fail to satisfy ICAO engine gas emission standards

<Introduction of lower-pollution vehicles>
Double the proportion of lower-pollution/lower-exhaust gas vehicles

<Measures for the protection of the ozone layer>
Maintain zero emissions of controlled substances

<Noise>

<Compliance with ICAO noise standards>
Ensure all ANA planes satisfy Chapter Ⅳ by 2007

<Resources Management>

<Reduction of waste>
Work towards zero emissions in the future by disclosing annual recycling achievements in detail

<Promotion of green purchasing>
Institute green purchasing for 100% of papers for copying and 80% of other stationary goods by the end of 2007

<Reduction of chemical use (PRTR)>
Develop substances to substitute PRTR-controlled chemicals

<Promotion of social contributions>

<"AOZORA" international environmental picture book contest>
Hold a competition every year for picture books which place emphasis on the environment

<Forestation activities>
Promote forestation activities inside/outside Japan

ANA Group Ecology Plan 2nd Year Achievements (fiscal year 2004)

In order to realize a sustainable society, ANA drew up the mid-term "ANA Group Ecology Plan" in 2003 which addresses the main environmental issues relating to air carriers. We declared to report on the progress of the plan every year, and below are our second year results.

Chapter 1 Promotion of environmental management

<Environmental compliance> In 2004, we added 4 offices of the Air Nippon group company and 7 ANA Hotels to our list of entities targeted to achieve compliance with environmental laws and regulations. In total the target now covers 57 business establishments (30 ANA offices and 18 group companies).

<Environmental communication> In order to introduce our environmental efforts to the broader public, we – for the first time– participated in environmental events such as "Eco Life Fear 2004" organized by the Ministry of the Environment. We also placed environmental articles in the in-flight magazine "Wingspan", and offered information through news coverage on Internet TV's "Channel J".

<ISO 14001> ISO 14001 requirements include development of environmental policy, monitoring of progress, identifying/complying with related laws/regulations and thorough target setting and follow up. We developed a group ecology plan and we undertake periodical environmental data analysis and checking for the compliance status in relation to the laws. ANA Group companies have begun to have meetings together aiming to increase the number of establishments with ISO 14001 certification.

<Environmental accounting> This covers 4 air transportation companies (ANA, ANK, AJX, A-net), yet the coverage for each has been improved to become more detailed and comprehensive.

<Penetration to ANA Group companies> We extended our questionnaire target and compliance checking range, and introduced our environmental/social contribution activities to group companies through our intranet. We also held our 10th liaison meeting promoting the penetration of environment-friendly management.

Chapter 2 Global warming

<Reduction of CO_2 emissions from aviation fuel> In 2004, we reduced our CO_2 emissions level by 10.5%, paving the way to our final target of a 12% reduction by 2007 as stated in the Ecology Plan. This achievement was made by promoting the adoption of more environment-friendly aircraft and also through standardizing EFP and washing engines regularly.

<Saving office energy consumption> We reduced our energy consumption by 7% from the previous year (calculated as a crude oil equivalent). The head office relocation of ASP (ANA Information System Planning) and large contributions to efficiency from ANA business centers contributed greatly to this achievement.

Chapter 3 Air pollution

<Reduction of HC emissions from aircraft> The HC emission level of B747SR/LR loaded engines exceeds ICAO standards in some parts. We will complete replacement of these engines during fiscal year 2005.

<Introduction of lower-pollution vehicles> The proportion of lower-pollution vehicles was 147% (80 vehicles more) in 2004 compared with 2002.

<Measures to protect the ozone layer> With the withdrawal of YS-11 of ANK in 2003, ANA Group no longer possesses any controlled CFCs (chlorofluorocarbons). Though aircraft fire extinguishers contain halon, the companies that ANA entrusts for maintenance works, are now equipped with halon recycling systems, so there are no emissions.

Chapter 4 Noise

<Compliance with ICAO noise standards> The B747LR and B747SR are aircraft that conform only to the Chapter 3 standard. We are planning to have them retired by Dec. 2005 and Mar. 2006 respectively, so that all our aircraft will satisfy the Chapter 4 standard.

Chapter 5 Resource Management

<Reduction of waste> As some of our business sites were relocated (to Haneda Terminal 2 Building in the Tokyo area and to the Chubu International Airport in the Chukyou area), our industrial waste increased. On the other hand, we doubled the amount of metallic waste (engine parts, aluminum materials from repairs, and items generated from our aircraft maintenance sectors) that is recycled for manufacture. Also, our new uniforms are recyclable and have been awarded "EcoMark" certification.

<Promotion of green purchasing> In 2004, green purchasing accounted for 30% of copying paper and 74% of other office and stationary supplies. We have been promoting green purchasing by setting an electronic purchasing system on our intranet and by positively reviewing the goods we use.

<Reduction of chemical use (PRTR)> Continuing from last year, we are carrying out research to develop the materials and skills to replace controlled hazardous substances. We used 39 kinds of such hazardous substances this year (an increase of two from the previous year), however the total weight was 25,000kg which was a decrease of 30% from the previous year.

Chapter 6 Promotion of social contribution

<"AOZORA" international environmental picture book contest> We held our second international competition, and we received entries from 382 people from 13 different countries. The grand prize work was printed (with a run of 100,000) and was not only distributed on our flights or at our branches, but also donated to environmental organizations.

<Forestation activities> Learning from previous trials, we launched fully into our "Aozora (blue sky)" forestation activities. In 2004, we conducted forestation/tree nursing activities in Haneda (Izu), Hakodate, Chitose, Miyazaki and Matsuyama, and in total 900 people joined us. Also, we planted coral in Okinawa.

Chapter 1 Promotion of environmental management

＜ANA's commitment and achievements＞

Under its Environmental Policy, ANA will continue to be sincere and modest to the earth. ANA will keep the environmental compliance status while learning further techniques from ISO and of environmental accounting. ANA will make its ecological management transparent to the broader public through efficient communication. In 2004, ANA put its focus especially on compliance and environmental communications.

Section 1 Environmental compliance

ANA has been promoting a structure to comply with environmental laws/regulations and a system to confirm the status of this since 2002 in order to respond to growing corporate social responsibilities. In 2004, overall coverage was extended, while special efforts were made to research and evaluate the situation of industrial waste, undertaken with the cooperation of experts to assure legality.

1. Research/ assure the compliance status of business establishments through the country

In 2004, we added 4 business locations of our group company Air Nippon and 7 ANA Hotels to our list to confirm the compliance status with environmental laws/ regulations. As a result, we confirmed 414 different laws/regulations relating to our operations, incurred no penalties and had no environment-related accidents.

Our accomplishments in the area of environmental compliance are as follows;

①Clarified applicable laws/regulations for each business establishment

②Improved operational procedures along with the laws/regulations applied

③Promote waste recycling simultaneously

		2002	2003	2004
		39	46	57
	Names of laws	Number of locations in compliance		
1	Law of the re-manufacture of specific home appliances (Home Appliance Recycling Law)	37	45	56
2	Waste Management and Public Cleaning Law	37	45	56
3	Law concerning the protection of the ozone layer through the control of specified substances and other measures (Ozone Layer Protection Law)	25	34	45
4	Law for ensuring the implementation of recovery and destruction of fluorocarbons related to specified products (Fluorocarbons Recovery and Destruction Law)	27	36	47
5	Law concerning special measures for promoting appropriate treatment of polychlorobiphenyl wastes	2	2	2
6	Law concerning reporting , etc. of release to the environment of specific chemical substances and promoting improvements in their management (PRTR Law)	15	18	18
7	Law for the rational use of energy (Energy Saving Law)	5	6	13
8	Air Pollution Control Law	5	6	14
9	Law concerning special measures for total emission reduction of nitrogen oxides and small particles from automobiles in specified areas (Automobile NOx-PM Law)	8	14	21
10	Water Pollution Control Low	10	11	17
11	Sewage Control Low	1	2	7
12	Septic Tank Control Law	4	4	6
13	Noise Regulation Law	5	5	8
14	Vibration Regulation Law	4	4	7
15	Offensive Odor Control Law	9	6	6
16	Factory Allocation Law	1	1	1
17	Law for developing pollution prevention organization at specified factories (Pollution Prevention System Development Law)	1	1	1
18	Toxic and Hazardous Substances Regulation Law	15	20	20
19	Container and Packaging Recycling Law	1	1	8
20	Building Material Recycling Law	—	2	2
21	Vehicle Recycling Law	—	2	8
22	Law to assure sanitary environment of buildings	—	—	7
Total		212	265	370

2. Evaluation of waste disposal contractors by peer experts

In 2004, three industrial waste experts were selected as ANA's reliable advisors, and ANA had them conduct their own investigations and make evaluations on the industrial waste contractors in service for the ANA Group. This enables ANA to assess whether or not these contractors are operating appropriately from various angles, and also to assure the ANA group companies of their monitoring responsibilities.

Investigation of waste contractors by peer experts

Section 2 Environmental communication

1. Communications outside the group

Through active communication with customers, communities, NPOs and specialists/experts, ANA attempts to make its environmental management transparent to the broader public.

＜Realization of 2-way communication＞

ANA's website contains specially designated pages for environmental issues from 1999, and is open to any inquiries and opinions through the environmental e-mail account;

Website: http://www.ana.co.jp
E-mail: kankyou@ana.co.jp

Ms. Koike, the state minister of environment, visited ANA's booth at "Eco Life Fair 2004"

ANA participated in some environmental events for the first time in 2004. In particular, we attracted approx. 140,000 visitors to the two events held in June, "the month of Environment". The ANA booth was crowded with visitors viewing the panels of picture books relating to the environment or making inquiries about airline involvements in environmental issues. On the whole, these activities gave us great opportunities for face-to face communications.

＜To realize an easy-to-understand environmental reporting＞

Together with the separately issued CSR Report, we also broadened the content of the annual environment report while aiming for further clearance. Environmental reports, we think, are very efficient communication tools in terms of their coverage and solid informative nature, yet they are weak in terms of distribution currency and range. ANA provides service to almost 50 million customers annually, and taking this popularity as an asset, we have been featuring environmental articles in our in-flight magazine "Tsubasa no Okoku (Wingspan)" since last year. We have also been employing our internet TV "Channel J", a new media tool which

uses moving images and broadcasts ANA's environmental activities (Channel J: http://www.chanelj.co.jp/). Furthermore, "ANA VISION", a report distributed to our shareholders in every quarter, also carries our environmental news and openly welcomes inquiries and opinions.

＜To act with a broad outlook – cooperation with NPOs and industry-government organizations＞

ANA believes there are some aspects which tend to be lacking or overlooked in terms of the viewpoint of business enterprises, and that it is important to have associations or interaction with those outside the business world, such as NPOs, NGOs, government offices and university academics so that we may continue to learn from them.

Cooperation with ANA

Forests, rivers and the seas – these are what characterize nature in Japan. We became too materialistic in the 20th century, and we sacrificed our irreplaceable nature, especially neglecting the valuable relationship between forests, rivers and the seas.

Kyoto University established a field scientific education research center in April 2003. This links marine science and forestry science, which had until then been largely studied independently, to develop a new academic study, "the relationship between land, forests and the sea", which promotes nature regeneration through exploring the underlying principles of natural coexistence and promotes the value of such relationships.

This new study values its links to advanced social contribution activities, with the center signing an agreement with ANA in December of last year concerning the educational purposes of environmental repair relating to the land, forests and the sea. Through cooperation with ANA, "Aozora" forestation workshops have been organized, and we have great expectations for their future activities.

Field Science Education and Research Center, Kyoto University
Director　Masaru Tanaka

ANA environmental protection activities at Kyoto University

Open workshops for communities

ANA (Air Nippon Airways) and Kyoto University came to an agreement for the joint implementation of environmental protection activities. They together began opening workshops for forest protection from 2005, and appeal to the public their positive attitudes towards the environment. The Field Science Education and Research Center of Kyoto University cooperates with ANA in its environmental protection activities, and offers "Aozora jyuku" Kyoto University field seminars.

In the "Aozora jyuku" ANA welcomes applicants from the public from March, and gives them opportunities to participate in tree planting/nursing in state-owned forest around the airports.

ANA supports the public environmental education programs organized at research-purpose forests and other nine facilities owned by the said research center. They plan joint development for environmentally conscious tours "Fields Tour (provisional)" and civic participation research centers.

ANA started its environmental protection activities "AOZORA"(my blue sky) in 2003, and has been engaged in forest protection around the airports, involved in the "AOZORA" international environmental picture book contest, and also in coral regeneration in Okinawa. Their activities are expected to become more extensive with the cooperation of Kyoto University.

Nikkei Business Daily Dec.27, 2004

NPO JWS and ANA

NPO JWS* (Japanese Association for Women in Sport) doubles as the head office of IWG (International Working Group on Women and Sports) for the 2006 World Conference on Women and Sport in Kumamoto (to be held on May 11 – 14, 2006). It participated in the "Expo 2005 Aichi Japan, Sports Summit for the Environment" as IWG, and witnessed a joint declaration on sports and the environment which stated as below;

"We are aware of a healthy global environment with clean water and air nurtured by the natural ecosystem, and the fact that these things are indispensable for us to enjoy sports. Here we declare that we shall work to prevent environmental pollution and to enrich the natural environment so that future generations can also enjoy sports as we do now"

Sports organizations are capturing more attention for their role in sustainable societies. We, JWS have long been supported by ANA, and ANA will also give us support as an official partner for the World Conference on Women and Sport.

NPO JWS Head Director, Etsuko Ogasawara

＊ JWS is an NPO first registered in Japan to support women regarding various sports-related issues. Not only does it conduct its own research and investigation, it also holds various events such as the "Women Sports Summit" and "Asian Conference on Women and Sport". It also plays an important role in the 2006 World Conference on Women and Sport in Kumamoto as a co-host organization.

2. Communication inside ANA Group

ANA Group motivates its employee's consciousness as corporate citizens by distributing a card which states the Group Corporate Philosophy (the Basic Policy and 6 courses of actions). ANA's aim is to have each and every employee take positive and autonomous actions, thereby not only providing financial support for environmental activities, but also encouraging voluntary actions. In order to realize this aim, ANA has been attempting to promote environmental awareness inside the group through monthly company magazines (ANA NOW, LINKS), web news on the intranet (KWIN) and by holding group training. Our major in-company communications are summarized as follows;

ANA Group environmental liaison meeting (10th, ANA Group educational purpose)

The purpose of this meeting is to share awareness regarding problems and to enforce the countermeasures across the whole group. In 2004, the meeting was held in September, in which 43 executive and regular employees from 29 companies got together, exchanged information on their systems and approaches and held deep discussions.

ANA environmental education (6th, ANA educational purpose)

Being aware of the large impact that airlines have on the environment, ANA holds this training to promote the significance of ecological management. The training was carried out in November and 38 people from 33 different sections participated by introducing their activities and exchanging opinions.

ANA Group environmental forum (3rd, communication promotion inside/outside the group)

This is a kind of stakeholder meeting in which ANA Group companies announce their recent activities and results, and by doing so improve employee environmental awareness and communication with those outside the group. In 2005, the forum was held in January and 180 people participated. It featured a speech by C.W. Nicole who was the head judge of the 2nd "AOZORA" international environmental picture book contest and also another keynote speech by Mr. Masaru Tanaka, director of Field Science Education and Research Center Kyoto University, entitled "regeneration of tree culture through the relationship between land, forests and the sea". Also, ANA Group companies announced case examples of their attempts, such as "improvements on aircraft washing methods", "development of cabin seat cushions" and "supporting activities for victims of the Niigata Chuuetsu Earthquake".

Environmental caravans (3rd, development by whole air transportation industry in Japan)

The Scheduled Airlines Association of Japan hosts this meeting throughout the nation with the purpose of deepening the understanding of environmental issues in the whole air transportation industry. In 2005, it was held in the period of January to March under the themes of "global warming" and "waste problems". 300 people participated, who were mainly airport-related.

ANA Group environment awareness research (4th, employee questioners)

This questionnaire seeks to understand the environmental awareness level of the employees and also to motivate them for action. In 2005, it was carried out during July to August and response rates exceeded 40%.

Section 3 ISO 14001

ANA considers ISO 14001 to be a management system which greatly contributes to ecological management. In February 2002, ANA acquired ISO 14001 (Environmental Management System) certification from UKAS, a UK-based accreditation body, for the Narita maintenance center, the head of the maintenance division. The center plays a key role for ANA's international fleet, and became the first to attain this certificate as a maintenance center which gives service for entire aircraft body parts. In February 2005, the certificate was updated to the latest 2004 version.

The Okinawa Harbor view Hotel of ANA Hotels also acquired ISO 14001 in March 2004.


BVQI
Certification
Awarded to
NARITA MAINTENANCE CENTER, ENGINEERING & MAINTENANCE
ALL NIPPON AIRWAYS CO.,LTD.
COMPANY DETAILS ARE SHOWN ON THE APPENDIX
BVQI Japan Company Limited certify that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below
Standards
ISO 14001:2004, JIS Q 14001:2004
Scope of supply
MAINTENANCE OF LARGE AIRCRAFT
13 FEBRUARY 2002
09 FEBRUARY 2008
(+ 81 45 651 4784)
Michio Sugimoto
Date 02 MARCH 2005
Certificate Number 166912
UKAS
008

Section4 Environmental Accounting

To quantitatively determine the cost of environmental conservation activities, ANA introduced its environmental accounting system in year 2001. The attempt of 2001 covered only some parts of ANA airport branches as well as the head office and other sections, yet extended to all business offices and branches in Japan. Simultaneously regarding the introduction of energy-saving aircraft and the use of ground power units (GPU) for parked aircraft, the accounting record covered group companies such as Air Nippon (ANK) and Air Japan (AJX). In 2003, the results also included Air Nippon Network (AKX), one of the ANA Group companies. Although the number of companies covered stayed the same in 2004, improvements were made in calculating research and development costs.

＜Environmental accounting record for fiscal year 2004＞

Environmental cost items		Costs	Major activities
Cost at each site	Pollution prevention costs	799	Processing disposed water from washing aircraft bodies and inter-company kitchen facilities
	Global environmental conservation costs	13,345	Introduction of energy-saving aircraft Use of ground power for parked aircraft
	Resource recycling costs	707	Appropriate waste treatment Reduction, sorting and recycling of waste
Upstream and downstream costs		121	Green purchasing for cabin service goods Measures to comply with packaging recycling law
Management activity costs		5,725	Cleaning of aircraft interiors Labor costs for environmental management Environmental education
Research and development costs		240	Improvement of engine performance (fuel efficiency) and research to improve operational method
Social activity costs		178	Published of grand-prize winner of the "AOZORA" international environmental picture book contest Tree planting/nursing and coral planting
Environmental damage recovery costs		—	None
Total		21,115	(in JPY million)

Notes
* Global environmental conservation costs: more than 80% of the aforementioned costs are purchasing/lease costs for energy-saving aircraft
* ANA Group appropriates 10% of its depreciation costs and leasing costs of aircraft to environmental accounting
* Targeting sections: All ANA sections (excluding overseas branches), ANK (Air Nippon), AJX (Air Japan) and A-net (Air Nippon Network)
* Covering period: Fiscal year 2004 (April 1, 2004 – March 31, 2005)
* Others: Based on the environmental guidelines set by the Ministry of the Environment

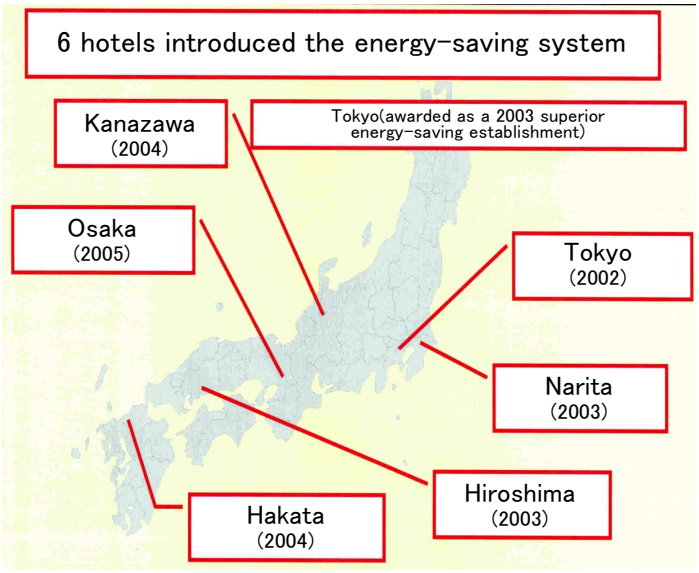
Section 5 Across the whole group

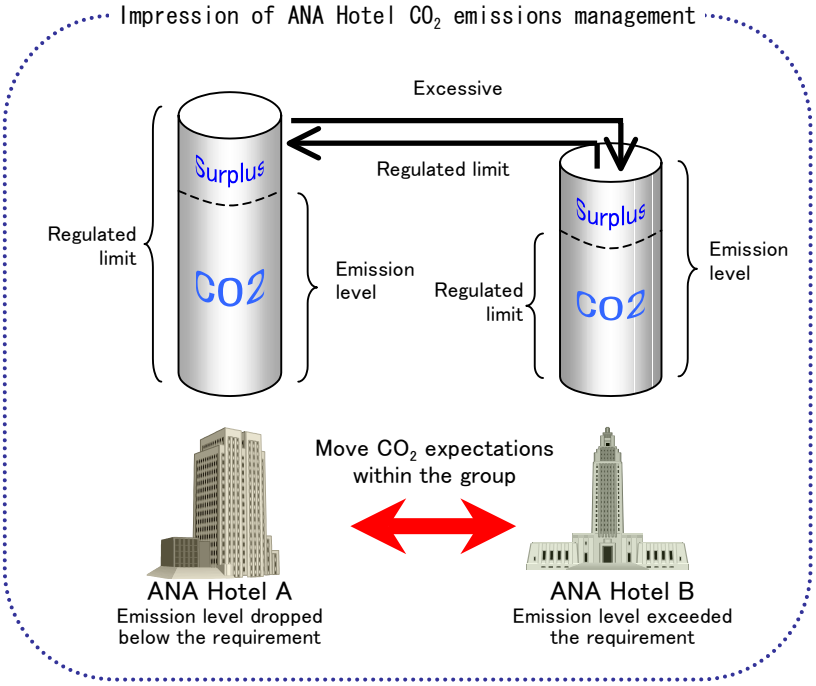
In general, environmental management data tends to focus only on headquarters and a few other branches due to its complexity. The air transportation industry tends to place more focus on aircraft-operating companies from the viewpoint of their large environmental impact. ANA avoids neglecting other companies in monitoring, and attempts to promote the idea of environmental management throughout the whole group. We strive for transparent environmental management by enforcing compliance status and thorough education as well as expanding data availability. And this year we hereby intoduce our efforts of our hotel and trading company, which have more direct contact with our customers.

ANA Hotels – shifting from cost-saving to environmental conservation

Expecting an increased reduction requirement for greenhouse effect gas at a global level, ANA Hotels have been attempting to reduce emissions at each hotel since 2000. In cooperation with specialized manufacturers, ANA Hotels have introduced a proprietary, newly invented BEMS application (Building Energy Management System) as a first in the hotel industry, which increases energy efficiency by automatically collecting and analyzing data such as room temperature and energy consumption. This enables ANA Hotels to maintain or even improve current service or facility quality, yet reduce CO_2 emissions together with utility and water costs through reduced energy consumption.

Currently 6 ANA hotels use BEMS, and the ANA Hotel Tokyo – the first one to introduce this system – reduced CO_2 emissions by 15.5% in 2003 (compared with 1990). For this achievement, it was voted as the superior energy-saving establishment of 2003 by the Kanto Bureau of Economy, Trade and Industry, and Takamitsu Shibata, who has been in charge of BEMS introduction was officially recognized as an achiever in energy management by the Agency for Natural Resources and Energy. This year the ANA Hotel & Resort Ishigaki will also introduce the energy-saving system.





Our future target is to satisfy the reduction requirement of 6% for ANA Hotels by 2008 and 2012. Also, we are planning to conduct simulations on the expectation of future suppression of CO2 emissions with special consideration given to hotels which have not satisfied the reduction requirement.

Note: Energy Collaboration Program: optimum energy management program by collaborative work of humans and machinery

ANA Trading – FSC Forest Certificate

The pulp and paper section of ANA Trading acquired the FSC Forest Certificate in 2004 – a certificate created against the background of growing environmental awareness regarding illegal international deforestation. Even in the past, the pulp and paper industries have always been active in their environmental conservation measures as seen in the examples of their developments relating to chlorine removing techniques for pulp bleaching and the recycling of waste paper. However, there was no management or system to control the raw procurement phase, in other words, there were no controls protecting forest resources, and such a control had long been required.

FSC Forest Certificate (CoC)

In order to stop international deforestation, it is important to preserve forests. Yet forestry products such as timber and paper are indispensable for our lives and it is impossible not to consume wood at all. With this situation, appropriate forest management is necessary in an attempt to combine forest preservation and maintenance of sustainable forest resources. The FSC (Forest Stewardship Council) was established in 1993, and their certification system is expected to contribute greatly to promoting proper forest management.

The FSC system has two major categories; the certificate for forest management and the certificate for manufacturing/distribution processes of forest products (CoC). The former judges if secondary forests and artificial forests (planned) are properly managed for future sustainability, and the latter judges if the forest materials with FSC certificates are managed with clear separation from other forest materials without FEC certificates. ANA Trading acquired the latter.

The ANA Group has been using FEC certified paper for its calendar "TAKE OFF" and "GRAPHIC" from 2005, and also for the CSR Reports.

With the growing environmental awareness and concerns for forest destruction in recent years, consumers pay more attention to the sources of woods or paper products and prefer it when it is proven that the products have not contributed to deforestation. ANA Trading is aware of such market needs, and tries to stay environmentally friendly so that customers will have trust in our paper products.

Chapter 2 Global Warming

＜ANA's commitment and achievements＞

In fiscal year 2004, ANA produced approx. 6,700,000 tones of CO_2, 98% of which came from the consumption of aviation fuel. In the Ecology Plan, ANA sets a goal of 12% reduction from 1990 level (per available seat kilometers) by 2007. In 2004, we achieved a 10.5% reduction, and this was due to the introduction of new models of aircraft, the standardization of the EFP system and extended regular engine washing. ANA will maintain its best efforts to attain the goal of 12% reduction.

Global warming and measures by the airline industry

1. The Kyoto Protocol and Japan

In December 1997, the Kyoto Protocol was adopted for the prevention of global warming. The protocol sets the goal of a 6% reduction of GHG (Green House Gas) emissions from the 1990 level during the period 2008 – 2012. The guideline measures for global warming prevention were developed in 1998, and the Energy Saving Law was revised and came into force in Aril 1999. The guideline measures for global warming prevention were then revised in January 2002, and the revised plans and the promotional plans for the Kyoto Protocol were approved.

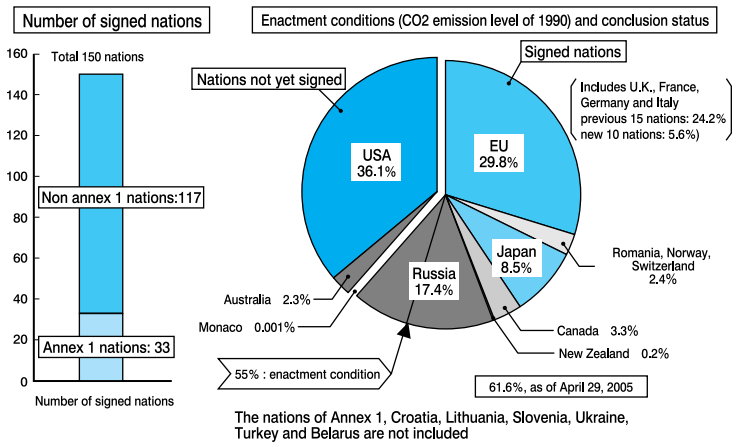
(Reference 1 shows the summary of a special report by the IPCC on how the airline industry relates to global warming.)

In September 1996, the Keidanren (Japan Federation of Economic Organizations) requested airline companies to prepare a voluntary action plan regarding environmental conservation, and three companies – ANA, JAL and JAS – set a target of 10% CO_2 emission reduction (available seat-km) from the 1990 level by 2010. The specific measures to attain this target are founded mainly on the introduction of more fuel-efficient aircraft, the use of FANS (Futuristic Air Navigation System) and the implementation of fuel savings in routine flight operation.

The Kyoto Protocol became effective on February 16, 2005 – 90 days after it was ratified by Russia in November 2004 and all the criteria relating to its becoming active were satisfied.

The target-attaining scheme of the Kyoto Protocol was approved in a Cabinet meeting in April. Related bills were also amended such as the Energy Saving Law being revised with the coverage extended to mobile objects such as air transportation.

Enactment conditions and conclusion status of Kyoto Protocol

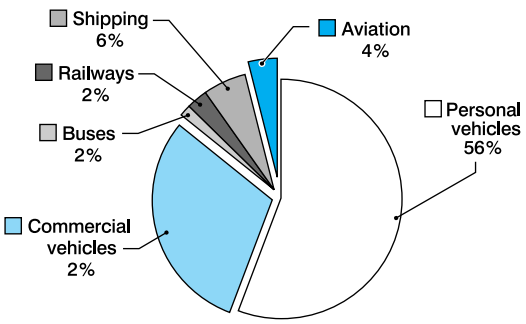


After 90 days of fulfilling below two conditions, Kyoto Protocol becomes effective.

Note: The number of ratified nations as of April 29, 2005
Source: Summarized by the Ministry of the Environment from the source of United Nations Framework Conventions on Climate Change

Among ANA's businesses, entities that emit greenhouse gasses include aircraft operations, ground maintenance of aircraft/engines and office activities. Fossil fuels are used to operate aircraft engines and the types of greenhouse gases emitted from engines include CO_2 (carbon dioxide), NOx (nitrogen oxides) and H_2O (water vapor). Here we discuss CO_2, which comprises the major part of greenhouse gas emissions in Japan (94%, 2005 White Paper on the Environment).

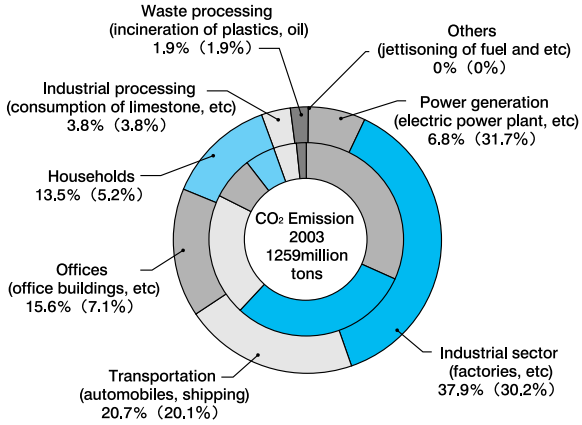
Diagram 2-2 CO_2 emissions in the transport sector of Japan (in fiscal year 2003)



Energy consumption is proportional to CO2 emission level.
Total energy consumption of transport sector in 2003 was 90,840 (unit: 10^{10} kCal)
Source: Energy/Economic Statistics by the Energy Conservation Center, Japan

According to ICAO statistics, the worldwide quantity of aviation CO_2 emissions is about 2.5-3.0% of total fossil fuel CO_2 emissions. The share of CO_2 emissions from domestic aviation in Japan was about 4.0% of the transport sector in fiscal 2000, and about 0.8% of the total industrial sector emissions.

Diagram 2-1 CO_2 emissions in Japan by sector



(1) The inner circle shows the actual emissions for each category (the figures in brackets), and the outer circle calculates the emission level of each category based on the generated electricity/heat by providers (figures on top).
(2) The breakdown of emission ratios may not total 100% as figures are rounded off.
(3) "Others" includes emissions by fuel jettisoning and margin by electricity/heat calculation.

2. ANA's CO_2 emission reduction measures

ANA states the below commitments in its Ecology Plan:

① Decrease CO_2 emissions from aviation fuels

② Reduce energy use at offices and business sites

In particular, regarding the consumption of aviation fuel (the largest source of CO_2 emissions in our business), we have greatly revised our previous target aiming toward more efficient use.

"ANA will reduce CO_2 emissions per available seat-kilometer by 12% from the 1990 level by 2007"

The original target was a 10% reduction in CO_2 emissions per available seat-km from the 1990 level by 2010.

Here we explain ① CO_2 emissions from aircraft and ② office energy use in more detail.

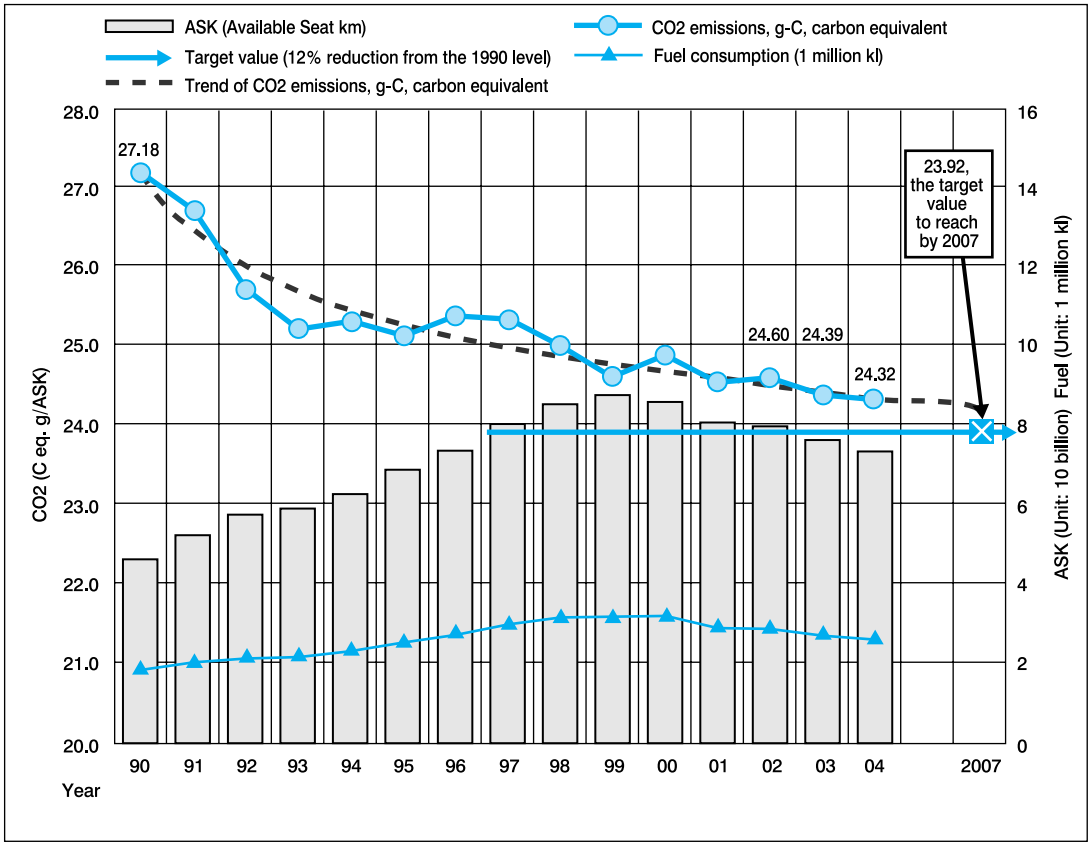
Section 1 Reduction in CO_2 emissions from aviation fuels

1. CO_2 (carbon dioxide) emissions

Currently, there is no other fuel which aviation companies can use to replace fossil fuels, thus it is important to improve efficiency of use.

ANA's CO_2 emissions from aviation activities were approx. 1.81 million tons (equivalent in carbon, approx. 6.63 million tons in CO_2 equivalent) in 2004, and this was 2% lower than in 2003. This reduction was achieved by aircraft downsizing, made possible by a system which allocates appropriate-sized aircrafts corresponding to customer demand levels. In addition, other measures explained in Chapter 3 also contribute to fuel saving.

Fig. 2-3 and Fig. 2-4 show records of CO_2 emissions for ANA and for the ANA Group respectively (both per Available-Seat-Km). As shown in the diagrams, the number of seats in service increased by a large scale from 1990, however CO_2 emissions per ASK have been decreasing. Both seat numbers and per ASK CO_2 emissions have been decreasing since 2000 due to the economic recession, a series of terrorist attacks, the Iraq war and SARS (Severe Acute Respiratory Syndrome).



Per ATK (Available Ton KG) CO_2 emissions by cargo fleet

The ANA international cargo fleet has mainly been in operation since 2002. Per ATK CO_2 emissions from the operation are as follow.

(g- CO_2 / ton kl)

Aircraft type	2002	2003	2004
B767-300F	479	446	439

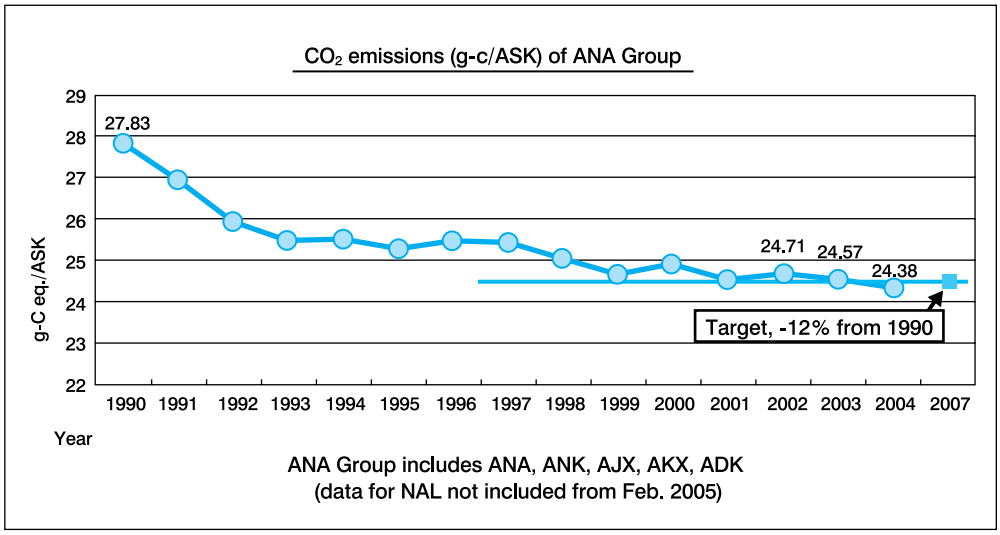


Fig. 2-4 ANA Group CO_2 emissions per ASK (excluding the date for cargo fleet)

2. Advancements in fuel-efficient aircraft

In order to reduce CO_2 emissions , or in other words to reduce fuel consumption, the most effective methods are to: (1) introduce fuel-efficient engines with the latest technologies, (2) reduce air resistance through improved wing design, and (3) reduce body weight through the use of composite materials. The B787 is the latest aircraft which employs all of these methods and ANA has ordered 50 of these aircraft for the first time as the launching customer in July 2004. This is expected to reduce fuel consumption by 20% compared with the B767-300, the aircrafts currently in service.

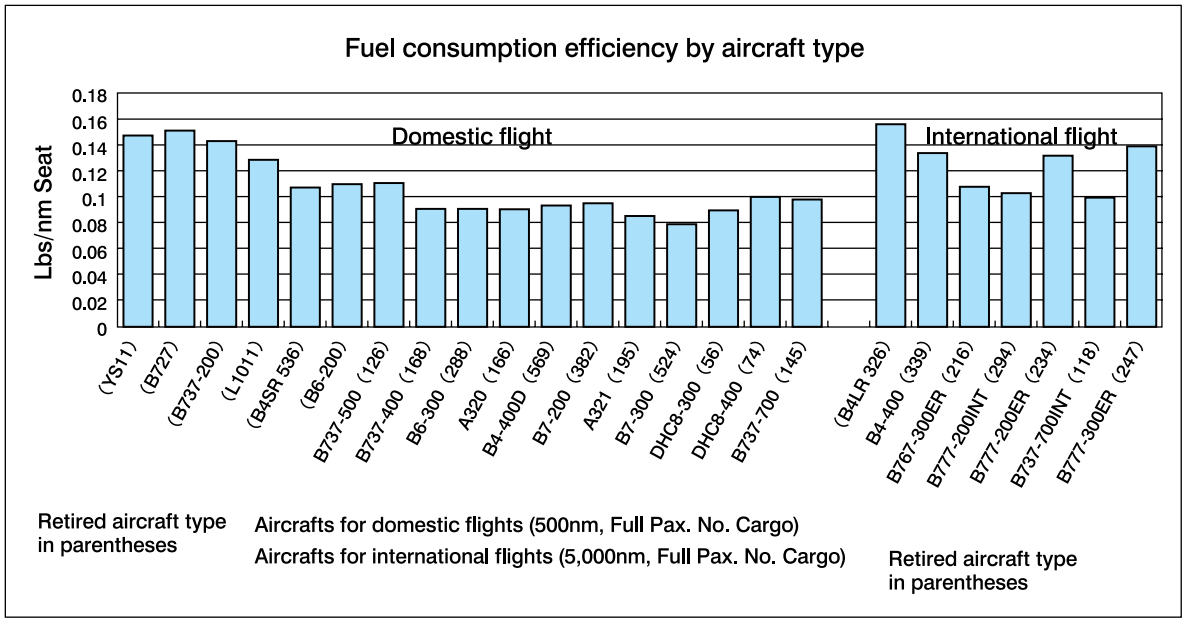


Fig. 2-3 Fuel consumption efficiency by aircraft type

The B737-700 will join our fleet as a new and powerful aircraft from Oct.2005. And from 2008, state-of-the art Boeing 787 aircraft is to be introduced.

The table below shows the introduction/retirement year of each aircraft.

Image Picture
Boeing 787 model.

Aircraft type	Introduction year	Retirement (scheduled) year
YS-11	1965	August 2003 (ANK)
B727-200	1969	1990
B737-200	1969	2000
L1011	1974	1995
DHC-6-300(ADK)	1974	March 2006 (scheduled)
B747SR	1979	March 2006 (scheduled)
B767-200	1983	2004
B747LR	1986	December 2005 (scheduled)
B767-300	1987	—
B747-400	1990	—
F-50(NAL)	1990	—
A320	1991	Gradually from 2005 (scheduled)
B737-500(ANK)	1995	—
B777-200	1996	—
B777-300	1997	—
A321	1998	Completed in 2007 (scheduled)
B737-400(ANK)	2000	December 2005 (scheduled)
DHC-8-300(AKX)	2001	—
B767-300F	2002	—
DHC-8-400(AKX、NAL)	2003	—
B777-200ER	2003	—
B777-300ER	2004	—
B737-700(ANK)	2005	—
B787	2008	—

Fig. 2-1
Introduction/Retirement year of ANA Group aircrafts
(gray: already retired)

Fig. 2-6
Per ASK CO_2 emissions for flight between Tokyo and Sapporo

3. Fuel reduction measures

As the reduction of fuel consumption directly leads to the reduction of greenhouse gas emissions, it is of the utmost importance that air transportation companies initiate environmental preservation measures. Since the first oil crisis of 1973 and the second oil crisis of 1979, ANA has been postulating and practicing various kinds of fuel-saving measures. The major measures still in practice today are explained in Reference 2 at the end of this chapter.

The following is the summary of our recent fuel-saving measures.

①EFP (Efficient Fuel Program) promotion project

ANA started its EFP promotion program in 2003. EFP increases fuel consumption efficiency by creating fuel-efficient flight plans involving factors such as aircraft altitude or speed, while considering weather conditions and air traffic control information. It also informs pilots on the most fuel-efficient point to initiate descent when landing at airports. We calculate the amount of fuel saved each month, and in 2004 we saved 31,300 kilolitres of fuel compared with 2002. This amount equals the amount of fuel required by B777-200 aircraft to make 2,200 round trips between Tokyo and Osaka.

②Taxiing after landing with engine 1 (or 2) stopped

In order to save fuel, ANA has been stopping engine 1 (and 2 for aircraft with 4 engines) while taxiing on runways since 1994. The decision of whether or not to stop engines is comprehensively judged on factors comprising the particular airport, weather conditions, runway situation, aircraft condition and instructions from the airport operation tower, yet when we make model calculations based on airports which have a long taxi distance (HND, NRT, KIX, ITM, OKA, CTS, FUK, SDJ), we employ an average stoppage time of three minutes with an execution rate of 50%, we can save 1,800 kiloliters of fuel annually. This amount equals the amount of fuel required for 125 round trips between Tokyo and Osaka by a B777-200.

③Recovering engine performance by washing the engine compressor

The more an engine is used, the more dust particles stick to the compressor and negatively influence fuel performance. In an attempt to improve fuel efficiency, ANA has been regularly washing compressors to maintain high engine performance since 2003. This effort has been extended to most of our aircraft in major service. We calculate that the amount of fuel saved from this washing and recovery of engine performance, is 4,000 kiloliters annually. This amount equals the amount of fuel needed for 280 round trips between Tokyo and Osaka by a B777-200.

Water washing of A320 aircraft engine

④Prioritized use of ground power source GPU

As an environmental preservation measure, ANA has been attempting to curb the use of APUs (Auxiliary Power Units) since 1990. An APU is a small on-board auxiliary unit which provides electricity as well as high-pressure gas for engine start-up and aircraft air conditioning. APUs are quite handy as they can be controlled by switch operation, yet they consume a lot of fuel. GPUs (Ground Power Units) on the other hand, use the electricity provided by local power companies, which is therefore more energy efficient. ANA tries to use APUs as little as possible, while encouraging the use of ground air conditioning systems or ground power sources.

Message from AGP Corp. (Airport Ground Power Supply Corporation)

Our company provides ground power unit service for electric power and air-conditioning to parked aircraft at the airports of Haneda, Narita, Osaka, Kansai, Chitose, Fukuoka, Okinawa and Hiroshima - thereby enabling aircraft to operate on the ground without using their APU. Through the use of our service, ANA has reduced CO_2 emissions by 74,000 tons (aircraft fuel 30,000 kiloliters / equiv. of fuel needed for 2,100 round trips between Tokyo and Osaka by a B777-200). ANA has higher GPU usage rate than other airlines, demonstrating heightened efforts in global warming prevention measures.

⑤Operation with RNAV (Area Navigation)

In June 2002, ANA began to make use of RNAV (Area Navigation) procedures. RNAV is a navigation procedure which locates positions of aircraft and assures the scheduled flight path by radio-guidance facilities, such as DME and satellites. In Japan, 49 RNAV tracking paths have been established as of May 2005. Below is a diagram of RNAV (conventional procedure shown on the left; RNAV on the right). Not only does RNAV achieve faster and shorter flight processing while reducing fuel consumption and engine exhaust, but it also contributes to noise reduction around airports during the night.

RNAV was set for the flight path to Hakodate, Itami, Takamatsu, Fukuoka, and Kagoshima airports in 2004. The amount of fuel saved from the shortened path to those five airports is 1,700 kiloliters annually. This amount equals the amount of fuel needed for 120 round trips between Tokyo and Osaka by a B777-200. ANA will make further efforts to expand the use of RNAV inside and outside Japan.

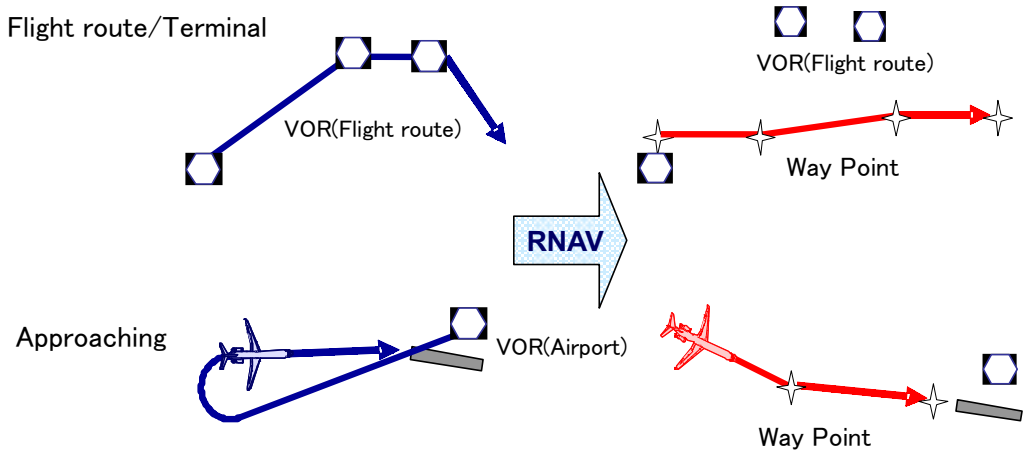


Fig. 2-7, Image of RNAV

⑥Reducing fuel consumption by simulators

For many years, ANA has been using flight simulators to train and evaluate flight crews in an attempt to reduce fuel consumption (CO_2 emissions) and to reduce noise as well as for the purpose of making the most of limited available space. In 1971, the regulatory authority approved the use of the YS-11A flight simulator to replace actual-flight training. Due to other relaxations of relevant regulations and also performance improvements in simulators, almost all flight training and evaluation now takes place in simulators. Simulators are also used for maintenance training and evaluation.

We estimated the fuel savings of 2004 achieved through using simulators for training and evaluation of flight crews and maintenance mechanics. Assuming that each simulator was used for 42,126 hours and replacing these hours with actual aircraft usage time, and subtracting the electricity used for the simulators, 301, 462 kiloliters of fuel (742,801 tons of CO_2) was saved annually. This amount equals 9.7% of the amount of fuel required for all flights (domestic, international and others) of ANA Group in 2004, and is equal to the amount of fuel needed for 21,000 round trips between Tokyo and Osaka by a B777-200.

Aircraft simulator at the training center

Section 2 Saving office energy consumption

In 2004, ANA group consumed 45,474 kiloliters of energy (crude oil equivalent) for ground operations, including maintenance and vehicle utility. This accounts for 1-2% of total energy consumption including aircraft fuel. This breaks down as follows: electricity (75%), vehicles (13%) and others which includes oil, gas and heat provision for the facilities. Electricity use accounted for the largest share, with consumption of 128.14 million KWH (crude oil equivalent of 33,957KL), which was 9.67 million KWH (7%) less than in 2003 and resulted in a cost saving of JPY 95 million. The contributing factors for the reduction are:

①Energy-saving activities within the group were successful, resulting in 70% of 40 offices and business locations recording less consumption than the previous year

②By improving the air conditioning system of large-size computer rooms, business centers experienced less consumption (-16%)

③Energy-saving efforts of the Narita Airport branch, the Crew training center and ANA Aircraft Maintenance

Reduced energy consumption (compared with fiscal year 2003)	
Business Center*	△455万KWH
Narita Airport branch	△166万KWH
Crew training center	△82万KWH
ANA Aircraft Maintenance	△122万KWH

* including the reduction of ANA Aircraft Maintenance by office relocation

Please see the ANA Group Environmental Data Book for the annual energy consumption of group companies.

Reference 1. Summary of IPCC Special Report

(1) In response to a request by the ICAO, IPCC assesses the effect of aircraft on climate and atmosphere zone, both in the past and in the future (2050).
(2) Global passenger air travel, as measured in RPK, is projected to grow by 3.1 to 4.7% per year in average between 1990 and 2050, whereas total aviation fuel use (CO_2 emission) is projected to increase by 1.7 to 3.8% per year.
(3) The range of increase in total aviation carbon dioxide emission to 2050 would be 2.6 to 11 times the value in 1992.
(4) Emission of carbon dioxide by aircraft were about 2% of anthropogenic carbon dioxide emissions in 1992 and will be 3% of the projected total anthropogenic carbon dioxide emissions in 2050. The best estimate of the radioactive forcing, the perturbation to the energy balance of the earth-atmosphere system, in 1992 by aircraft is about 3.5% of the total radioactive forcing by all anthropogenic activities. Radioactive forcing by aircraft in 2050 will be about 5% of the radioactive forcing by all anthropogenic activities (the effect of possible change in cirrus clouds is not included).
(5) Over the period of 1992 to 2050, the overall radioactive forcing by aircraft (excluding that from cirrus clouds) is a factor of 2 to 4 larger than the forcing by aircraft carbon dioxide alone. The overall radioactive forcing for the sum of all human activities is estimated to be at most a factor of 1.5 larger than that of carbon dioxide alone.
(6) CO_2: The range of increase in aviation emissions to 2050 would be 1.6 to 10 times the value in 1992.
(7) Nox: The Nox emissions are estimated to have increased ozone (O_3) concentrations (in northern hemisphere) in aircraft NOx emissions are expected to decrease the concentration of Methane (CH4) that are global in extent.
(8) Water vapor (H_2O): For subsonic aircraft this effect is smaller than those of other aircraft emissions such as carbon dioxide and NOx. For high speed civil transport (HSCT) aircraft, accumulations of water vapors in stratosphere affect warming on the globe surface. Accumulation of stratosphere water vapor is estimated as supersonic aircraft.
(9) Contrails: Contrails are triggered from the water vapor emitted from aircraft and their optical properties depend on the particles emitted or formed in the aircraft plume and on the ambient atmosphere conditions. Contrails tend to warm the Earth's surface, similar to thin high clouds. In 1992, aircraft line-shaped contrails are estimated to cover about 0.1% of the Earth's surface on an annually averaged basis with larger regional values. The contrail cover is projected to grow to 0.5% by 2050. The radioactive effect of contrails is similar to that of CO_2 and O3, but still uncertain.
(10) Cirrus Clouds: Extensive cirrus clouds have been observed to develop after the formation of persistent contrails. The mechanisms associated with increase in cirrus cover are not well understood and need further investigation. An increase in cirrus cloud cover tends to warm the Earth's surface.
(11) Sulfate (Sox) and Soot Aerosols: The aerosol mass concentrations resulting from aircraft are small relative to those caused surface sources. Increase in soot tends to warm while increases in sulfate tend to cool the Earth's surface. The direct radioactive forcing is small compared to those of other aircraft emissions.
(12) Impact of Supersonic Aviations: Supersonic aircraft consume more than twice the fuel per passenger-km compared to subsonic aircraft. The radioactive forcing of civil supersonic aircraft is estimated to be about a factor of 5 larger than that of the displaced subsonic aircraft. The addition of a fleet of civil supersonic aircraft by 1,000 aircraft is projected to add a further 40% increase of radioactive forcing. Most of the additional forcing is due to Accumulation of stratospheric water vapor.
(13) Aircraft and Engine Technology Options: A 40 to 50% improvement in fuel efficiency is projected with the prolonged engine life expectancy, the average improvement rate is expected to be smaller in the year 2050.
(14) Operational Options: Improvement in air traffic management (ATM) and other operational procedures could reduce aviation fuel burn by between 8 and 18% (the air traffic management improvements are already incorporated in the aircraft emissions scenarios used for climate change calculations). The large majority (6-12%) of those reductions come from ATM improvements which is anticipated will be fully implemented in the next 20 years.
(15) Regulatory: Economic and Other Options: Policy options to reduce emissions further include more stringent regulations, environmental levies (charge and taxes), emission trading, modal shift (substitution of aviation by rail and coach) and so on. Some of those approaches have not been fully investigated or tested in aviation and their outcomes are uncertain.

Reference 2 Major Fuel Saving Measures

	Fuel saving measure items	Contents
1	Suitable approach and departure method for Kagoshima airport	Improvement of departure and approach method: To revise Standard Instrument Departure (SID) method and Standard Arrival Route (STAR), and to shorten the route in order to reduce the fuel consumption.
2	Profile of descent to New Chitose airport RWY01	
3	Selection of suitable approach method and shortening radar inducement route in Kumamoto airport	
4	Improvement of radar inducement route in Fukuoka airport	
5	Change of Matsuyama airport departure route	
6	Passing through the test and training area of the Air Self Defense Forces	To shorten the route distance by passing the area on weekends (Saturdays, Sundays and National holidays) in which the ASDF does not train.
7	Selected the best cruise speed	To save the fuel by optimizing the cruise speed
8	Selected the cruise altitude	As the altitude is raised, fuel efficiency improves at 1% per 1,000 feet.
9	Delayed Flap approach	To delay the use of landing flap, which creates a lot of air resistance, when approaching the airport in order to reduce fuel consumption.
10	Use of low flap angle	To use a low flap angle that decreases the air resistance in order to save fuel

Major fuel saving measures (1/2)

	Fuel saving measure items	Contents
11	The best bleed air management (Reduced Pack Flow Operation)	Air for the air conditioner is taken from the engines directly; therefore by carefully controlling the airflow from the engine, we can optimize the engine performance to increase fuel efficiency.
12	Unnecessary engines are shut down when taxing	Stopping unnecessary engine use after the landing to taxi in.
13	Engine start during push back	The aircraft used to be pushed back to the taxiway after all engines are started but from now on the engines will be started during push back.
14	Standardization of Max. Climb Thrust (MCLT) use	To stop the use of delayed thrust, and to use the thrust more efficiently to reach higher altitude sooner to increase the fuel efficiency.
15	The best effect approach	An effective approach by the idling pass planning leads the fuel saving
16	Optimization of the loading fuel process	Reviewing and improving the fuel loading standard leads the higher fuel efficiency
17	Further reducing the Auxiliary Power Unit (APU) operation	Using a Ground Power Unit (GPU) instead of an APU to power the air conditioner as much as possible before the departure and after the landing will save fuel.
18	Using a flight simulator for flight crew and mechanic training	Using the flight simulator for the flight trainings, the co-pilot periodical check and aircraft tests. The training of ground crews for engine operations is done with Ground Simulator instead of actual engine. Air for the air conditioner is taken from the engines directly; therefore by carefully controlling the airflow from the engine, we can optimize the engine performance to increase fuel efficiency.
19	Removal of Brake Cooling Fan and drinking water cooler, reduction in the amount of drinking water and other weight reduction measures	Parts of a brake cooling fan and water cooler are removed to reduce weight after their use was deemed unnecessary. Reduction in the amount of drinking water carried on each flight. Switch to lighter products: meal trays, meal carts, seat cushions, passenger seats, carpets, LCD flat screens, bassinets, oven racks and life jackets; change the cloth towels to the proper towels and switch to lighter plastic cups. Reduce the number of following items loaded: blankets, utensils, wet towels and etc by loading just enough at each departure point. Also, reduce the number of cockpit manuals and spare copies of the in-flight magazine Wingspan.
20	Introduction of FMS/R-Navigation methods on domestic routes en route (Airport terminal area)	Reduction of domestic and international flight path distances due to R-Nav route setting after 1990. R-Nav operations introduction around airports, first in domestic and then in other countries, after 1997 to reduce flight distance and time.
21	Reduced Vertical Separation Minimum (RVSM) operation on international flights	ANA adopted a vertical separation of aircraft by 2000ft instead of 4000ft in the year of 2000 on the north pacific routes. From 2002, ANA applied this procedure to all flights to Europe, Southeast Asia and Canada (after 2005 in Japan and US). As a result, ANA can save several hundreds pounds of fuel per flight.
22	Revised fuel quantity onboard in international flight plans (New Contingency Fuel)	New Contingency Fuel Method (load 5% fuel instead of 8.5% of burning) changed from Re-clear started 2002, and save 2 to 3 thousand Lbs fuel at NRT-EU flight.
23	Reduction of flight route distance at the Kansai to Haneda Route	Flight route via Suzuka mountains was changed in 2001 and saved 6 minutes and 2000Lbs (B747-400) of fuel per flight.
24	Substantial introduction of VNAV approach (continuous descending)	The procedure is to maintain higher altitude until airport vicinity, and apply continuous descent from higher altitude to reduce noise and save energy. ANA started the implementation of this procedure at the new Chitose airport runway 19 using B777, B767, B747-400 and at the Hiroshima airport runway 28 using A320/321. In 2005, trials are made at Haneda, Nagasaki and Kansai airports. We intend to apply this approach to other airports as well.

Major fuel saving measures (2/2)

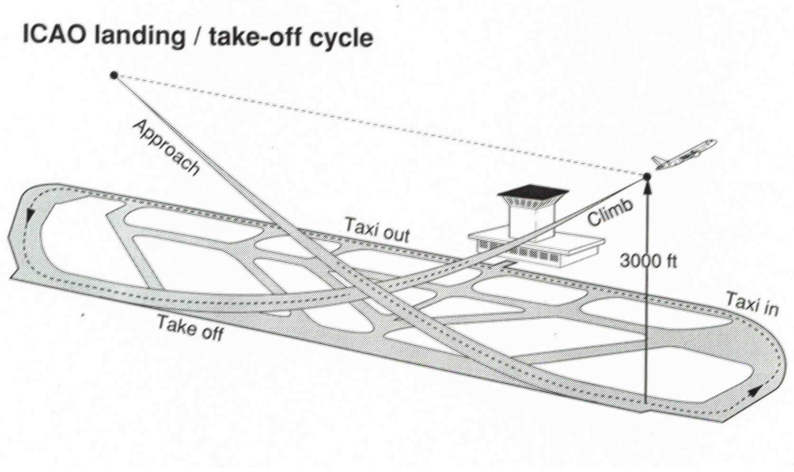
Chapter 3　Air Pollution

＜ANA's commitment and achievements＞

With the withdrawal of the YS-11 of ANK in 2003, ANA Group no longer possesses any controlled CFCs (chlorofluorocarbons). Aircraft fire extinguishers contain halon, and the companies that ANA entrusts for maintenance works are now equipped with halon recycling systems, so there are no emissions.

The relationship between air transportation and air pollution

ANA's activities connected to air pollution include mainly (1) exhaust from aircrafts and (2) exhaust from ground vehicles. As for aircraft exhaust, the ICAO (International Civil Aviation Organization) sets emission standards in its Appendix 16, for Nox (Nitrogen oxide), HC (Hydrocarbon), CO (Carbon Monoxide), SN (smoke density) emitted during the LTO cycle (a cycle which simulates aircraft takeoff and landing).
Japan Aviation Law also sets the same standards in Appendix 3 of the enforcement regulations entitled "emission standards for aircraft operations".



Measuring emission levels during engine operation (1) aircraft descending from 3,000ft to the ground, and (2) aircraft climbing to 3,000ft after takeoff.

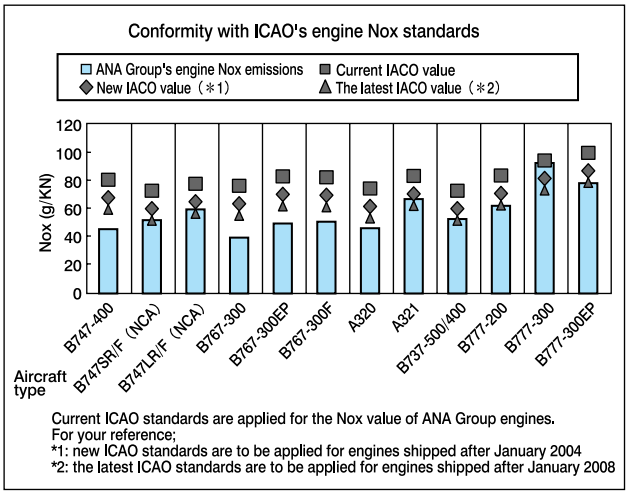
Section 1　Reduction of HC emissions during aircraft operation

1. Introduction of low-emissions aircraft

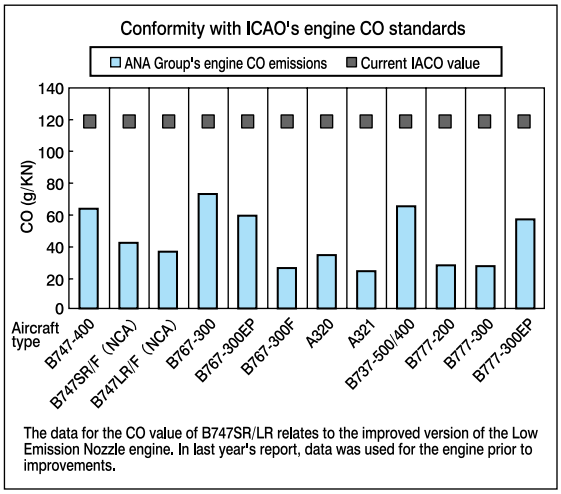
As the most effective measure to reduce hazardous exhausts from aircraft, ANA has been introducing the latest aircraft equipped with advanced engines. Fig. 3-1 shows the exhausts that the ANA Group and NCA fleet produce, with comparisons for each substance with ICAO standards. Engines currently in service at ANA satisfy ICAO standards, with the few exceptions of small-scale manufactured engines which are planned to be retired by 2006.

The regulations controlling Nox emissions have been tightened several times in the past. Nox emission levels of the ANA group / NCA fleet satisfy all ICAO standards. For your reference, the diagrams also show the new ICAO standards which are to be applied only for the new-type engines to be introduced to service after January 2004* and after January 2008**.

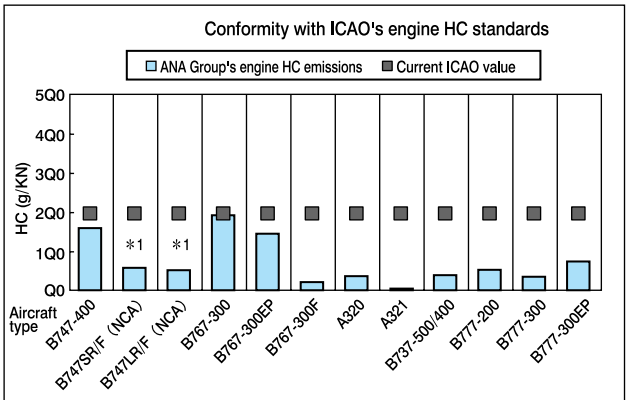
Fig. 3-1 Aircraft exhausts of ANA Group/NCA fleet and ICAO emission standards



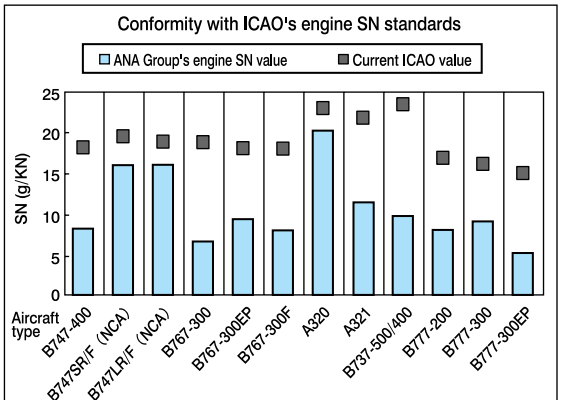
Current ICAO standards are applied for the Nox value of ANA Group engines.
For your reference;
*1: new ICAO standards are to be applied for engines shipped after January 2004
*2: the latest ICAO standards are to be applied for engines shipped after January 2008



The data for the CO value of B747SR/LR relates to the improved version of the Low Emission Nozzle engine. In last year's report, data was used for the engine prior to improvements.



*1 although some aircraft fail to satisfy ICAO standards, they are exempted as small-scale manufactured engines.



The data for the SN value of B747SR/LR relates to the improved version of the Low Emission Nozzle engine. In last year's report, data was used for the engine prior to improvements.

Conformity with ICAO

The above compares aircraft exhaust levels of the ANA Group and NCA with ICAO standards.
Engines currently in service at ANA satisfy ICAO standards, with the few exceptions of small-scale production engines, which are planned to be retired by 2006.

"Current ICAO standards" are what actually in force now. *1 and *2 show the new and the latest ICAO standards planned to be implemented in the future.

The engine exhaust level of the ANA Group and NCA in 2004

	ANA	ANA Group (ANK, AJX included) and NCA
Nox (Nitrogen oxide)	5,100 tons	6,500 tons
HC (Hydrocarbon)	1,000 tons	1,100 tons
CO (Carbon Monoxide)	4,900 tons	6,100 tons

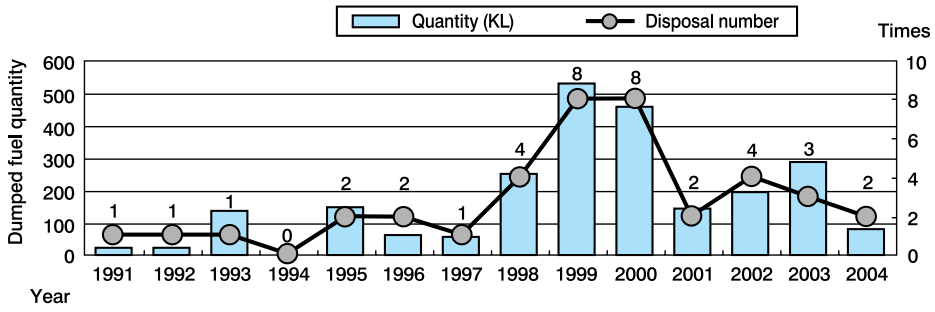
2. Improvements in operations

As measures to control emissions in operations, ANA has implemented various approaches including decreasing APU (Auxiliary Power Unit) use, shortening engine rest runs on the ground and actual flight training, and maximizing grounded flight training through the use of simulators. These measures are more related to fuel-saving issues, and are explained in Chapter 2 "Global Warming".

Fuel dumping in the case of unexpected landing

In fiscal year 2004, the ANA fleet was forced to dump fuel twice, resulting in approx. 83 kiloliters of fuel being dumped.

Fig. 3-2 Frequency and quantity of fuel dumping



Among four instances of fuel dumping reported for the fiscal year of 2003 (in the Environmental Report 2004), one of them happened in 2004. The diagram on the left shows the corrected figures.

Fuel dumping is initiated in the event that:

An aircraft is forced to make an unexpected landing due to any mechanical malfunction or due to passengers needi immediate medical care. In such circumstances, the aircraft inevitably needs to dump fuel to reduce its weight order to ensure a safe landing. Different airports designate specific dumping locations and altitudes, such as ov oceans, to avoid fuel dumping over urban areas. If dumped at higher altitudes, fuel becomes a diffuse mist, whi therefore has minimal impact at ground level.

Section 2 Introduction of low-pollution vehicles

Promotion of exhaust reduction measures for airport ground vehicles (Nox, SPM)

As of the end of fiscal year 2004, ANA Group was using 2,126 vehicles of various types (towing cars, power unit cars, maintenance crew vehicles, forklifts, etc.) in Japanese domestic airports, and has been making efforts to update its automobile fleet in favor of lower pollution cars. As of March 2005, ANA has a total of 252 low-pollution vehicles (12% of all ground vehicles), of which 28% are electric (battery operated) cars, natural gas cars and hybrid cars and 72% are low-emissions cars (certified also for low fuel consumption).

Although ground service/airport handling cars are not targeted in the diesel-powered vehicles regulations of the Tokyo metropolitan government, the ANA group has been positively updating its car fleet with regulated cars. Haneda airport especially, was upgraded with gas-powered cars last year, and contributed to the large increase of low-emissions cars in the ANA Group.

Light car first introduced to Haneda airport

(December 2004)

Hybrid car at line maintenance center

(June 2005)

In December 2004, coinciding with the grand opening of the Haneda Airport Terminal 2 Building, ANA Group introduced nine light cars for communication purposes. This move was a first in the airline industry, and the result of eased regulations pertaining to vehicles used inside airports. ANA Group is also striving to stop engine idling as a measure to reduce car exhausts and energy consumption.

Chapter 3 Ozone layer protection measures

Ozone depleting substances include fluorocarbons, hydro fluorocarbons, methyl chloroform, trichloroethane and carbon tetrachloride. The ANA group sets the below 4 categories for ozone depletion substances, and promotes the use of alternatives and improvements in the way such substances are handled.

Ozone depletion substances related to airlines are;

1. those included in the equipment of the aircraft itself
2. those used during aircraft maintenance
3. those used in maintenance vehicles
4. those used in the buildings ANA uses

1. Those included in the equipment of the aircraft itself

Below are our measures concerning fluorocarbons and halons in aircraft equipment.

① Rain-repellent gas cylinder

Previously, a designated fluorocarbon solution (CFC 113) was used as a rain repellent for aircraft cockpit glass. Once it was proved that the removal of such a solution would not cause any aircraft safety problems, ANA abandoned use of the system with the exception of the YS-11, for which no alternative method was found. However, with the withdrawal of the YS-11 in August 2003, ANA ceased to possess any designated fluorocarbons.

② Air chillers (cabin refrigerators for the storage of food items)

In 1999, ANA completed its change of refrigerant type from designated fluorocarbons (CFC12/CFC113) to an alternative, non-regulated substance (HFC134a). In addition to this, ANA-commissioned maintenance companies are equipped with recovering/recycling systems for these non-regulated alternatives in order to achieve total zero emissions.

B747-400D, B777 and A320 aircraft make use of ice-chilled carts, which are ANA's own invention. As a result, they have never needed to be equipped with refrigerators.

③ Water coolers

Water coolers were in use only for B747SR and B767-200 aircraft at ANA, and were making use of a designated fluorocarbon (CFC12). ANA removed them in 1995, substituting them in favor of the use of mineral water only.

④ Fire extinguishers

・Use of fire extinguishers in training exercises

Cabin crews regularly hold fire drills in preparation for potential cabin fires. For such drills, ANA has begun to use dummy extinguishers or water extinguishers instead of actual halon extinguishers as of 1993, while also utilizing visual training methods based on the use of video tapes. The dummy extinguishers are designed to be almost the same as the real ones in terms of appearance, weight, handling method and duration, and they also have sufficient fire extinguishing capacity. Through these modifications we avoid the unnecessary release of halons into the atmosphere.

Fire drills using dummy extinguishers

・Measures taken during the inspection and maintenance of fire extinguishers installed onboard the aircraft

Halon fire extinguishers loaded in cargo rooms and passenger cabins are inspected and maintained regularly by ANA-commissioned companies. And by installing halon recovery equipment at these companies, ANA has eradicated halon release (for halon type 1301 in 1998, and halon type 1211 in 2004) achieving no emissions of halons overall.

2. Those used during aircraft maintenance

Designated fluorocarbons and trichloroethane, which were previously used in aircraft maintenance, were eliminated in 1994 in accordance with the reduction plan prepared in 1990. Alternative cleaning agents such as an alkali agent have replaced them.

3. Those used in maintenance vehicles

Together with ANA's attempt to update its vehicle fleet, GSE cars which use refrigerant fluorocarbons for air conditioning have been replaced with alternatives. Furthermore, all vehicle maintenance companies of the ANA Group (ANA Motor Service, Osaka Airport Motor Service, and Narita Engineering Service) are licensed to handle fluorocarbon recovery.

4. Those used in the buildings ANA uses

Halon fire extinguishers are installed in transformer rooms and computer rooms of ANA buildings. In the development of new buildings or refurbishing of existing ones, ANA installs new-type extinguishers which do not contain halon. In addition, we keep tight management over these extinguishers to avoid unnecessary releases other than in emergency.

Montreal Protocol

The "Montreal Protocol on Substances that Deplete the Ozone Layer" was adopted in 1987 out of the necessity to protect the ozone layer. Since then, the regulation has been strengthened by revising the protocol five times by 1999, based on new scientific findings. The production of halon was suspended at the end of 1993, and that of chlorofluorocarbon, trichloroethane, and carbon tetrachloride were suspended at the end of 1995. Production of CFC substitutes, will be mostly suspended by the end of 2019.

Japan enacted the "Ozone Layer Protection Law" and ratified the Montreal Protocol in 1989.

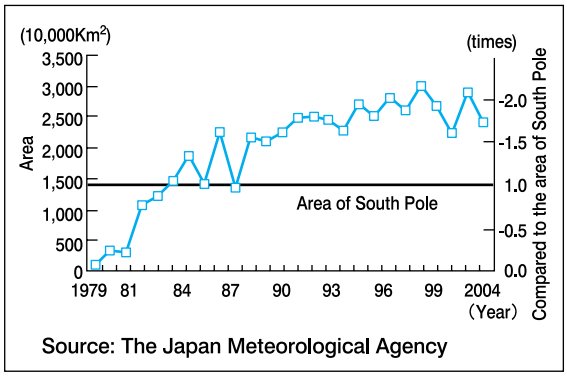
The following statements are taken from the UNEP report (United Nations Environment Program) 2002.

① In the troposphere, the total quantity of ozone layer depleting substances has been decreasing slowly after its peak in 1992-1994.

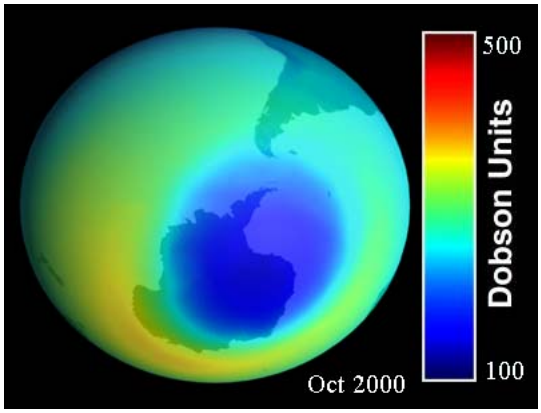
② Stratosphere observation shows that the amount of chlorine is at, or close to, its peak level, while the amount of bromine is presumably still increasing.

③ The Montreal Protocol appears to be having an effect, and it is currently expected that ozone depletion caused by regulated substances may begin recovering within the next 10 years. Although some postulate that the hole in the ozone layer is likely to have disappeared by the middle of the 21st century even if the Protocol is adhered to, it is realistic to state that the ozone layer will continue depleting over the next 10 years even despite total adherence to the Protocol.

Transition of ozone hole over the South Pole



Source: The Japan Meteorological Agency



Ozone hole as of Oct. 2000 photographed by satellite

Chapter 4　Noise

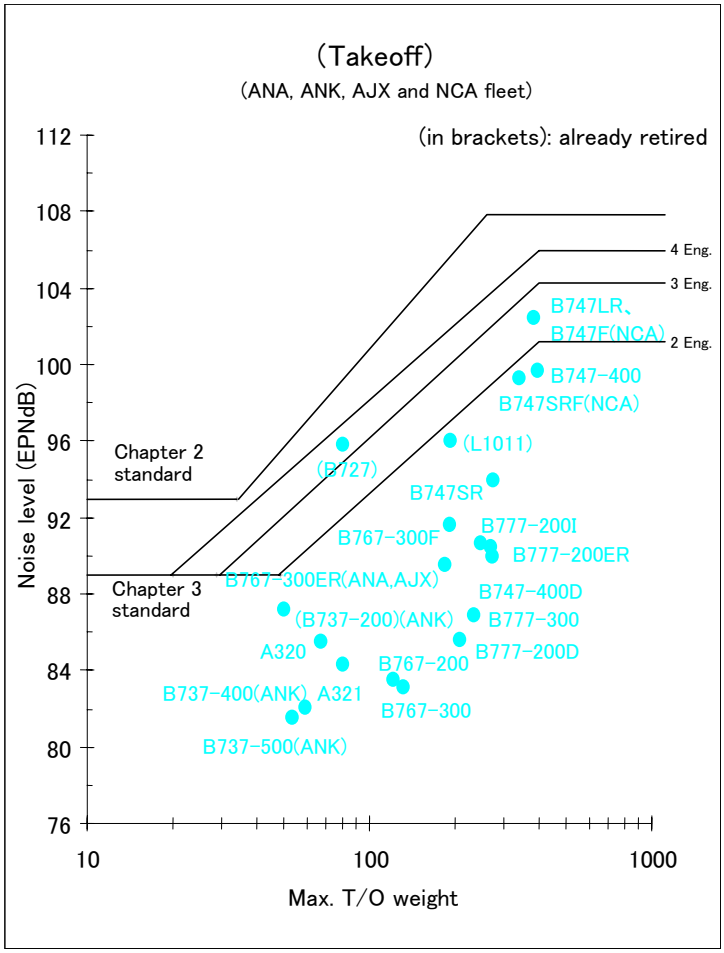
＜ANA's commitment and achievements＞
As "the Ecology Plan" declares in noise reduction section, ANA targets to have all its fleet to meet ICAO Chapter 4 noise standards. ANA is planning to achieve this by withdrawing B747LR and B747SR aircraft by Dec. 2005 and Mar. 2006 respectively, which meet only Chapter 3 standards.

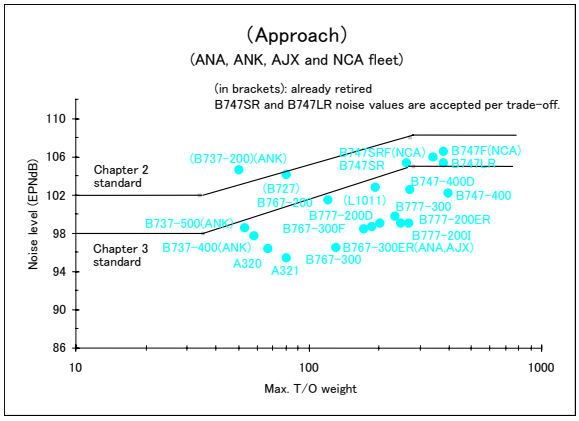
The noise related to airlines can be categorized as follows. The most influential one among these is flight noise, for which ANA has set a goal of adopting ICAO Chapter 4 standards for all its aircraft as determined in the Ecology Plan.

Categories for noise
1. Flight noise (engine noise during takeoff and landing)
2. Ground noise
① Aircraft engine operation noise on the ground
② APU (Auxiliary Power Unit) operation noise
3. Others (ground vehicles, maintenance factories, etc)

The ICAO Chapter 4 noise standard

ICAO (International Civil Aviation Organization) Annex 16 determines the noise standard for semi-sonic jet airplanes. The initial standards were the Chapter 2 standard and the Chapter 3 standard, with the latest Chapter 4 standard being the strictest to date, which is to be applicable for the new airplanes after January 1st, 2006.





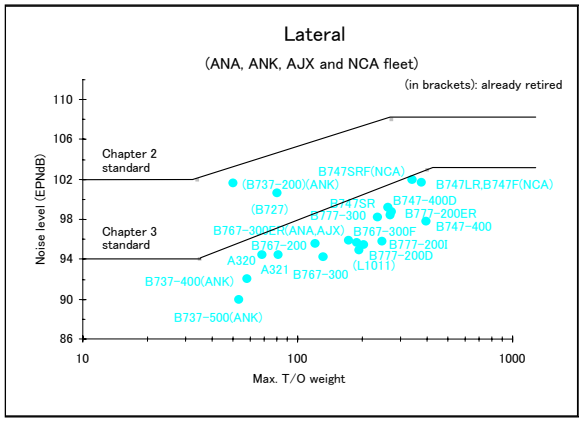


Fig. 4-1
All aircraft of the ANA Group fleet meet Chapter 3 standards.

ANA's aircraft have performance meeting the strictest standard that is Chapter 4. The aircraft which satisfies only the Chapter 3 standard (the B747SR/LR and the B747F of NCA) is scheduled to be withdrawn in the future (the B747SR/LR by the end of 2006).

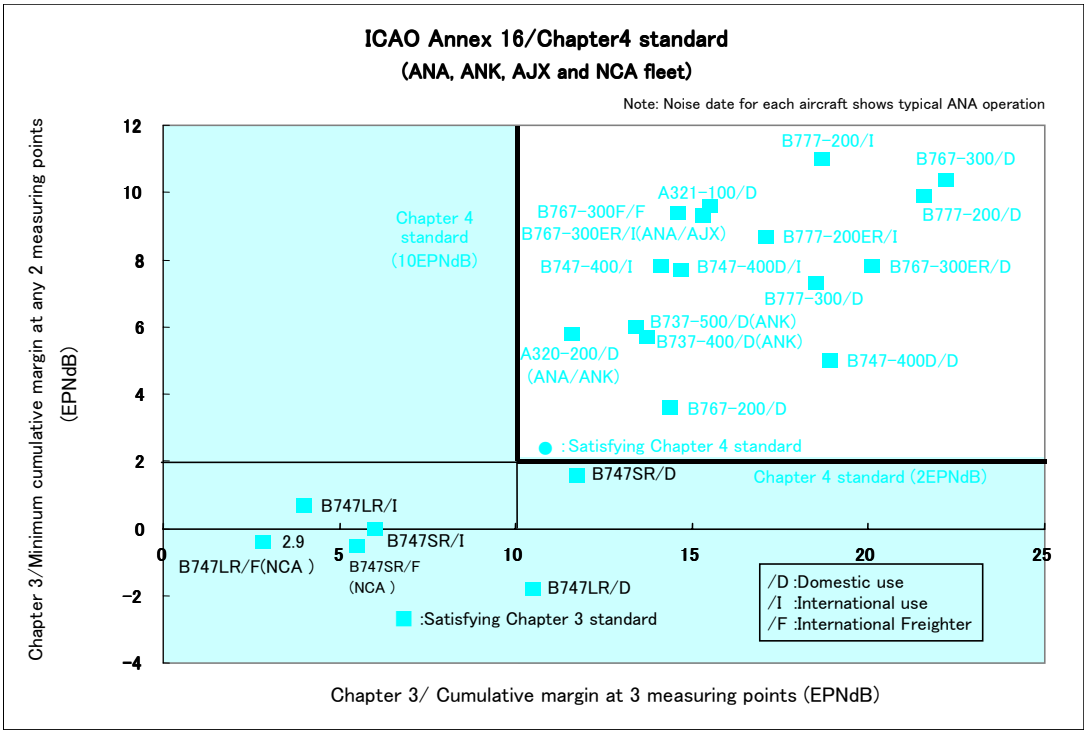


Fig. 4-2 ANA Group noise level and ICAO noise standards (Chapter 4)

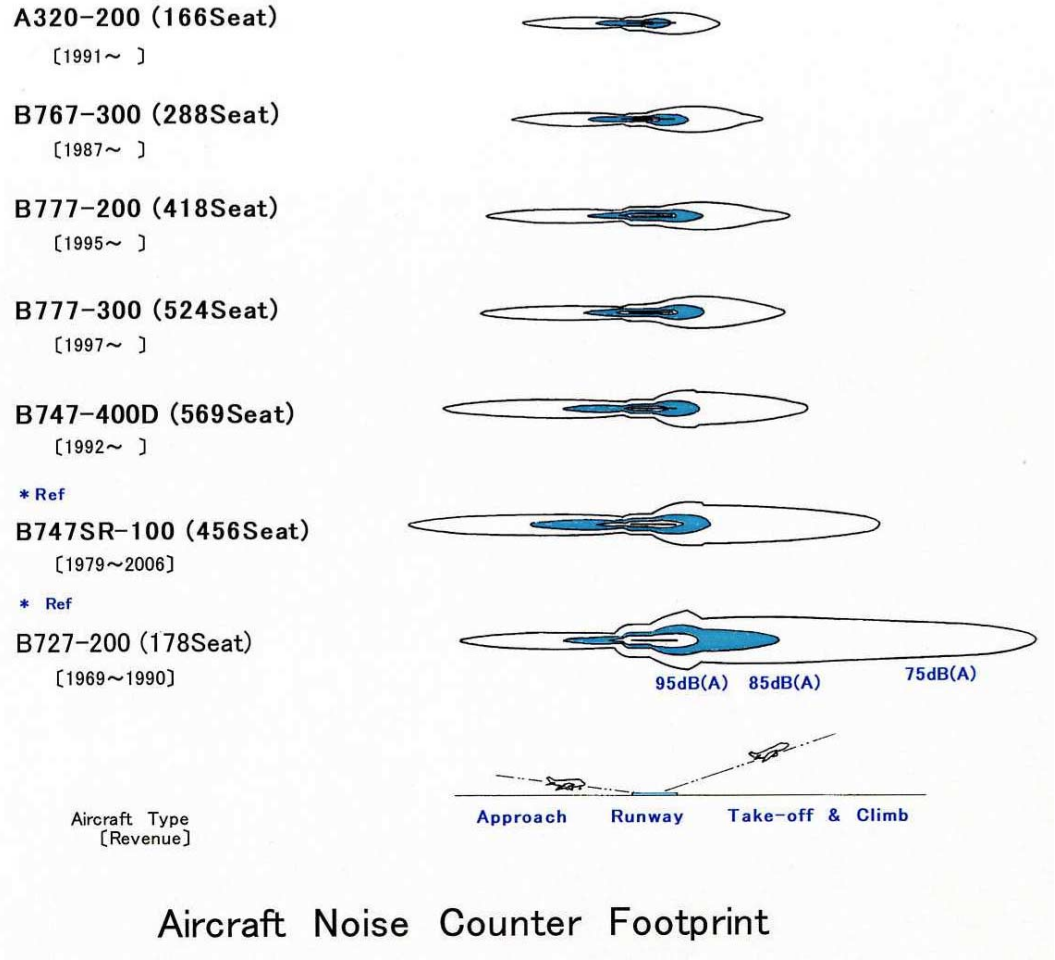


Fig.4-3 Comparison of noise contour by aircraft type

＊ Noise contour describes the noise influence range by connecting points of the same noise level

The diagram above shows that the noise range of the latest aircraft, the B777-300 (75dB), is several times smaller than that of the B727, which was retired in 1990.

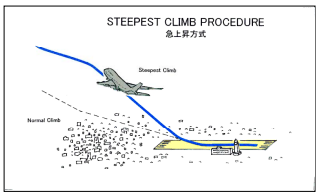
Section 1　Flight noise mitigation

1. Improvements on flying procedures

ANA has been examining various flying procedures to decrease noise reaching the ground.

ANA's noise abatement procedures

Procedure		Description
Takeoff	Steepest climb procedure	Continue a steeper takeoff ascent to a higher altitude than usual (to 3,000ft, so as to keep noise contained to the airport region as much as possible, while controlling noise by attaining high altitude in residential areas (refer to the figure 1)
Landing	Delayed flap-down approach procedure	Delay flap-down and landing -gear-down operations to reduce air resistance to the airframe, so as to decrease engine thrust requirement, thereby reducing noise.
	Low flap angle landing procedure	Set smaller flap angle for use during final approach to reduce air resistance to the air flame, so as to decrease engine thrust requirement, thereby reducing noise.
Landing and takeoff	Preferential runway procedure	If one side of runway does not have a residential area, then perform takeoff and landing in the preferred direction, as long as wind direction and speed permits (refer to figure 2).
	Preferential flight path procedure	In the airport vicinity (lower altitude), select flight paths that circumvent residential area as much as possible by turning, or that passes over rivers (refer to figure 3).
	V-NAV approach continuous descent procedure	During descent, maintain higher altitude until the vicinity of airport, then continuously descent, so as to control the change in the engine thrust, thereby abating noise. This procedure can save fuel as well (refer to figure 4).
	FMS/LLZ flight procedure	Use FMS/LLZ/RNAV in the airport vicinity and fly while avoiding residential areas and shortening flight path. In the case of late night landing in Haneda, avoid passing through Kisarazu (land area), and approach by taking a short cut over the ocean.



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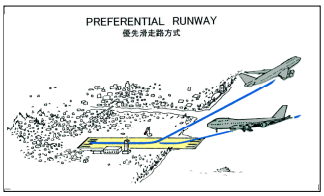

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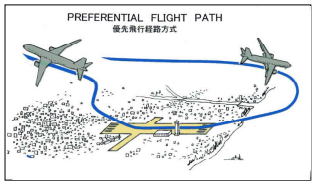

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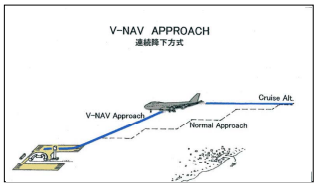


④

ANA adopted the FMS/LLZ procedures in 1999 for late night flights to Haneda Airport, and started to operate the V-NAV approach procedure at New Chitose Airport from 2003. We plan to expand the use of these procedures in the future.

2. Participation in technological development for noise reduction

In the summer of 2005, ANA participated in the QTD2 (Quiet Technology Demonstrator) which is a technology development program for the reduction of aircraft noise. This program has been established by Boeing (aircraft manufacturer), NASA (National Aeronautics and Space Administration), Goodrich (brake and tire manufacturer), GE (Engine manufacturer) and ANA, and aims to reduce aircraft flight noise through the reconfiguration of engine exhaust parts, engine air inlets and the parts around the landing gear. These new technologies will be tried out on the new model of the B777-300ER (model 3) by Boeing, and will be subjected to test flights. Once successful effects are confirmed, these advances will be brought into practical use. The future-generation model B787 will also make use of these new technologies.

ANA B777-300ER (model 3)
with noise muffling exhaust outlet

Section 2 Reduction of ground noise

ANA's ground facilities have high capacities for noise abatement to reduce aircraft noise during engine test runs.

① New engine test run facility with large noise-blocking walls (**Osaka International Airport**)

② Hangar-type noise suppression facility (**Narita International Airport**)

③ Shortening engine test run time, which must be carried out following engine overhaul, by improving the efficiency of checking procedures

Osaka International Airport

New engine test run facility with large noise-blocking walls

Narita International Airport

Hangar-type noise suppression facility (NOISE REDUCTION HANGAR)

[Reference]

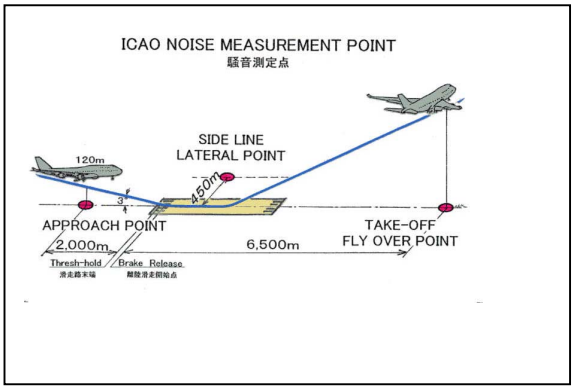
1. The ICAO Chapter 3 noise standard

Three measurement points

① Flyover reference noise measurement point
: 6.5km from the start of roll

② Approach reference noise measurement point
: 2.0km from the threshold, at altitude 120m

③ Lateral reference noise measurement point
: 450m from the runway center line



2. The new ICAO Chapter 4 noise standard (The 33rd ICAO Assembly Resolution)

① A cumulative margin of 10 EPN dB over current Chapter 3 levels (measured valued subtracted from the standard values)

② The sum of the improvements at any of the two measurement points shall be at least 2 EPN dB

③ No trade-offs are permitted

④ Applicable for new aircraft after January 1, 2006

⑤ New noise standard is only intended for certification purposes and not for the purpose of new operational restrictions such as phase-outs

⑥ Specific consideration for exemptions in the case of developing countries

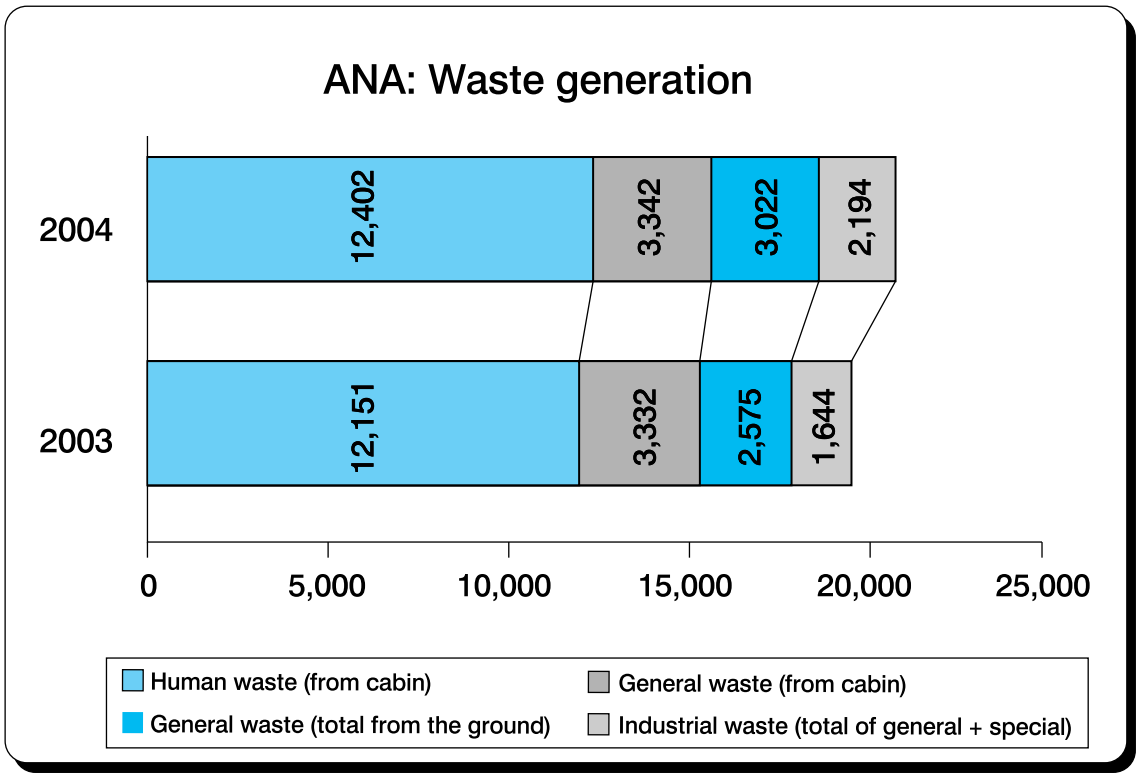
Chapter 5　Resources Management

＜ANA's commitment and achievements＞
In order to reduce the impact on the environment, the ANA group works hard to promote "3Rs" (Reduce, Reuse and Recycle), reduction to discharge hazardous substances, and enhancement of green purchasing. ANA developed the first aircraft seat cushions to be made with carbon fibers which is 100% reusable. Not only they are used in the ANA fleet, but they have also been introduced to other industries.

Section 1　Waste reduction

（1） Waste generation by ANA

ANA's actual waste production figures for fiscal year 2003 and 2004 are shown below. ANA is strongly determined to work hard in line with the concept of "3Rs" and to make beneficial use of resources by improving the recycling ratio.



ANA Group waste generation for 2003 and 2004

Human waste from passenger cabin lavatories accounted for 12,402 tons in 2004, and was the largest element of all waste generated by ANA. Others include general waste from passenger cabins (3,342 tons) and from office/business sites (2,194 tons) as well as industrial waste such as plastics (2,194 tons). All of these are treated using the appropriate disposal processes.

Also, 30,752 tons of water was used at the aircraft maintenance centers in fiscal year 2004. They were first processed using the waste water treatment system and then discharged to the public sewage system. Moreover, 14,884 tons of water was discharged from company canteens, which was also properly treated. As seen in the picture (on the right), our employees thoroughly conduct trash separation, bearing the "3Rs" in their minds.

Separated trash bins at Haneda terminal 2

(2) Reduction and re-usage of industrial waste and water conservation (usage of rainwater and semi-treated water)

ANA has adopted the following measures to reduce industrial waste and conserve water.

(Reduction and re-usage of industrial waste)

* Change the method of measuring weight and balance of aircraft (in a way that does not necessitate the disposal of fuel)
* Remold and reuse aircraft tires (maximum 6 times)
* Reuse aircraft window glass through re-painting (using overcoat method invented by ANA)
* Recycle and reuse thinners used for aircraft painting work (cleaned and re-used by delegated companies)
* Recycle and reuse activated carbon materials used for air-conditioning equipment and for the treatment of semi-treated water at hangars
* Clean engine parts with ultra-pressurized water and reduce the use of chemical agents
* Reuse appliances and equipment that became unnecessary upon the move to Haneda Terminal 2 Building at other business locations (approx. 225 tons)
* Reuse appliances and equipment which became unnecessary upon the move of Nagoya airport at the Chubu International Airport (approx. 230 tons)

(Reduction and re-usage of general waste)

* Sorting (for bottles and cans) and compression of cabin waste (international flight aircrafts such as the B747-400 and B777 equipped with waste compactors)
* Review the variety and quantity of cabin service goods (menu cards demolished for international Y-class in-flight meals)

(Re-usage of rainwater and semi-treated water)

* Reuse rainwater and semi-treated water disposed from food-producing facilities (57.6 T tons processed and reused at two locations in fiscal year 2004)

Cabin trash compactor

Waste separation by cabin crew

(3) Recycling

ANA makes strong efforts for one of the three "3Rs" – Recycling. Belows are ANA's major approaches.

① Measures at cargo department

- Collect plastic sheets used to cover air cargo containers to repel water and dust at Narita, Kansai, Haneda and Itami airports, and hand them over to recycling companies to produce solid fuel (refuse paper & plastic fuels) and plastic garbage bags
- When disposing cargo ID Plates, as used on cargo containers, delegate the recycling work to separate raw iron materials from combustible materials
- Sell disposed cargo containers to metal recycling companies, which can use them to recover raw aluminum.

② Measures at maintenance department

- Disposed of engine parts are sold to metal recycling companies as special metal materials. Accessories such as necklaces, tiepins and key holders are produced with this material and are sold for charity purposes.

- Currently attempting to recycle cabin seat covers to produce socks or blankets.

Necklace and key holder produced from recycled engine parts

(Recycling achievements)

Aircraft engine parts, aluminum waste materials	Raw metal materials	JPY 11,460,000 / year
Aircraft engine parts (Haneda)	Accessories	A few dozen / year
Plastic cargo sheets for rain/dust shielding (Haneda)	Solid fuels, garbage bags	6 tons / year
Cargo container ID Plates (Haneda)	Raw iron materials, combustible materials	220kg / year
Cargo containers (Haneda, Narita)	Raw aluminum materials	JPY 4,740,000 / year
Used air ticket stubs (all Japan)	Toilet paper	108 tons / year
Used boarding pass stubs (Nagoya, Kushiro)	Fans, signs	Approx. 2 tons / year

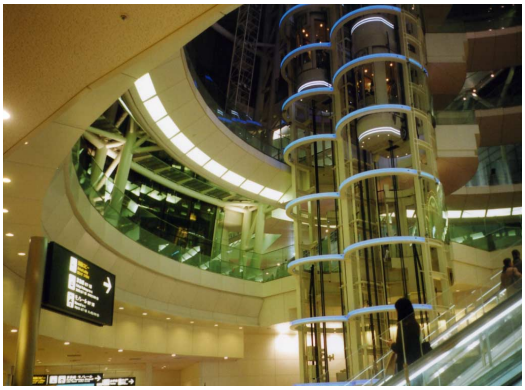
(Current attempts)

In-flight magazines, timetables	Business cards, picture books	
Cabin paper cups	Toilet paper, etc	
Aircraft seat covers	Socks, blankets	
Aircraft carpets	Solid fuels	

In December of last year, Haneda Airport Terminal 2 Building was completed and our Tokyo Airport branch, the Tokyo flight department, the Tokyo passenger office and the line maintenance center moved from the Terminal 1 Building. 225 tons of office appliances and furniture, which became unnecessary due to the move, were then taken to the Chubu International Airport newly opened in February 2005 and reused.

With the opening of Chubu International Airport, the airport office in Komaki was moved to the new airport at offshore Tokoname. Among 308 tons of items which became unnecessary, 230 tons of them were moved to the new location and continue to be used.

Chubu International Airport (opened in Feb. 2005)
Waste separation is thoroughly practiced.



Haneda Airport Terminal 2 Building (Opened in Dec. 2004)
Designed to use natural light to the maximum extent.

Section 2　Green Purchasing

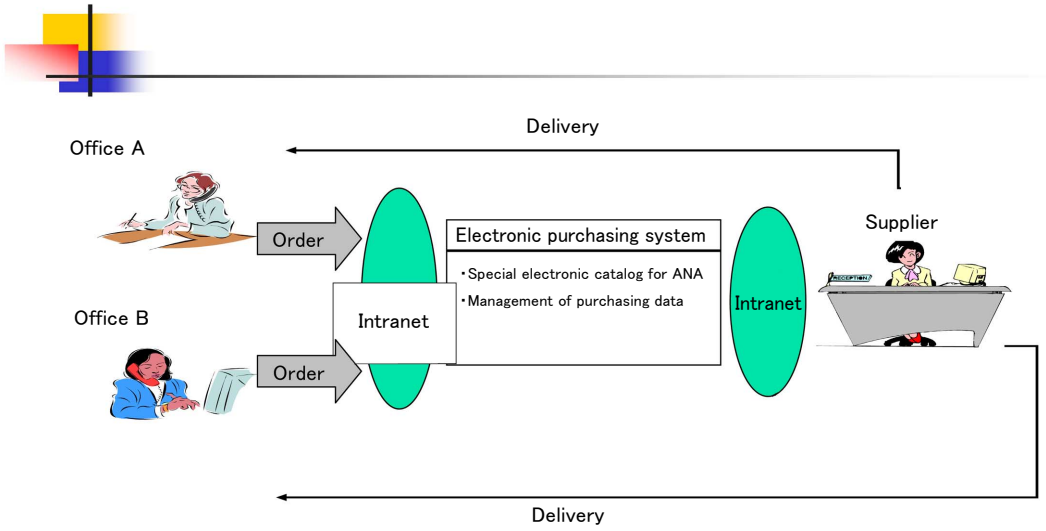
Since July 2002, ANA has been promoting green purchasing through the introduction of an electronic purchasing system for office supplies and copying paper that makes use of an intranet LAN. Ten Group companies implemented green purchasing in fiscal year 2004, and although our green purchasing ratio lowered, the purchase amount increased by 7.2% from the previous year.

ANA has also adopted a unique system which identifies office supplies, such as files, which are no longer in use at each of its offices and relocates them internally to where they are needed.

＜ANA's achievements and target for green purchasing＞

Items	2003	2004	Target for 2007
Copying paper	47%	30%	100%
Other office supplies	63%	60%	80%

For the year 2004, green purchasing accounted for 30% of copy paper and 60% of other office supplies. As the system is still in the expansion phase in the group companies, there is a considerable gap between the target purchasing ratio and the actual amount. In the future, ANA will attempt to increase the purchasing ratio and amount simultaneously, by improving the availability of goods and promoting environmental consciousness within the companies.



＜Example of green purchasing＞

ANA uses over 2,400 tons of paper for timetables (both domestic and international), yet they all are produced using 100% recycled paper. For travel brochures which require approx. 4,300 tons of paper, ANA uses 70% recycled paper. Moreover, FSC-certified paper (FSC certifies properly managed forestry materials) has been used for ANA's calendar from the year 2005 edition.

ANA in-flight magazine and timetable

FSC-SECR-0025
FSC Trademark © 1996
Forest Stewardship Council A.C.

FSC certification

Section 3 Reduction of chemical use

1. Compliance with the PRTR Law (Pollutant Release and Transfer Register)

ANA uses approx. 2,000 kinds of products that contain PRTR regulated substances, most of which are employed in aircraft maintenance. The consumption quantities of such products, however, are extremely low compared with other industries.

PRTR =
＝Pollutant Release and Transfer Register
Managing the discharge and transference of special chemicals controlled by law

In order to correctly understand and conduct required registration of these products, ANA has set up a unified inter-company database which comprehensively manages these products by kind, quantity, constituents and consumption status. Also, ANA has been attempting for further extension of this system through the group companies. ANA has instituted long-term reduction measures for its chemical use through the adoption of such a data management system and also by learning methods of the ISO environmental management system.

In fiscal year 2004, ANA used 39 kinds of such substances which was an increase by 2 from the previous year, yet the total consumption* was 25,300kg – approx. 30% less than the previous year. The contributing factors for the reduction are (1) change to the use of alternatives, (2) transient reduction in the production and (3) the year in question did not fall on a periodic replacement year for solvents.

Needless to say, ANA gives proper treatment to these substances with consideration of their potentially negative impact on the environment, and will promote further improvements by continuing research on alternative materials or methods.

＊Total of discharge (vaporized into atmosphere, to public water area or land and landfills) and transference (waste from business establishments and public sewage).

<Major PRTR substances used by ANA>

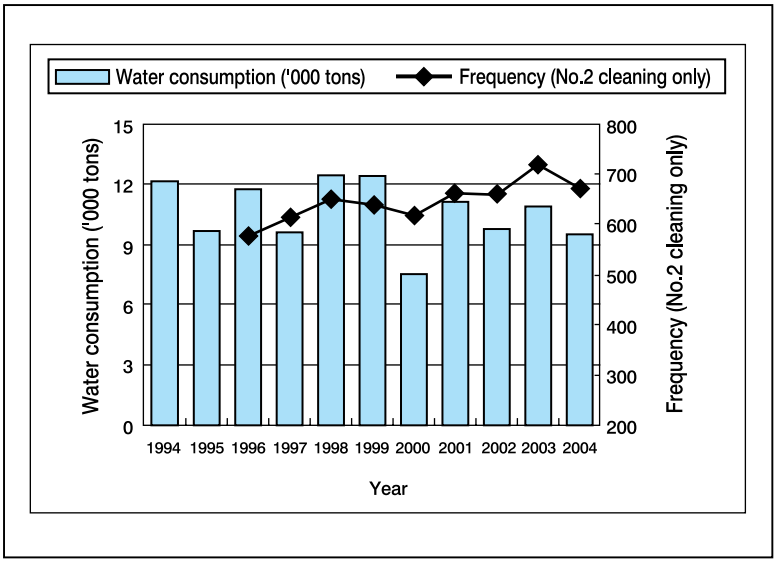
Volume rank	Consumption level	Purpose for usage	CAS No.	Improvements and others
1	Trichloroethylene	Steam washing before plating	79-01-6	Reduced by 2.5% by preventing steam diffusion and collecting liquid solution
2	Tributyl phosphate	Aircraft hydraulic fluid	126-73-8	
3	Toluene	Diluents such as those used for paint	108-88-3	
4	Dichloromethane	Paint removal prior to repainting	75-09-2	Replaced most parts with non-chlorine-based agent alternatives
5	Xylene	Diluents such as those used for paint	1330-20-7	
6	Cellosolve acetate	Thinner	111-15-9	
7	Polyoctylphenyl ether	Cleaning agent	9036-19-5	All those stated hereafter are consumed in amounts of less than 1kg
8*	Chromic anhydride (chromium trioxide)	Plating material	1333-82-0	Conducted no replacement
9	Ethyl benzene	Painting	100-41-4	
10	Manganese dioxide	Adhesive agent	1313-13-9	

* Special controlled substance Type 1 (reporting required for yearly consumption of more than 0.5t)

2. Aircraft water cleaning and discharged water processing

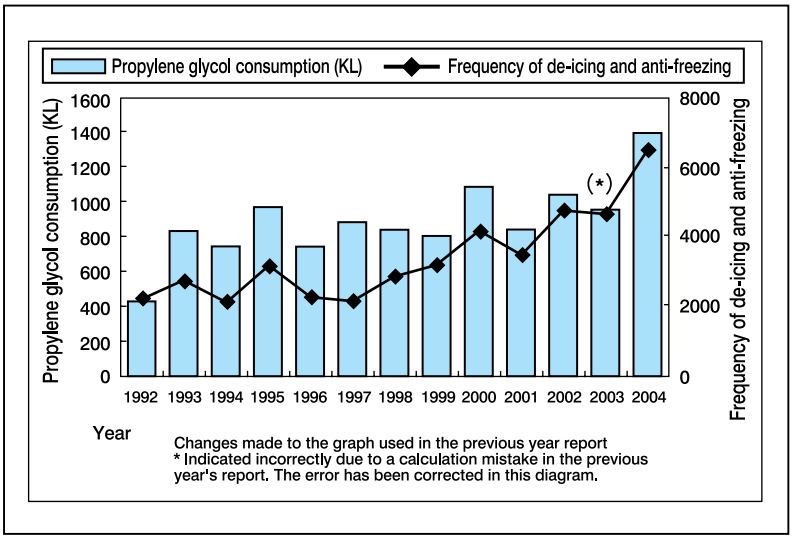
Aircraft are washed during nighttime at Narita and Haneda airports. The diagram (on the right) shows water consumption amount and frequency of aircraft washing by ANA Group. Used water is properly treated at the treatment facility in the airports and disposed to the public sewage.

Previously, ANA was using washing agent which included PRTR substances. ANA Group has reduced the usage of this by 95% in last 4 years thanks to alternative developments of the International Airport Utility, ANA maintenance head office and the technical development department.



3. Reduction in the use of anti-freezing and de-icing agents for aircrafts

For safety reasons, aircraft are not permitted to take off with snow or ice adhered to the wings, rotating blades or body. Snow needs to be blown off using large amount of hot water or compressed air (for drier snow), followed by the application of a coating of an anti-freezing agent. ANA Group has completely shifted its use of anti-freezing agent to propylene glycol (which is not subject to PRTR Law) as of 1996, and has made efforts to develop better equipment and to improve work procedures so as to reduce the amount of anti-freezing agent used.



4. Reduction in the use of PRTR substances and volatile gas for outer coating of aircraft

As a counter measure against water and soil pollution, ANA introduced a non- dichloromethane-based neutral substance (which is not subject to PRTR Law) for paint removal use. We also introduced a heating system to ANA Aircraft Maintenance costing JPY 550 million in 2002, which conducts painting work for the ANA fleet. The heating system is used to warm the airplane hangar and to maintain the temperature of paint remover used before repainting. Moreover, the "low VOC aircraft exterior paint" which was tentatively introduced in 2002 and contains less volatile gas, became standardized and all painting works have been done with this since 2004. In total, 18 aircraft were painted in 2004, and 9 of them were pained with the use of the heating system. The use of a dichloromethane-based substance was halved in 2004, and ANA is still in the process of developing more environmentally friendly substances.

Chapter 6 Social and Environmental Contribution

＜ANA's commitment and achievements＞
ANA will continue to strive for①a sustainable future ②through cooperation with local communities and ③with its employees actually participating in contributing activities. ANA's social and environmental contribution activities are named "AOZORA", which means "My Blue Sky". In 2004, ANA started its 10 years forestation program as well as the Okinawa coral regeneration program in an attempt to conserve biodiversity.

Section 1 "AOZORA" international environmental picture book contest

Grand Prize
By Mei Matsuoka (23 years old)
Title: "Ten-san (ladybird), Kame-san (turtle) and Muri-san (snail), Go Traveling"

Special prize from the head judge
By Kako Toyoshima (7 years old)
Title: "A present from the rainbow"

ANA hosted its 2nd international picture book contest with the support and cooperation of the Ministry of the Environment and the National Federation of UNESCO Associations in Japan. The aim for this contest is "to leave a mental legacy to the children – the next generation to inspire them to place greater value on the environment, nature, living creatures and natural resources", "to create opportunities for discussion about the environment among friends and family" and "to contribute to education and develop the expressive powers of children". As was the case in the previous contest, we received a broad range of applications from in/outside Japan and from small children to senior citizens. The works represented each country's situations, lifestyle and family or friends relations with rich and varied themes and use of color. Also, there were many great works, some of which expressed sentiments and feelings in a direct manner while others stimulated the imagination of readers.

Prize winner
BY Yuko Tsujita (11 years old)
Title: "Cherish Nature"

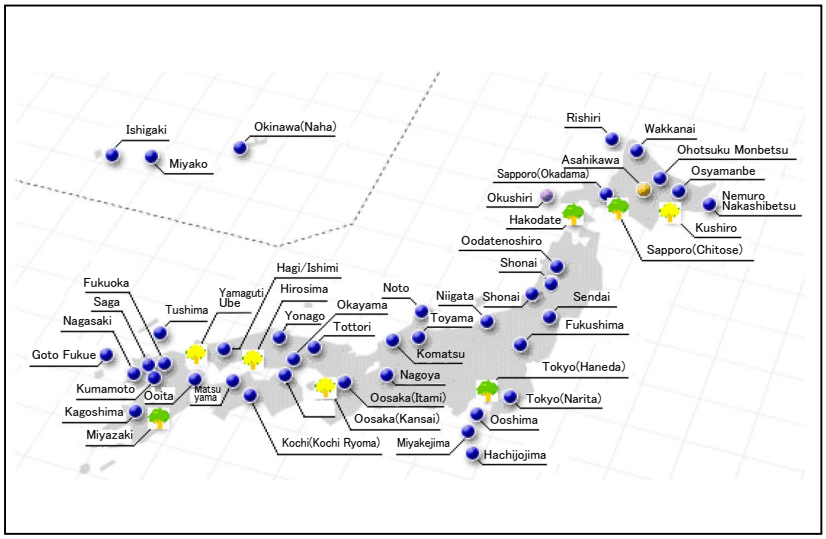
The board of review included C.W. Nicole as a head judge and other members from various fields, and by their strict and fair judgment, the grand prize (for 1 person) and other prizes (for selected people) were awarded together with a diploma of merit, a cash award/ANA miles and a commemorative gift.

The grand prize-winning work was published with a print run of 100,000 pieces and distributed not only in flights and at the airport counters, but also given to elementary schools and kindergartens as presents.

For the 3rd contest, we receive applications from the end of April 2005 until September 15th, and after the judging process scheduled for next January, we will publish the grand prize-winning work and distribute copies of it in-flight and at airport counters for free from April. Here we'd like to take an opportunity to express our gratitude for all the works we received. We hope that this contest will continue to grow with widespread support and participation.

Section 2 "AOZORA" forestation activities

ANA offers its service at 50 airports throughout Japan. We have a 10-year forestation program (including planting, nursing and promotional activities such as field forest studies) mainly targeting the areas around the airports and in cooperation with local communities, volunteers and ANA employees.



Following the start of the "AOZORA" international picture book contest in 2003, the "AOZORA" forestation program was launched in 2004 and thoroughly promoted by ANA as a major social contribution activity. The project covers 4 or 5 airports every year, and was implemented for the surrounding area of Haneda, Hakodate, New Chitose, Miyazaki and Matsuyama airports in 2004. In fiscal year 2005, ANA intends to extend the activity to overseas airports too.

Below are the achievements of fiscal year 2004 and our future plans

Fiscal year 2004 (implemented)

Airport	Where	When
Haneda Airport	Ito in Shizuoka pref.	April, October
Hakodate Airport	Oono-cho in Hokkaido	May
New Chitose Airport	Chitose in Hokkaido	July, October (Cancelled by typhoon)
Miyazaki Airport	Kitago-cho in Miyazaki pref.	October (Cancelled by typhoon)
Matsuyama Airport	Matsuyama in Ehime pref.	March

Fiscal year 2005 (implemented or scheduled)

Airport	Where	When
Kansai Airport	Takano-cho in Wakayama pref.	April
Haneda Airport	Ito in Shizuoka pref.	April
Hakodate Airport	Oono-cho in Hokkaido	May (Hokkaido Tree-planting Ceremony)
Yamaguchi Ube Airport	Ajisu-cho in Yamaguchi pref.	May
Kushiro Airport	Shibecha-cho in Hokkaido	May
New Chitose Airport	Chitose in Hokkaido	June
Haneda Airport	Shinano-cho in Nagano pref.	July
Bangkok Airport	Pagan area in Myanmar	August
Hiroshima Airport	Miyoshi in Hiroshima pref.	August
Miyazaki Airport	Kitago-cho in Miyazaki pref.	October
Bangkok Airport	Phuket in Thailand	November

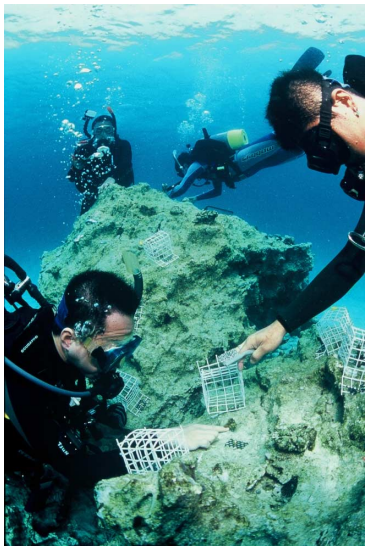
Section 3 Other activities

"Team TYURA SANGO" Okinawa coral planting activities

Team mascot character

Although corals are an important source of oxygen, coral population has been decreasing in recent years due to various factors such as rising sea temperature. ANA formed "Team TYURA SANGO" with 12 other companies inside and outside Okinawa in an attempt to regenerate corals facing crisis and also regenerate the beautiful sea of Okinawa in which many creatures are living.

In 2004, activities included an Environmental Forum which invited children from the local community and taught them about the sea as well as posing the question about the situation of the sea of Okinawa. We also implemented coral planting with the support of volunteer divers, and there is a special website which shows the growth of the planted coral.



Coral planting

Divers participating in the activity

The presenting of Suzuran – the flower of felicity

ANA has been continuing to make gifts of Suzuran flowers for 50 years as a way to convey its wishes for the recovery of hospitalized people and to show gratitude to medical personnel. In June 2005, we presented bookmarks of Suzuran to 33 medical establishments such as the Japanese Red Cross Hospital, which were created by ANA's 2,800 employees during their break times.

Presenting Suzuran bookmarks

Sign language/ Braille translation activities by cabin crew and ground service staff

Sign language badge

(for cabin attendants)

ANA has been organizing inter-company sign language lessons so that all passengers can fully enjoy their flights with us. Those who are qualified with the 4th grade of Sign Language Proficiency or above are permitted to wear the sign language badge (pictured on the left). We also provided flight support for people who participate in the National congress of the Deaf. Also, our service includes audio (tape) and Braille versions of in-flight magazines.

Donations in various foreign currencies

Fund-rising activities for UNICEF

We cooperate with UNICEF (United Nations International Children's Emergency Fund) fund-rising activities by placing a donation envelope in the seat pockets of our flights, particularly in the case of flights departing from U.S. cities bound for Japanese airports. Accepting various currencies, we were able to make a total donation of JPY 4.17 million in 2004.

Actions after April 2005

To update constantly changing ANA's activities, major activities after April 2005 are highlighted below.

Distribution of the grand prize winning work of the picture book contest (April-)

We published the grand prize-winning work of our 2nd "AOZORA" international environmental picture book contest with a print run of 100,000 copies, and distributed them in our flights and to educational establishments. We received lots of compliments for the book. For the 3rd contest, we received applications until September 2005, which are currently undergoing the judging process.

Tree and coral planting (May-)

From the beginning of 2005, we implemented forestation activities at 8 locations, Kansai (Koyasan), Haneda (Izu), Hakodate, Yamaguchi Ube, Kushiro, Chitose, Haneda (Nagano) and Hiroshima. We are planning to carry out the activity in Miyazaki and Kochi prefectures in the autumn. As for overseas locations, we planted 7,500 trees in a 10ha area near pagan, a Buddhist archeological site in Myanmar. We also planted corals in the sea of Onna-son in Okinawa with the support of the local people.

Start preparing for the introduction of the B787 (April-)

The B787 has been nicknamed the "Dream liner" for its cutting-edge engine and performance. ANA, as an environmentally friendly company, became the first to order this aircraft and placed an order for 50 last year. In preparation for the introduction after 2008, ANA has set up a special office in the Boeing Company to establish a system that will make the best use of this new aircraft along with ANA's unique concept.

Acquired "Japan first" EcoMark for the new uniform (May)

ANA acquired the "Japan first" certificate of the EcoMark standard for "clothes that can be collected and recycled after use" for its new uniform which came into use after May 1st. Also, we suspended the practice of incineration for the disposal of old uniforms, instead recycling them for use as in-car acoustic absorbent material after cutting, heat processing, pressing and taking paper templates for approx. 20 tons of wool jackets, pants and skirts.

Organize Environmental Office of Star Alliance Companies (August)

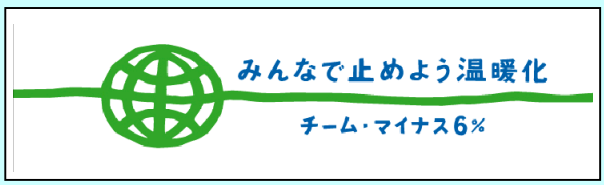
ANA has been organizing an Environmental Office of Star Alliance Companies together with Thai Airways, Singapore Airlines, Air New Zealand and Asiana Airlines. This year, we invited regional director of Star Alliance Bangkok Office, for an active discussion in Bangkok about jet gass and waste. ANA, as an environmental leading airline, thus respect regional bindings and cooperation in the Asia/Pacific region.

Co-development with Boeing Company on the B777-300 (ANA's 3rd aircraft model) for the realization of new noise-reduction technologies (July)

ANA conducted collaborative testing with Boeing on the B777-300 on new technology designed to reduce noise by developing a configuration of engine exhaust parts, engine air inlet and the parts around the landing gear. The best engineers of both companies participated in the testing and intend to use this technology for the B787.

Taking an active part as a member of "Team Minus 6%" (June)

ANA moved quickly to declare its participation in "Team Minus 6%", a national movement to reduce greenhouse gas, and has been working positively for this since June. In line with this action, ANA initiated 6 actions against global warming such as "Cool Biz".



Worldwide environmental industry movements and ANA

As aircraft is a means of transport that transcends national boundaries, it is crucial to set international rules with a global view. With growing levels of environmental awareness in the last ten years, many international rules and guidelines have been established for airline-related matters. ANA has been aiming to become an "environmental leading airline" by actively participating in groups to discuss and play an important part in international environmental measures and to take initiatives that can lead others in the industry. Here we introduce some world events related to airlines, the environment and ANA's global activities.

1. World events relating to airlines and the environment

Below are the major international organizations and groups which give influence to airlines and the environment.

UNFCCC	United Nations Framework Convention on Climate Change
IPCC	Intergovernmental Panel on Climate Change
COP	Conference of Parties
ICAO	International Civil Aviation Organization
CAEP	Committee on Aviation Environmental Protection
IATA	International Air Transport Association (Membership; airlines)
ENTAF	Environmental Task Force (Upgraded to ENCOM in 2005 (committee organization))
AAPA	Association of Asia Pacific Airlines (Membership; regional airlines)
EWG	Environmental Working Group
ACI	Airports Council International (Membership; airport authorities)

Among the above, ICAO has the strongest impact on airlines and the environment. ICAO is a specialized agency of the United Nations and has 188 member countries. Its assembly session is the supreme decision-making body of ICAO, and it is organized once in every three years in Montreal for the making of fundamental decisions regarding aviation policy for the next three years. With relation to environmental issues, its subordinate organization, the CAEP (Committee on Aviation Environmental Protection), takes charge and makes suggestions and recommendations in the assembly session after economic and technical deliberations. Originally, ICAO had set up an expert committee for the control of noise in the 1960's and for the regulation of engine emissions in 1970's. The current CAEP is the result of these two combined.

CAEP Working Group (Old and New) *Restructuring to three working groups

Working Group 1	Noise (Technical problem for noise)	Working Group 1	Technical Noise Issues
Working Group 2	Airports and Operations (Noise around airports)	Working Group 2	Airport & Operations
Working Group 3	Emissions Technical Issues (Technical problem for gas emission)	Working Group 3	Technical Emissions Issues
Working Group 4	Emissions Operational Issues (Operational problem for gas emission)		
Working Group 5	Market-based Options (Market prinolple related problem for gas emission)	MBO Group	
FESG	(Forecasting and Economic Analysis Support Group) (Estimate of economic impact and analyze of reguletional)	FESG	

Although ICAO assembly sessions and CAEP meetings take place only once in three years, it is an excellent opportunity for related parties to hold substantive discussions at meetings of Steering Group (every year) and Working Group (as-needed). ANA participates in the Steering Group and Working Group meetings and contributes to the establishment of environmental aviation policy. Working Groups of CAEP were restructured last year, and currently 5 groups have meetings to decide on detailed factors.

Year	Agreement, treaty or conference among nations	UN organizations	International airline organizations	
	UNFCCC	**ICAO assembly session / CAEP meeting**	**IATA**	**AAPA**
1992	**Adoption of Framework Convention on Climate Change** (May) Signing at the Earth Summit	**ICAO31 / CAEP2** Noise Improvement on noise proofing process Noise of rotary bladed aircraft		
1993				
1994	Framework Convention on Climate Change came into force (March)			
1995	**COP1 Berlin** 「Berlin Mandate」	**ICAO32 / CAEP3** Noise Improvement on noise proofing process Change of MTOW		
1996	**COP2 Geneva** 「GENEVA MINISTERIAL DECLARATION」			
1997	**COP3 Kyoto** **Adoption of Kyoto Protocol**(December)			
1998	**COP4 Buenos Aires** 「Buenos Aires Plan of Action」	**ICAO33 / CAEP4** Emissions/ Global warming Enforcement of NOx emission standard **Resolution of "MBO"**		
1999	**COP5 Bonn** Emphasizing the significance of Kyoto Protocol			
2000	**COP6 Hague** Discontinuance of Hague Convention **COP6 Bonn**「Bonn Agreement」		IATA fuel efficiency Circular Suggestion	
2001	**COP7 Marrakesh** 「Marrakesh Accords」	**ICAO34 / CAEP5** Emissions/ Global warming **Chapter 4 noise standard "Balanced Approach"** Approach to reduce CO_2 emissions (MBO, etc)	Emission Trading research	WG Suggestion
2002	**COP8 New Delhi** 「Delhi Ministerial Declaration」		ENTAF13	EWG1
2003	**COP9 Milan** Determination of Implementation rule of Kyoto Protocol		ENTAF14 ENTAF15	EWG2
2004	**COP10 Buenos Aires**	**ICAO35 / CAEP6** Emissions/ Global warming **Enforcement of NOx emission standard (12%)** Approach to reduce CO_2 emissions (MBO) Restructuring of WG	ENTAF16	EWG3 EWG4
2005	**Kyoto Protocol came into force** (February) **COP11 Montreal** = **MOP1** (Meeting of Parties)		ENTAF17 Organization restructuring ENCOM1	EWG5 Waste EWG6
2006	**MOP2**		ENCOM2 ENCOM3	EWG7 EWG8
2007		**ICAO36 / CAEP7**		
2008				
2009				
2010		**ICAO37 / CAEP8**		
2011				
2012				

2008～2012
First Commitment Period

Although the main theme of ICAO/CAEP may change along with evolving global circumstances, with the assembly session of 2001 placing its focus on security measures after the US terrorism attack, for example, the theme of 2004 had three main pillars, which were Safety, Security and the Environment. Especially as there had been no consensus nor firmly set ideas regarding the environment, we spent a lot of time discussing such issues. Among environmental discussions, counter measures for noise or gas emissions were generally at the center of the discussions, however global warming has taken center stage since ICAO34/CAEP5 in 2001(see p.46 for more details regarding themes). Also, please note that a new noise measure, "Balanced Approach" and the global warming-related concept of MBO (Market-based Options) have become especially important, and are explained in more detail below.

The Balanced Approach is a method to implement effective counter-noise measures by combining the measures below.

- ✧ Noise reduction from the aircraft itself
- ✧ Measures involving land areas surrounding airports
- ✧ Noise reduction cruising style
- ✧ Operational regulations

What are MBO's (Market-based options)? ･･･ Three methods which utilize market principles

① **Voluntary Measures** Agreements for reduction made between government and industry

ICAO creates model measures for discussion between government and industry

② **Emissions Related Charges** Impose environmental costs on those responsible for emissions

Conflict between European countries in favor of charge imposition and USA and other developing countries in opposition to such measures

③ **Emissions Trading** Set reduction obligations and trade rights regarding emissions

Three implementation avenues have been suggested.

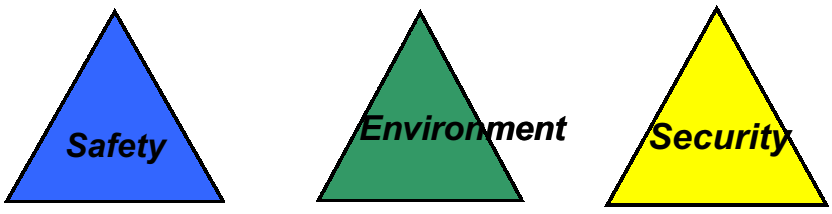
Avenue 1: Trading in the context of the UNFCCC and Kyoto Protocol ←△Europe

Avenue 2: Aviation specific system under ICAO auspices ←× people, goods, money and time

Avenue 3: An entirely voluntary trading system assisted by ICAO ←△USA

With growing concerns over the environment, worldwide environmental efforts moved into full gear in the 1990's. National-level treaty negotiations began and the FCCC (Framework Convention on Climate Change) was adopted in 1992. The UNCED (UN Conference on Environment and Development) then took a place with more than 150 participant nations, with the goals of reducing greenhouse gas emissions to 1990 levels by the end of 1990's being set. The third meeting of this framework convention was held in Kyoto in December 1997, culminating in the adoption of the Kyoto Protocol. As the protocol came into force in December 2005, the Conference of Parties (COP) changed its name to the MOP and had a new start with discussions on the operational or implementation rules of the Kyoto Protocol towards the 2nd commitment period.

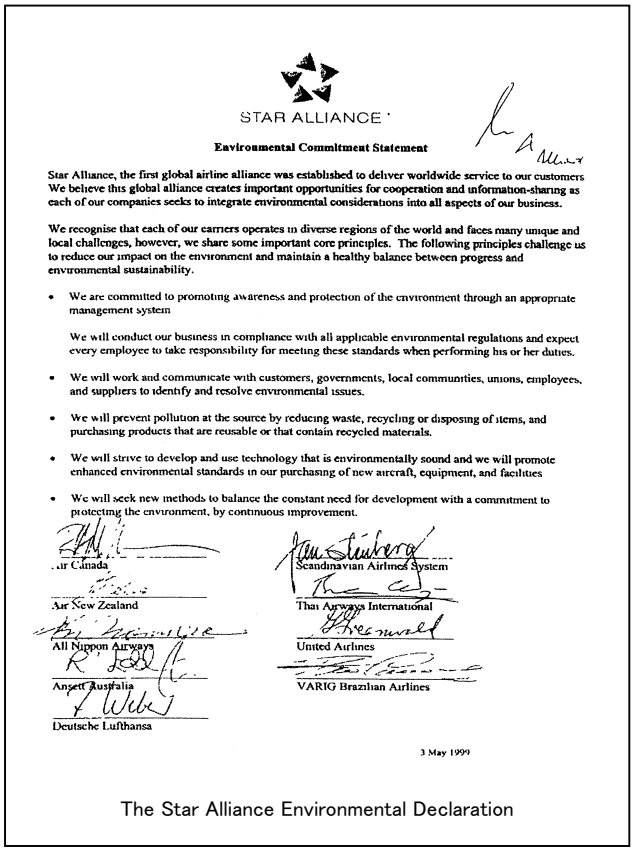
Embracing the movements of the COP and ICAO, the International Air Transport Association (IATA) became more aware of the relationship between airlines and the environment, and started taking an active part in the ENTAF working group. And through its organizational restructuring of 2005, it has been promoted to one of the top 6 committees. In 2002 the Environmental Working Group (EWG) was set up under the AAPA (Association of Asia Pacific Airlines), and has been assisting with environmental measures of airlines by providing regional viewpoints.



2. The Star Alliance and ANA's global environmental measures

With understanding on continuously changing global situations, ANA has been taking action as a company leading environmental awareness. As for the ICAO/CAEP, we participate in the Steering Meetings almost every year, and also for the Working Group – with each of these entities having a different mission. ANA has been actively involved especially in the WG5 and MBO, which develop global warming prevention measures based on market mechanisms. As for IATA, we have joined a task force, the ENTAF, and also are involved in the restructured ENCOM. And although the Asia Pacific region may show a lesser degree of environmental awareness than many nations which are not Appendix I nations of the Kyoto Protocol, ANA has taken a chief role to set up EWG (environmental working group) in AAPA and has now grown to the stage where it holds on a regular basis. In July 2002, we were invited to the international convention of the UNEP (United Nations Environment Programme) as a panelist, and we continue to contribute more and more opinions to the airline industry.

ANA giving a presentation on its own measures for environmental management in the 3rd EWG (May 2004)



STAR ALLIANCE

Environmental Commitment Statement

Star Alliance, the first global airline alliance was established to deliver worldwide service to our customers We believe this global alliance creates important opportunities for cooperation and information-sharing as each of our companies seeks to integrate environmental considerations into all aspects of our business.

We recognise that each of our carriers operates in diverse regions of the world and faces many unique and local challenges, however, we share some important core principles. The following principles challenge us to reduce our impact on the environment and maintain a healthy balance between progress and environmental sustainability.

- We are committed to promoting awareness and protection of the environment through an appropriate management system

  We will conduct our business in compliance with all applicable environmental regulations and expect every employee to take responsibility for meeting these standards when performing his or her duties.
- We will work and communicate with customers, governments, local communities, unions, employees, and suppliers to identify and resolve environmental issues.
- We will prevent pollution at the source by reducing waste, recycling or disposing of items, and purchasing products that are reusable or that contain recycled materials.
- We will strive to develop and use technology that is environmentally sound and we will promote enhanced environmental standards in our purchasing of new aircraft, equipment, and facilities
- We will seek new methods to balance the constant need for development with a commitment to protecting the environment, by continuous improvement.

Air Canada
Scandinavian Airlines System
Air New Zealand
Thai Airways International
All Nippon Airways
United Airlines
Ansett Australia
VARIG Brazilian Airlines
Deutsche Lufthansa

3 May 1999

The Star Alliance Environmental Declaration

ANA is a member of the Star Alliance, which is an alliance of civil airlines. In May 1999, we signed the "Star Alliance Environmental Declaration", and together with other nine airline companies we clarified our commitment to the environment. Although we developed the EAG (Environment Advisory Group) as promised in our declaration and held various meetings, the series of terrorist acts of 2001 placed some of the member companies in management difficulties and as a result the EAG fell into a dormant state. Seriously concerned with this situation, ANA set up the Star Alliance Asian League with Singapore Airlines and Thai Airways in the same year, which was later joined by Asiana Airlines and New Zealand Airlines. Now we chair the organization and organize meetings every year. The central organization of the Star Alliance also joined our attempts in 2005, which enabled us to discuss developments on a global level.

In addition, ANA made an environmental presentation for Thai Airways and is strongly determined to keep its active movements as an airline leading environmental awareness.

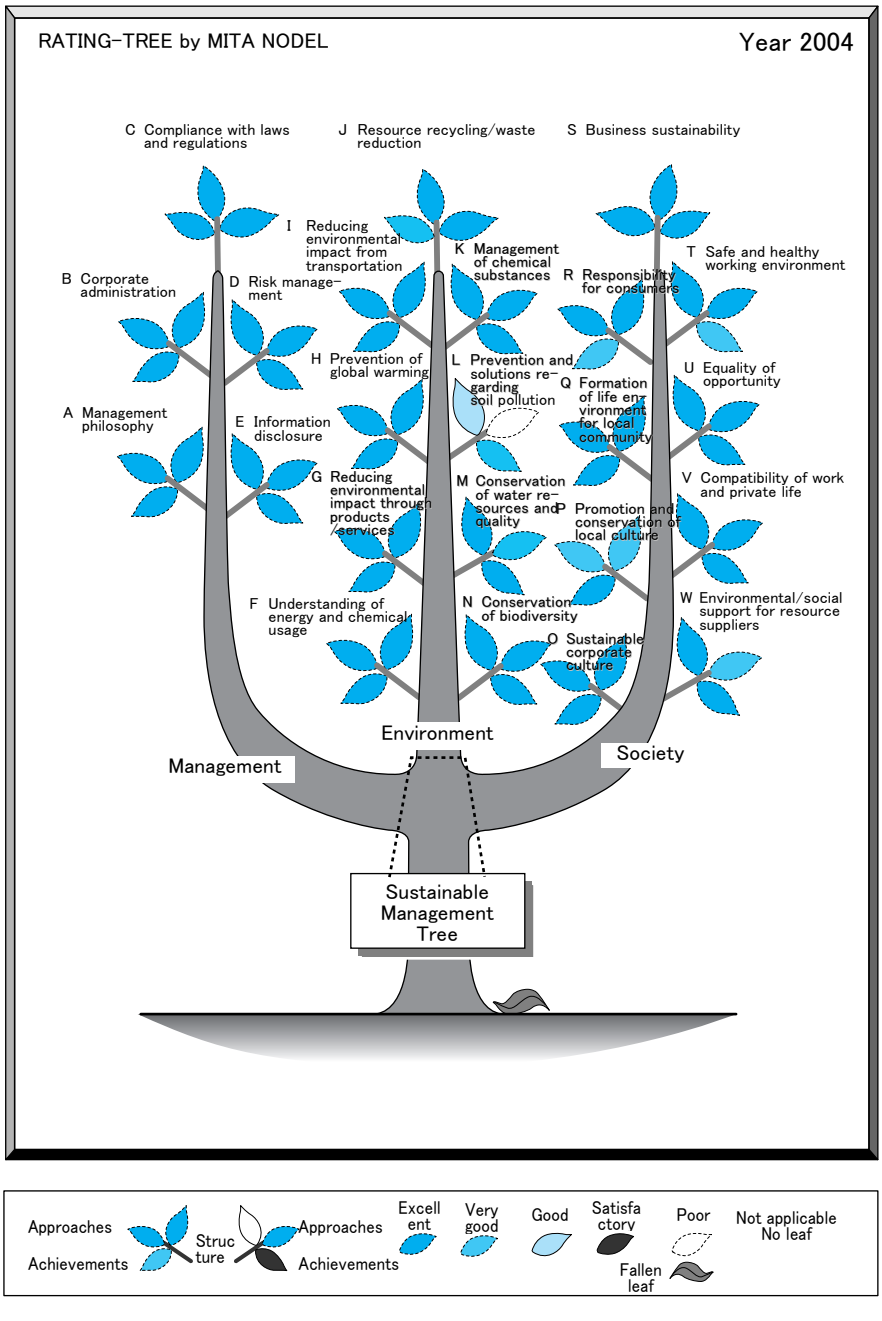
ANA's Look from Outside

We listen to opinions from wide-ranging people and use the ratings by external institutions to improve our future performance. Never being satisfied with the current status, we are always seeking improvements and we'd very much appreciate your frank opinions on our daily and environmental performance.

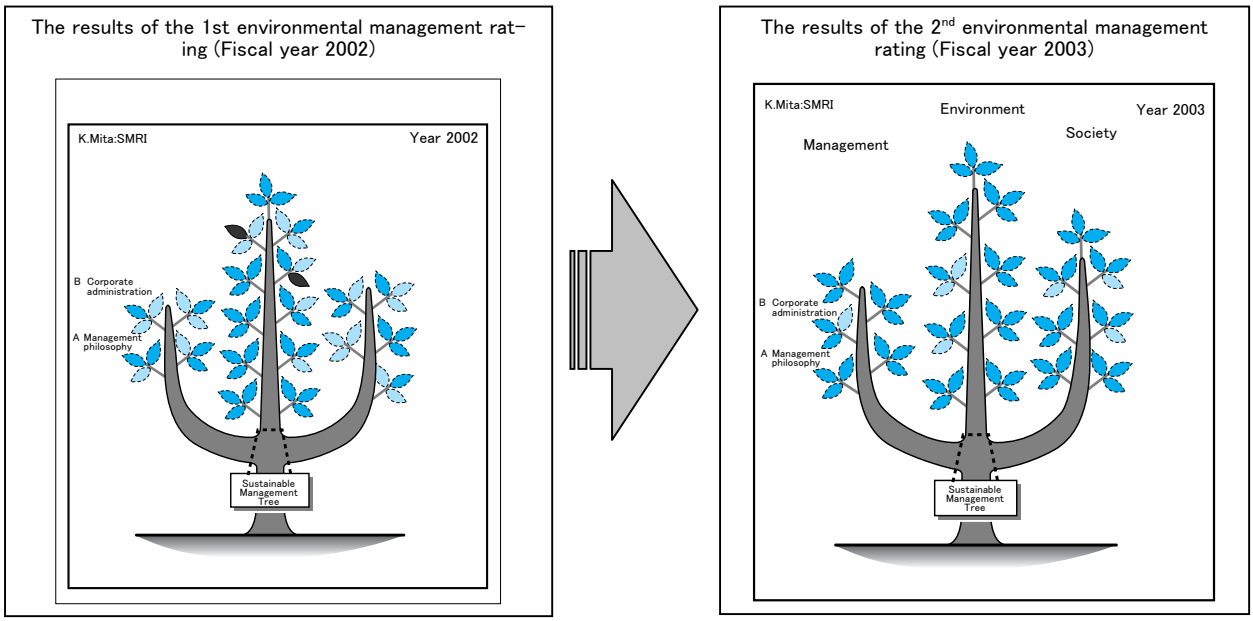
1. Evaluation by grading organization

(1) Grading for environmental management

The results of 3rd environmental management rating (Fiscal year 2004)



ANA has been participating in the Sustainable Management Rating Program, run by the Sustainable Management Forum of Japan (a non-commercial corporation which accesses and investigates environmental management). This rating program describes three main categories of evaluation (Management, Environment and Society – the so-called Triple Bottom Line) representing them as tree trunks. Each branch represents an evaluation item with three leaves which show the grading of approach, structure and achievement. The assessment is accurately and strictly done based on documented evidence and the results are shown in 4 different colors (green, greenish-yellow, yellow, red) and fallen leaves. This rating method is called the "Mita" method. Above are our rating results for 2004.



(2)International corporate environmental performance assessment by Innovest (USA)

ANA also receives assessments from Innovest, which offers ratings on international corporations. Among 13 global major airlines which include Lufthansa Airlines, British Airways and Air France, we have been graded as being the 5th best, which is Grade A and the highest in Asia.

2. Official commendations and other achievements

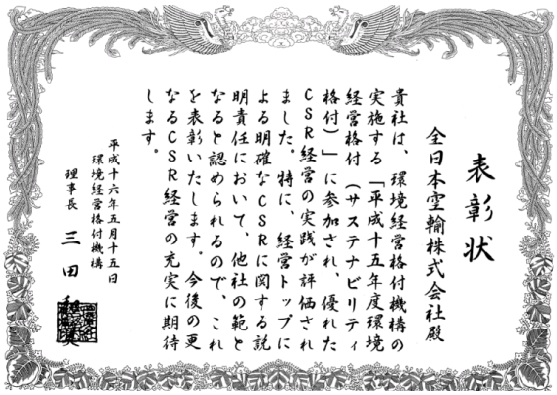
Letter of appriciation from the state minister for the environment

On February 5th, 2005, ANA received a certificate of application from the state minister for the environment. The certificate was given to three organizations including ANA (the other two were "Wa-no-kurashi O-endan" and "20th Century Fox". This is because we have been given high marks for our activities such as the "AOZORA" forestation program, the international environmental picture book contest, and for broadcasting global warming related videos on our international flights.

Feb. 5th, 2005, ANA received a certificate of application from the state minister for the environment

Best Practice Award by Sustainable Management Forum of Japan

In May 15th, 2004, in recognition of our before-mentioned year 2003 results of the Sustainable Management Rating Program, we received a Best Practice Award as we were chosen as one of the best 11 companies among 75 assessed companies for our clear accountability by top management on CSR.


表彰状

全日本空輸株式会社殿

貴社は、環境経営格付機構の実施する「平成十五年度環境経営格付（サステナビリティ格付）」に参加され、優れたCSR経営の実践が評価されました。特に、経営トップによる明確なCSRに関する説明責任において、他社の範となると認められるので、これを表彰いたします。今後の更なるCSR経営の充実に期待します。

平成十六年五月十五日
環境経営格付機構
理事長　三田

GEF Encouragement Prize for ANA's Environmental Report of fiscal year 2004

At the Awarding Ceremony

2005 年 1 月 20 日

ANA has been issuing its environmental report since 1993, and last year we entered the Environmental Communication Awards organized by the Global Environmental Forum (GEF) for the first time. We received the Encouragement Prize for our report conveying our sincere attitudes towards society and corporate responsibilities in a clear manner.

3. Questionnaire results from readers

Questionnaire results from report readership

About ANA's Environmental Report 2004
The important parts were difficult to distinguish by boldface letters alone
ANA's sincere and serious activities are clearly explained with pictures, diagrams and etc.
It gave me good impressions as the report shows the honest opinions of a third party.
The abbreviation list was of great use.
The website is easy to read, using a clear blue as a base color.
Regarding ANA's environmental and social contribution activities (including the website)
The International environmental picture book contest can give great opportunities for children to learn the importance of nature
Environmental efforts will never be pointless. ANA should keep its attitudes toward the environment.
I highly appreciate that ANA works hard not only against global warming and noise, but also toward recycling and social contribution activities.
I highly appreciate ANA's forestation program (introduced in the website).
ANA's long time communication efforts have been constantly extending and progressing
About other communication tools other than the Environmental Report
"ANA VISION" (the report for shareholders) was also enclosed with the Environmental Report, which gave me the impression of ANA being a sincere corporation.
The grand prize-winning work of the environmental picture book contest was enclosed. It was beautifully made and I look forward to the future development of this contest.

4. Third party opinion of ANA

Asia-pacific Coalition for Environment
Chairperson Prof. Yujiro Yeguchi

ANA's Environmental Report of this year places further emphasis on corporate management policies and environmental management. ANA has developed a firm structure for environmental management that excels among those of major global airlines, and I see its huge prospects for the future as a global company that places core importance on the environment. Based on this, but also taking into account the fact that ANA is a global airline which represents Japan and aims for further growth, I would like to speak here specifically about their efforts relating to the environment.

The airline industry operates with a high burden on the environment in the form of the mass consumption of fossil fuels and the consequent CO_2 emissions released mainly to the stratosphere. For this reason, comprehensive, wide-ranged and advanced environmental management is essential.

This year, ANA's environmental report has 6 chapters based on the "ANA 5 year Ecology Plan", clarifying the theme of each chapter with "ANA's commitment and achievements". Also the fact that the plan discloses the accumulated data of its 20 and more affiliate companies is a milestone attempt for a global airline company.

1. The report features it clarifies the structure of ANA's long-term environmental management

   With the scheduled introduction of the B787 (50 aircraft) from 2008, ANA possesses the rights of the launching customer (through co-development). The development of fundamental specifications bearing in mind the need to reduce environmental impact and the need to reduce unnecessary flights through the effective use of medium-sized aircraft will also contribute toward cost savings, and form a core of environmental management such as realization of related technologies. I highly value this decision by the top management.

2. The key to resource recycling are the waste 3Rs (Reduce, Reuse and Recycle)

   ANA has developed the world's first aircraft seat cushion that is 100% re-useable and the use of this cushion is also extended to other airlines. Regarding the reduction of chemical usage which is a fundamental assignment for all businesses, ANA has set stringent targets and action plans. With the PRTR Law (registration for the emission and transportation of hazardous substances) being enforced, ANA is going ahead with the institution of concrete measures to meet the future standards of this law, and this is highly evaluated as a part of efficient environmental management.

3. Expansion of environmental communication through cooperation with NPOs, industry, government and academia

   A prime example of ANA's efforts is the way in which they promote their forestation program by taking onboard the insights of experts, in cooperation with the Kyoto University Field Scientific Education Research Center.

4. As a company leading environmental awareness, ANA needs to clarify its overall strategy more and refine it

   With the expansion of its environmental management, and by revising its environmental policy and adding further empirical data, ANA needs to explain its environmental attempts in a clearer, more detailed manner.

5. As also pointed out in the last year's report, ANA's role as a Star Alliance member is important

   Although ANA had attained the great achievements relating to the Star Alliance Asian League, it seems there was not much progress in 2004. ANA has more experience and achievements in environmental management and social contributions compared to other member airlines. The conditions for ANA to extend its activities on global scale are being established, and ANA should show its leadership more in the Star Alliance and act as an engine for change, especially in Asia.

I look forward to the next year's environmental report, and hope that my opinions are taken into consideration.

Environmental NGO　Asia-Pacific Coalition for Environment (ACE)

ACE is an environmental NGO that aims to establish an economic and environmental bloc in Asia to promote the sustainability of humans and business. The coalition makes proposals and promotes projects for environmental and economic management and diplomacy. Recently the coalition has extended its activities to include environmental diplomacy actions, such as setting the 3R measures for Japan as well as the Environmental Peace Project, Eco-Tourism, and the Asian-Pacific Children Conference in the three Middle-Eastern countries (Palestine, Israel, Jordan).

Abbreviations

ACI Airport Council International: The ACI was established in 1991 and is the international association of the world's airports.

AEA Association of European Airlines: Cooperative body for European airlines.

AESA Atmospheric Effects of Stratospheric Aircraft Flyer

APU Auxiliary Power Unit: APU ensures an aircraft's energy supply and air conditioning when no infrastructure is available on the ground. Also it provides pressurized air for engine starting

ASK Available Seat Kilometers: The available number of pressure seats multiplies by by the distance flown in kilometers.

ATEC Association of Air Transport Engineering and Research:

BAU Business As Usual: Executing business processes without taking measures to prevent global warming.

BOD Biochemical Oxygen Demand: Total Amount of oxygen consumed in the biochemical process to decompose organic constituents present in the water.

CAEP (ICAO) Committee on Aviation Environment Protection: CAEP is a technical committee responsible directly to the ICAO Council.

CFC Chlorofluorocarbons: Certain halogenated hydrocarbons used for fridge/freezer's refrigerant and detergent for washing electronic parts. It is best known under the trademark Freon includes chlorines and fluorosis. It is an ozone depletion substance as well as a greenhouse gas.

CH_4 Methane gas which has the smallest molecular ass out of all hydrocarbons. There are two sources CH4; first of a natural source, from swamps and lakes, second is a man-made source from leaks of natural gas, livestock, agriculture fields and landfills. It is considered that CH4's greenhouse effect is 21 times worse then CO2's effect. Aircraft NOx Emissions are expected to decrease tropospheric methane concentration.

CNS/ATM Communications, Navigation and Surveillance Systems for Air Traffic Management
CNS uses Data-link with phonetic communication system for the conveyance of the data and messages.
ATM reduces some procedures for the management to provide more appropriate routes for aircraft within the limited space.

CO Carbon Monoxide: Toxic and combustible gas formed by incomplete burning of substances containing carbon, e.g. fossil fuels.

CO_2 Carbon Dioxide: Gas resulting in nature from the burning or decomposition of organic ,asses and the breathing process of humans and animals. Co2 is an important greenhouse gas. Global warming caused by the increasing amount of CO2 in the atmosphere due to the burning of fossil fuels is identified as a problem.

COD Chemical Oxygen Demand: Essential Oxygen total amount for oxidizing organic chemical and minerals in the water and waste water.

COP Conference of the Parties (to the UNFCCC): Annual conference among signatory counties of UNFCCC.

CSR Corporate Social Responsibility

DPM Diesel Particles Matter: Suspended particles coming from the exhaust of diesel cars.

ECAC European Civil Aviation conference: A Forum for cooperation and coordination between European national authorities in matters related to civil aviation.

EPNdB Effective Perceived Noise Level (dB): A unit commonly used ion a aviation context to express the average perceived noise level.

ETOPS Extended-Range Twin-Engine Operations: Most twin engine aircraft are certified so that has to be able to fly normally within an hour of an airfield in the event of an emergency. The ETOPS program allows operators to deviate from this rule under certain conditions. By incorporating specific hardware improvements and establishing specific maintenance and operational procedures, operators can fly extended distances more than 120 min from the alternative airport. ANA has implemented this operation in 1989. In 2002, ANA took advantage of the certification for a B777-200ER/ETOS of 207 min in USA.

EU European Union: Political and economic union based on European community. As of May 1, 2004, there are 25 signatory countries.

FANS Future Air Navigation System. Refer to CNS/ATM

FCCC (United Nation) Framework Convention on Climate Change: The 1992 United Nations Framework Convention on Climate Change is one of a series of recent agreements through which countries around the world are banding together to meet this challenge.

FIP Federal Implementation Plan

FMS Flight Management System: The Flight Management System (FMCM), in conjunction with other interfacing equipment in the aircraft, forms an integrated, full-flight regime control and information system which provides automatic navigation, guidance, map display, and in-flight performance optimization.

g/KN Gram/Kilo Newtons: Total amount of emission per unit of engine thrust on LTO cycle.

GSE Ground Support Equipment: Generic term of ground support equipment such as vehicles used for on/off-boarding of passengers and cargo.

GPS Global Positioning System: The global Positioning System (GPS) is a worldwide radio-navigation system formed from a constellation of 24 satellites and their ground stations. GPS uses these satellites as reference points to calculate positions accurate to a matter of meters, with advanced forms of GPS to better than a centimeter.

GPU Ground Power Unit: Power supply for aircraft's electrical and air conditioning system deployed on the ground maintenance. There are both portable and fixed GPU.

GWP Global Warming Potential: The GWP is the ratio of the warming caused by a substance to the warming caused by a similar mass of carbon dioxide. Thus, the GWP of CO2 is defined to be 1.0.

HC Hydrochlorocarbons Chemical compound of carbon and hydrogen. Unburned Hydrocarbons: Mixture of hydrocarbons that results from incomplete combustion processes.

HCFC Hydrochlorofluorocarbon; A compound consisting of hydrogen, chlorine, fluorine, and carbon.
The HCFCs are one class of chemicals being used to replace the CFCs. They contain chlorine and thus deplete stratospheric ozone, but to a much lesser extent than CFCs. This class of chemicals has higher global warming potential. They are used as fridge/ air conditioner's refrigerant, foaming agent for insulating foam and aerosol propellant.

HFC Hydrofluorocarbon: A compound consisting of hydrogen, fluorine, and carbon.
The HCFCs are one class of chemicals replacing CFCs. All HFCs have an ozone depletion potential of 0. Some HFCs have high GWPs. They are used as fridge / air conditioner's refrigerant, foaming agent for insulating foam and aerosol propellant.

IATA International Air transport Association: The general organization of international commercial aviation established in 1945 with 275 members airlines in 143 countries (as of May, 2005).

ICAO International Civil Aviation Organization: A specialized agency of the United Nations for international civil aviation.

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

ISO International Organization for Standardization

LTO Landing/Take Off Cycle: To control pollutions from aircraft in the vicinity of airports, ICAO established emissions measurement procedures and compliance standards for soot, unburned hydrocarbons, carbon monoxide, and oxides of nitrogen. A landing and take-off cycle was defined to characterize the operational conditions of an aircraft engine within the environs of an airport. It consists of 4 thrust settings for subsonic aircraft and the time in mode value.

MSDS Material Safety Data Sheet: MSDS id a measure for providing information about properties and handling procedures of specified chemical substances by business associates.

NASA National Aeronautics and Space Administration

NO_2 Nitrogen Dioxides: It forms in the combustion process and is an important air pollution material.

NOTAM Notice to Airman: Issued by each of the aviation agencies. NOTAM is a way of providing information about airline facilities, flight operation, emergency matters.

NO_X Oxides of Nitrogen Chemical compound consisting of one nitrogen and several oxygen atoms. Nox is generated in combustion process under high pressures and temperatures. These parameters have been increased in modern engines to reduce fuel consumption, and emissions of CO and HC. In the future, emissions of Nox are expected to decrease by 85% because of a new exhaust pipe design.

N_2O Nitrous Oxides: One of the greenhouse gasses. No emission from aviation.

O_3 Ozone. Molecule consisting of three oxygen atoms. Close to the ground it is a component of smog. In the stratosphere ozone absorb ultraviolet light. Nitric oxide emissions from air traffic at cruising altitudes cause an increase in atmospheric ozone.

ODA Official Development Assistance

ODP Ozone Depletion Potential: The ODP is the ratio of the impact on ozone of a chemical compared to the impact

of a similar mass of CFC-11. Thus, the ODP of CFC-11 is defined to be 1.0.

PCB Polychlorinated biphenyl: PCBs are mixture of synthetic organic chemicals. Due to their non-flammability, chemical stability, high boiling point and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications. Concern over the toxicity and persistence in the environment an health effects prohibited the manufacture, processing, and distribution in commerce of PCBs.

PPM Parts per million: A unit used to describe the contamination level of water and air. ISO recommends using micro-gram/gram for quantity and micro litter/gram-litter for volume instead of using ppm.

RDF Refuse, Derived and Fuel wastes material: Generic term for recycled fuel material. Fuel coming from recyclable materials such as refuse and burnable domestic garbage.

RPF Refuse, Paper and Plastic Fuel: RPF is a new type of recyclable plastic fuel derived from discarded paper and plastics. RPF is considered to be of a higher quality than other RDF types.

RPK Revenue Passenger Kilometers: The number of revenue passenger multiplied by the distance flown in kilometers.

PRTR Pollutant Release and Transfer Register: PRTR is a law for managing an reporting emissions of specified chemical substance into the environment.

RNAV RNAV is a method of navigation which permits aircraft operation on any desired flight path within the coverage of station referenced navigation aids or the limits of the capability of self-contained aids, or any combination thereof.

RVSM Reduced Vertical Separation Minimum: The goal of RVSM is to reduce the vertical separation above flight level (FL) 29,000ft from the current 2,000 ft minimum to 1,000 minimum. This will allow aircraft safely fly more optimum profiles, gain fuel savings and increase airspace capacity.

SO_2 Sulphur Dioxides Formed in combustion of fossil fuels: A colorless gas produced through the burning of fossil fuel containing sulfur. SO2 had an acid odor that is toxic when inhaled in large quantities, and also may cause acid rain. SO2 has occurs in the aerosol form, and therefore helps to prevent global warming by diffusing sunlight. Jet fuel contains a minute protection of sulfur, accordingly cause only minor emissions of this substance.

SO_x Oxides of sulfur

SPM Suspended Particle Matter: Particles of size less than 1/100 mm in diameter that has an ability to remain suspended in the air for hours. These are causes of many breathing problems.

SST Super Sonic Transport

VOC Volatile Organic Compound: Emitted during incomplete combustion of fossil fuels. In aviation emitted when the engine is run at low speed and the temperature in the combustion chamber is low. Also includes all types of solvents that evaporate from detergents and paints. These can initiate various chemical reactions when diffused in the air.

WECPNL Weighted Equivalent Continuous Perceived Noise Level: it is generally referred to as a ″high level of aircraft noise″ and is units showing the level of aircraft noise per day at one point. The conclusions are made considering noise level per aircraft, hours of flying and number of flights.

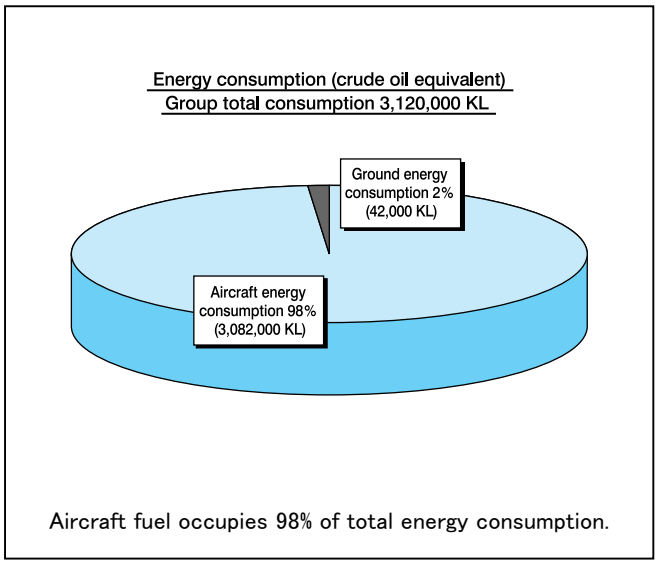
ANA Group Environmental Databank

In continuation from the last year, we here summarize ANA Group environmental data. This year we added comments about change so that comparisons with last year can be easily done. Please refer below for the impact that ANA Group has had on the environment and society.

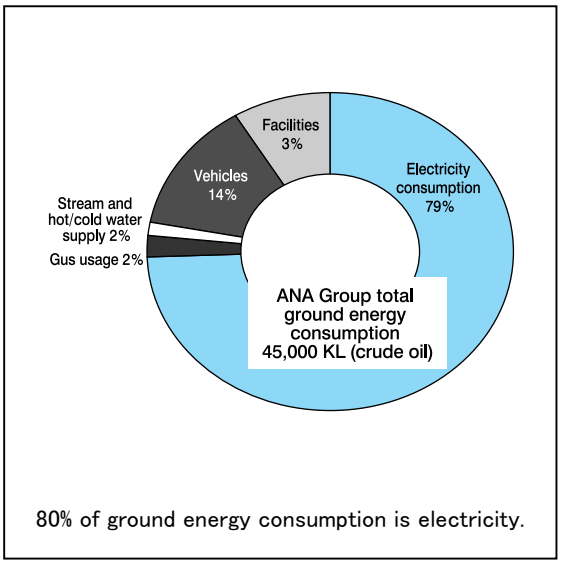
Aspects of ANA Group

1. Energy consumption

As the main business of ANA Group is air transportation, approx. 98% of its energy consumption is in the form of aircraft fuel. On the other hand, although the amount used on the ground is 2% and may sound trivial, it is actually 40,000KL (in crude oil equivalent). Electricity consumption accounts for 80% (approx. 130 million KWH), and this compares to about half of the annual electricity consumption of a major private railway in the Tokyo metropolitan area.



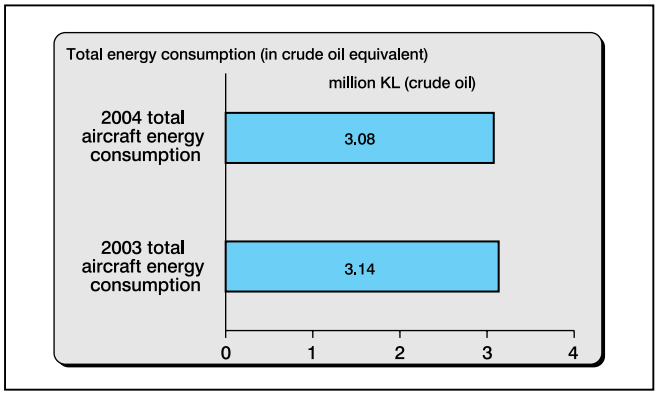
Aircraft fuel occupies 98% of total energy consumption.

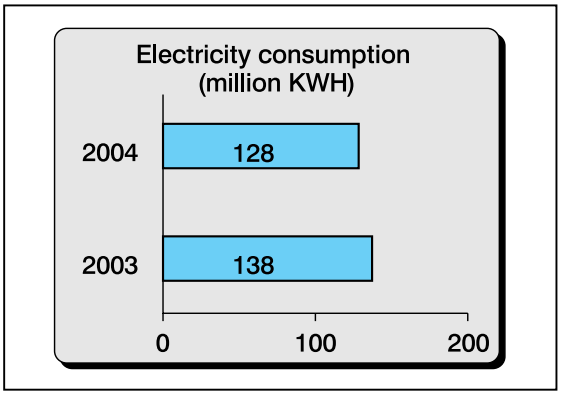


80% of ground energy consumption is electricity.

<Change> (1) Aircraft fuel, which accounts for the major part of our energy consumption decreased by 2.1% (70,000 in crude oil) from last year. Main reasons: improvements in flight methods, reduction in long-distance international flights, utilization of medium or small-sized aircraft.

(2) The electricity which occupies the most part of our major energy consumption decreased by 7% (approx. 10,000,000 KWH).





The reasons are;

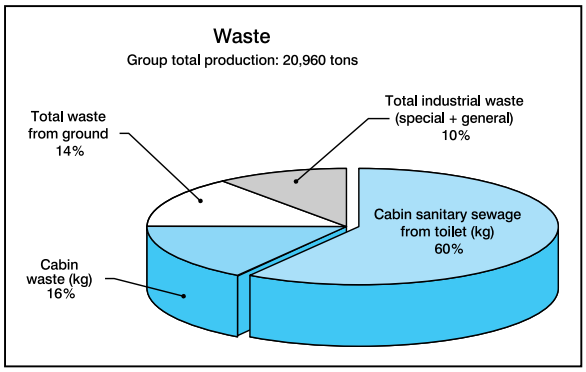
①Efforts by each office and work establishment, 70% of the total 40 locations recorded lower consumption than last year.

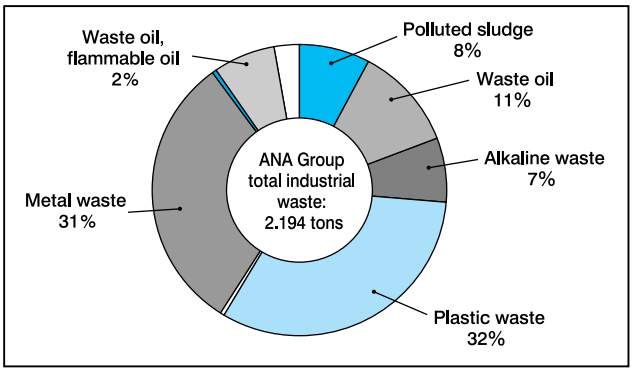
②Efficient use of air-conditioning system in the Business Center Building. Also the external transfer of ACC led to an 11% reduction (5,370,000 KWH) from last year, which compares to the annual electricity consumption of Narita Maintenance Center.

③The change in our computer system circuit lines started showing effects.

2. Waste exhaust

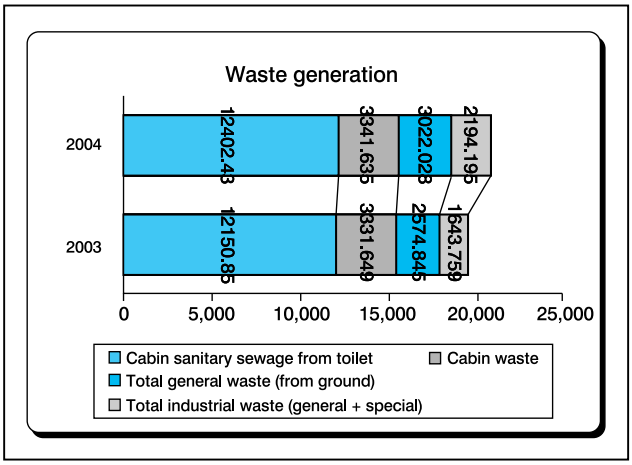
Total waste exhaust by ANA Group is 21,000 tons, and three quarters of this is from aircraft cabins (sanitary sewage from toilets and garbage). The rest of the waste is produced on the ground, the biggest part of which– 32% –– is plastic waste. Therefore, reducing cabin waste and plastic waste are important assignments when attempting to reduce total waste production.





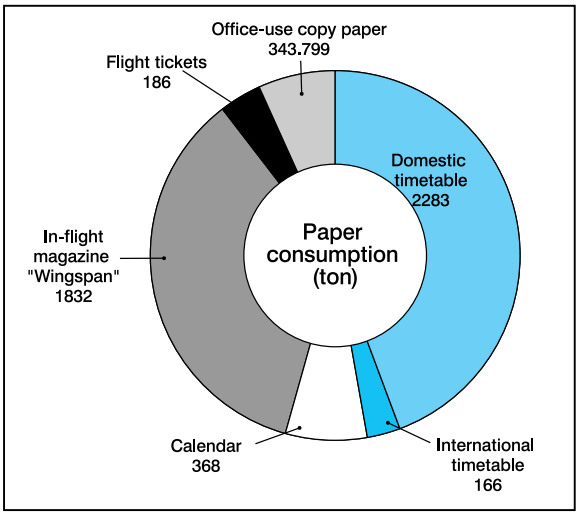
<Change>

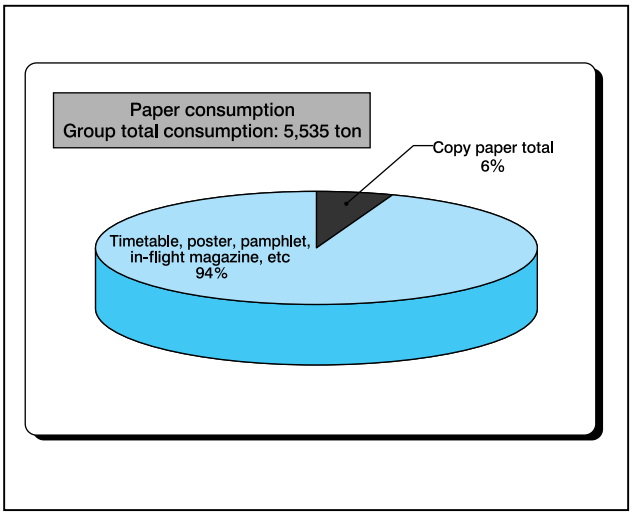
Our waste generation increased by 6% (1,260 tons) since last year. The main reason was that together with the opening of Haneda Terminal 2, industrial waste (especially plastic and metal) increased due to the disposal of office appliances and uniforms (summer style) and the close of the company dormitory.



3. Paper consumption

Total group consumption is 5,500 tons, and 94% of this derives from sales activities such as timetables, pamphlets, posters and in-flight magazines. On the other hand, copy paper occupies 6% of the total, yet makes up 350 tons in weight. Approx. 78% of this is recycled paper.

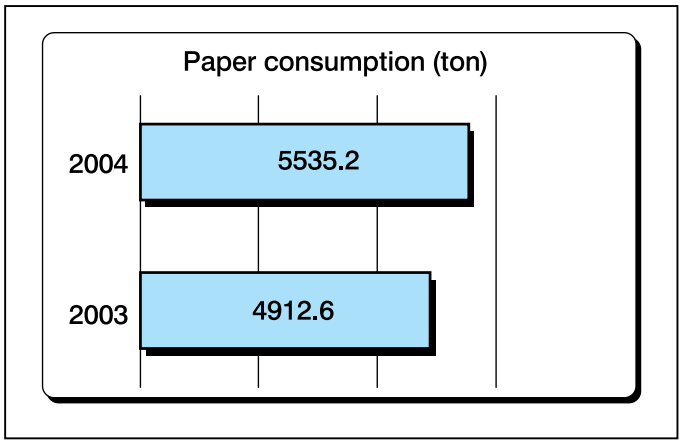




＜**Change**＞Paper consumption increased by 13% (500 tons) since last year.

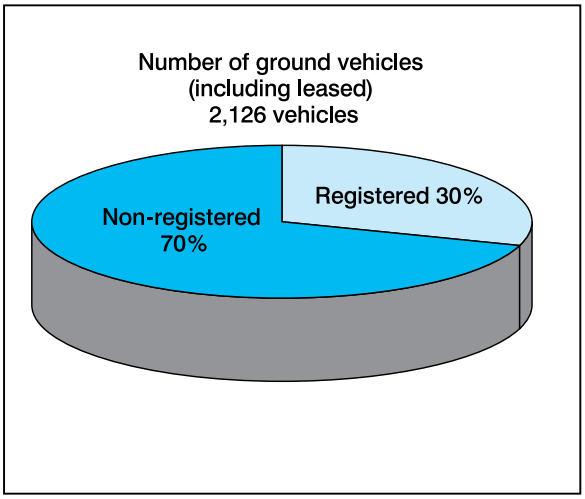
The reasons for this increase are; we added flight tickets (approx. 200 tons) which was not an element included last year, and also we produced approx. 45 tons of posters and pamphlets for the opening of Chubu International Airport Centrair.

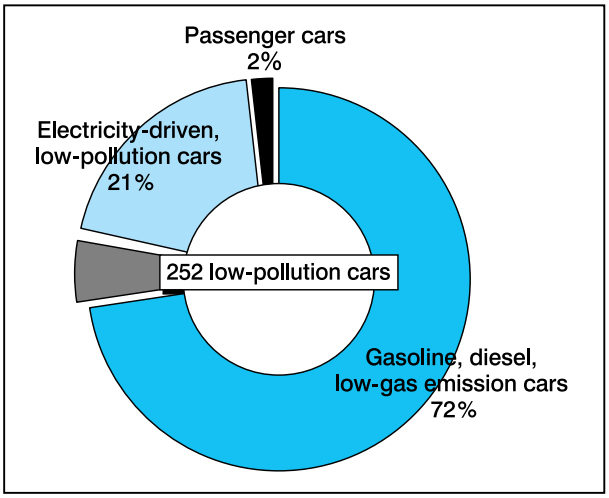
4,336 tons of pamphlets for ASX were not included.



4. Number of ground vehicles

ANA Group operates approx. 2,100 vehicles (including leased ones), and this makes for a huge impact on the environment. The fact that approx. 70% of those vehicles are non-registered (mainly ground handling vehicles) and are limited for use only in airports, they are unique compared with those of other airlines.



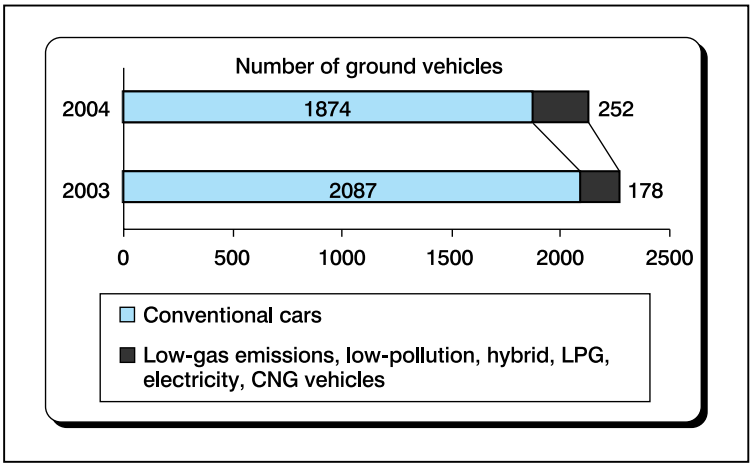


＜**Charge**＞

The vehicle number decreased by 7% (140 vehicles) from last year.

The main reason for this is the vehicle sharing that started at Chubu International Airport Centrair, and led to a reduction of 100 vehicles.

The ratio of less-pollution cars increased from 8% to 12%.



ANA Group Environmental Databank (fiscal year 2004)

					ANA Group total	ANA	Unit	Ratio against the previous year
Ozone depletion		Halon and Fluorocarbons aircraft	Specified CFC		0	0	kg	
			Halon present in fire extinguishers		17,049	16,063	kg	
			Total emission		0	0	kg	
Water sources	Depletion of water sources	Building use	Total water consumption		531,628	371,167	ton	
				Clean water	474,053	327,895	ton	93%
				Recycled water	57,575	43,272	ton	74%
				Ratio of recycled water use	11%	12%		
	Water pollution	Building use	Treatment amount of water waste		45,636	35,993	ton	99%
				Industrial use water	30,752	21,109	ton	72%
				Kitchen use water	14,884	14,884	ton	497%
		De-icing for aircraft	Total usage		1,392	1,392	KL	146%
Destruction of eco-system			PCB storage		4,364	4,247	kg	100%
Global warming	Deforestation	Paper consumption	Total paper consumption		5,535	5,374	ton	113%
				Total copy paper (purchased)	344	209	ton	153%
				Recycled copy paper	269	209	ton	
				Ratio of recycled copy paper	78%	100%		
				Other paper total(poster, pamphlet)	5,191	5,165	ton	111%
	Energy	Total of crude oil equivalent	Aircraft energy consumption		3,082,144	2,663,975	Crude oil KL	98%
			Ground energy consumption		45,474	36,516	Crude oil KL	93%
		Fuel consumption Aircraft	Total consumption		3,113,277	2,690,884	(kl)	98%
				Consumption per seat-kilometer	3.63	3.62	(L/100ASK)	99%
		Vehicle	Total of vehicle fuel consumption		6,026	2,178	(kl)	91%
				Light oil	5,592	1,887	(kl)	90%
				Diesel Gasoline	434	291	(kl)	105%
		Building	Total of facility fuel consumption		3,951	3,358	(kl)	94%
				Heavy oil	1,244	654	(kl)	101%
				Light oil	2,706	2,704	(kl)	91%
				Kerosene and others	1	0	(kl)	94%
			Total gas use		755,885	479,535	(m3)	83%
				City gas	727,455	479,535	(m3)	81%
				Propane gas	28,430	0	(m3)	214%
			Energy supply		29,227	21,393	(m3)	109%
		Power consumption Building	Electricity		128,137,874	112,918,455	(kWh)	93%
	Air pollution	Gas emission Aircraft	Number of aircraft		188	143	Aircrafts	104%
		Vehicle	Number of vehicle		2,126	590	Cars	94%
				Number of low-pollution cars	252	108	Cars	142%
			Ratio of low-pollution cars		12%	18%		
		CO2 emission	Total emission		773.4	667.8	10,000ton-CO_2	98%
		Aircraft		Total emission	767.1	663.0	10,000ton-CO_2	98%
				Emission per-seat kilometer	89.38	89.18	g-CO2/ASK	
		Total emission from ground equipment and vehicles		Total emission	6.3	4.8	万ton-CO_2	78%
		Carbon emission	Total emission		211	182	10,000ton-C	
		Aircraft		Total emission	209.2	180.8	10,000ton-C	
				Emission per-seat kilometer	24.38	24.32	g-C/ASK	
		Total emission from ground equipment and vehicles		Total emission	1.7	1.3	万ton-C	
		Nitrogen oxide (NOx) Aircraft	(Emission in LTO cycle)		0.65	0.51	万ton-Nox	
		Hydrocarbon (HC) Aircraft	(Emission in LTO cycle)		0.11	0.10	万ton-HC	
		Carbon monoxicide (CO) Aircraft	(Emission in LTO cycle)		0.61	0.49	万ton-CO	
		Fuel dumping from aircraft Aircraft	Total dumping amount		83	83	(kl)	
			Times		2	2	Times	
Waste		Total amount of waste			20,960,290	20,084,574	kg	106%
		From aircraft	Total cabin waste and sewage from toilet		15,744,067	15,679,962	kg	102%
		From ground	Total		5,216,223	4,404,612	kg	124%
				Total of general waste	3,022,028	2,807,830	kg	117%
				Total of industrial waste	2,194,195	20,084,574	kg	124%

The above data summarize the figures of ANA and other ANA Group companies (air transportation, aircraft maintenance, ground handling, GSE maintenance and building management) of fiscal year 2004. Please note some group companies are not included in this data.

In closing

Data to be gathered, analyzed, and fully disclosed...

- In fiscal year 2004, the total energy consumption of ANA Group was 3,130,000 KL (crude oil equivalent), with 98% of this being accounted for by aircraft operation. The remaining 2%, though a small part of the total, compares to about half of the annual consumption of a major private railway in Tokyo metropolitan area.
- The most effective way to reduce CO_2 emissions is to update aircraft. Bearing this in mind, ANA became the first airline to launch the B787 last year, and we will start introducing them (50 aircraft) to our fleet from 2008 when the 1st commitment period of the Kyoto Protocol starts. ANA has also been holding active discussions as a member of the advisory group of the CO_2 reduction task force of CAEP (Committee on Aviation Environmental Protection) of ICAO (International Civil Aviation Organization).
- The total paper consumption of ANA Group in fiscal year 2004 was 5,535 tons, 90% of which was for sales activity-related goods, such as timetables, in-flight magazines and posters. Although we increase the use of recycled paper and also recycle paper ourselves as a measure to prevent forest destruction, we never feel this is enough. Not only will we direct our efforts relating to consumption, but we will also make further efforts for forest regeneration (planting and nursing).
- ANA Group generated 2,194 tons of industrial waste and 3,022 tons of general waste in fiscal year 2004. Not only ensuring such waste is properly treated, we will also continue with our efforts to reduce the amount. We have been investigating our waste disposal processing using third party experts since last year and we shall disclose the results.

In this report, we gathered information from around 50 companies of ANA Group, and showed environment-related data as detailed a manner as possible. With environmental consciousness becoming more and more significant, we believe that the starting point of environmental efforts is to disclose the current situation in an honest manner. We'll continue to be sincere to society as ever.

To become more environmentally friendly...

As an airline, there is no way for us to avoid the environmental impact we have in the form factors such as CO_2 emissions from our aircraft. There are, however, measures that we can directly take to eliminate the impact of our operations, and a variety of measures we can set in action. From this viewpoint, we conduct the (1) forestation program in areas surrounding airports, (2) coral planting on Okinawa and (3) tree planting in desertified areas in Asia. Also, (4) we hold the international environmental picture book contest, and introduce the prize-winning works to the public, as well as (5) cooperating for the reforestation fund at our airport counters and offices. To become more environmental friendly, ANA will begin in any way we can.

＜From the editor＞

First of all I'd like to say thank you for consulting this report. We have endeavored to make the best of our restricted resources to produce this "hand-made" report and have spent considerable time on processes of layout and the positioning of text, yet we have given precedence, of course, to the reporting of "ANA and environment". I look forward to hearing your opinions on the matters we have discussed in this report as well as on the daily activities of ANA.

Chief Editor: Toru Sasaki

Environmental Report 2005

Dec. 2005

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