

Abridged and Illustrated for Easy Understanding

Annual Report on the Environment in Japan 2005

A Low Carbon Society — A New Era Shaped by “People” and “System”



Ministry of the Environment

To Our Readers

This booklet *Abridged and Illustrated for Easy Understanding—Annual Report on the Environment in Japan* is a summary of the *Quality of the Environment in Japan 2005* (White Paper), an annual report on the environment issued by the Government, published on June 17, 2005. The content of this booklet was edited to reach out to a wider readership with a more readable publication. This booklet offers an overview on the subject of “A Low Carbon Society—A New Era Shaped by ‘People’ and ‘System’” (in Part One) as well as a digest of environmental conservation policies and measures implemented by the Government in FY 2004 (in Part Two).

The *Quality of the Environment in Japan 2005* was printed by Gyosei Corporation. The Ministry of the Environment also published the *Annual Report on the Environment for Children* on November 17, 2005, which is edited for easy understanding by primary and middle school students. They are also available on the Ministry of the Environment websites:

Quality of the Environment in Japan (<http://www.env.go.jp/policy/hakusyo/>)

Annual Report on the Environment for Children (<http://www.env.go.jp/policy/hakusyo/kodomo.html>)

They are presented in Japanese only.

Back issues of *Quality of the Environment in Japan* and *Abridged and Illustrated for Easy Understanding—Annual Report on the Environment in Japan* are available on the Ministry of the Environment website (<http://www.env.go.jp/en/w-paper/index.html>).

Besides the topics covered in this booklet, the *Quality of the Environment in Japan 2005* also introduces the following websites for your reference:

- Toward the Realization of a Virtuous Circle for Environment and Economy in Japan (http://www.env.go.jp/policy/env_econo/index.html)
- Ecominister (My family’s Minister of the Environment) (<http://www.env.go.jp/policy/wagaya/index.html>) (in Japanese only)
- EcoFamily Website (<http://www.eco-family.jp/>) (in Japanese only)
- Global Environment Information Centre (<http://www.geic.or.jp/geic/>)

The drawing on the front cover is the work of Akane Iwao, a then third-year student at the Oita Prefectural Hijiyoukoku High School. The drawing won the Minister of the Environment Award (General Category) in the 2005 White Paper on the Environment Cover Page Illustration Contest sponsored by the Ministry of the Environment and the Japan Environment Association.

Ms. Iwao commented, “I drew with the hope that, by supporting the global environment, we can co-exist with many other living things on earth in the future.”

The drawing on the back cover is the work of Satsuki Suzuki, a then fourth-grade student at the Sendai City Municipal Yoshinari Primary School in Miyagi Prefecture. It received honorable mention in the same Cover Page Illustration Contest.

Ms. Suzuki commented, “A society kind to the environment is a society that protects the earth, and that means a society where all living things live together by being nice to and supporting each other. The earth is very small in the whole universe and human beings are even smaller. But if we work together, we can protect our precious planet—the Earth.”

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Part One

Overview: A Low Carbon Society—A New Era Shaped by “People” and “System”

Chapter 1

Earth's Future Built on the Kyoto Protocol

<Summary of Chapter 1>

The Kyoto Protocol entered into force in February 2005. Developed countries and countries with economies in transition that have committed to curbing greenhouse gas emissions are legally bound to meet their quantified emission limitation or reduction commitments. The Kyoto Protocol is only a first step taken by mankind on a long road to stabilizing the concentrations of atmospheric greenhouse gases. Steady efforts to meet the commitments of the Kyoto Protocol are essential in the building of a low carbon society.

Section 1 Kyoto Protocol Set in Motion

1. Kyoto Protocol's Entry into Force

The Kyoto Protocol was adopted unanimously at the 3rd Conference of the Parties (COP3) to the United Nations Framework Convention on Climate Change (hereinafter referred to as "Convention" in this Chapter) held in Kyoto in December 1997, with Japan as the host country. In February 2005, the Kyoto Protocol entered into force.

The Kyoto Protocol is a groundbreaking achievement in that it successfully committed, for the first time ever, developed countries and countries with economies in transition (Annex I Parties) to specific quantified targets to limit or reduce their greenhouse gas (GHG) emissions. The Protocol's commitments are based on the principle of "common but differentiated responsibilities and respective capabilities" and on the idea that "the developed country Parties should take the lead in combating climate change," as stipulated by the Convention.



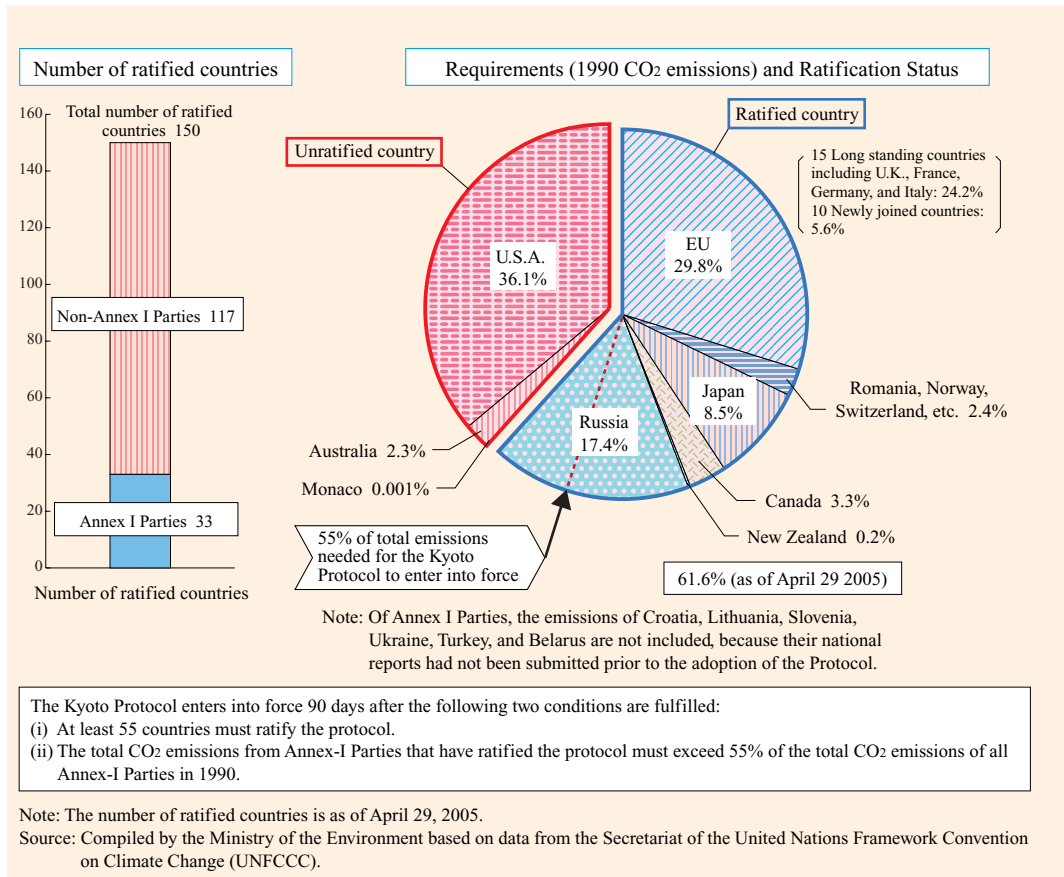
H.E. Ms. Wangari Maathai, Kenyan Deputy Environment Minister, presenting a keynote speech at the Commemorative Event to Mark the Entry into Force of the Kyoto Protocol

Outline of Kyoto Protocol

Targeted gases	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆
Sinks	Amount of CO ₂ absorbed by forests and other sinks is calculated.
Base year	1990 (For HFCs, PFCs, SF ₆ , base year can be 1995.)
Commitment period	5 years between 2008 and 2012
Targets	An aggregated reduction of at least 5% by developed countries: Japan -6%, United States -7%, and EU -8%
Kyoto Mechanisms	Systems to achieve emission targets in a cost-effective manner through international cooperation <ul style="list-style-type: none"> • Clean Development Mechanism (CDM) A developed country implements projects in a developing country and earns abatement credits for use against its own GHG emissions. • Joint Implementation (JI) Developed countries jointly implement projects and share earned abatement credits for use against their own GHG emissions. • Emissions Trading A developed country that has achieved emission reductions transfers (trades) the excess to other developed countries.
Obligation of the Parties	<p>Obligations for All Parties</p> <ul style="list-style-type: none"> ○ Create, report, and update inventory of GHG emissions and removals ○ Formulate, implement and publish national programmes, including mitigation and adaptation measures, etc. <p>Obligations for Annex I Parties</p> <ul style="list-style-type: none"> ○ Achieve quantified limitation or reduction targets ○ Develop national systems for estimating GHG emissions and removals by 2007 ○ Make voluntary financial contributions to the Adaptation Fund to support efforts in developing countries

Source: Ministry of the Environment

Requirements for the Kyoto Protocol to Enter into Force and Ratification Status



2. Significance of the Entry into Force of the Kyoto Protocol

With the entry into force of the Kyoto Protocol, the Annex-I Parties became legally bound to meet the quantified emission requirements. The commitment of the Kyoto Protocol is a “commitment to the international community,” also a “commitment to the Earth” to protect the earth’s ecosystem as a whole, and a “commitment to the future” with future generations.

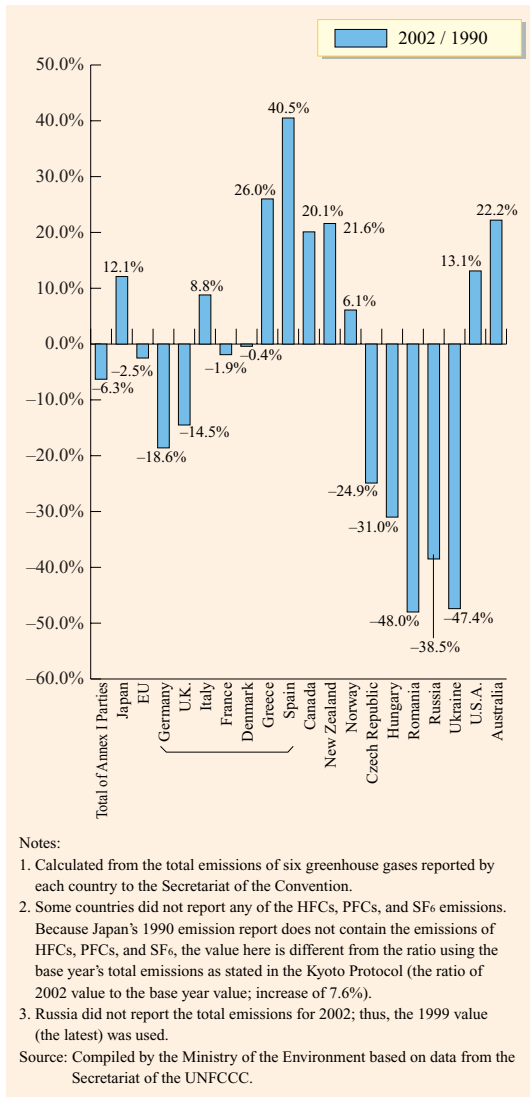
When the latest emissions of greenhouse gases by developed countries are compared to those recorded in 1990, the emissions of Japan and Canada, as well as countries that have not ratified the Kyoto Protocol such as the United States and Australia, have increased. Emissions of the overall EU have slightly decreased, and countries with economies in transition, such as Russia, have seen a drastic decline.

Quantified GHG Emission Limitation or Reduction Commitments of Annex-I Parties

EU (15 countries), Bulgaria, Czech Republic, Estonia, Latvia, Liechtenstein, Lithuania, Monaco, Romania, Slovak Republic, Slovenia, Switzerland	- 8%
U.S.A.	- 7%
Canada, Hungary, Japan, Poland	- 6%
Croatia	- 5%
New Zealand, Russia, Ukraine	0%
Norway	+ 1%
Australia	+ 8%
Iceland	+ 10%

Source: Compiled by the Ministry of the Environment based on data from the Secretariat of the UNFCCC.

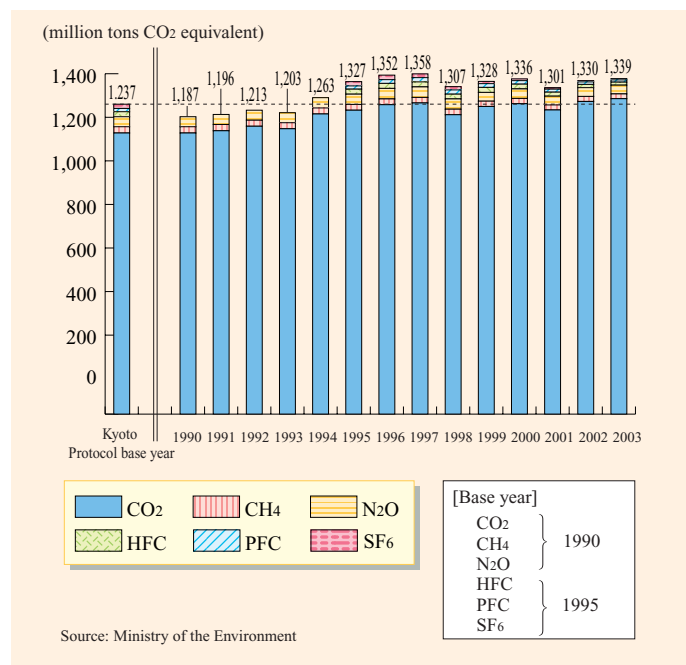
Changes in the GHG Emissions by Major Developed Countries



In FY 2003, Japan's total GHG emissions reached 1,339 million tons*, 8.3% increase from 1,237 million tons* of 1990, which is the base year of the Kyoto Protocol. The base year for HFCs, PFCs and SF₆ is 1995. Since the quantified commitment of Japan for the first commitment period is a 6% reduction, the gap has widened to 14.3%.

* CO₂ equivalent

Japan's Greenhouse Gas Emissions



Section 2 Impacts of Global Warming

The Intergovernmental Panel on Climate Change (IPCC) *Third Assessment Report* published in 2001 reports that the global mean surface temperature has increased by approximately 0.6 °C, and the global mean sea level has risen approximately 10–20cm over the 20th century. Various climate changes have been observed, as exemplified by the higher frequency of heavy rainfall at mid-to-high latitudes in the northern hemisphere.

Although there might be positive effects in some areas or fields as long as temperature increases caused by global warming remain slight; the risk would increase as temperatures rise, the report also warns.

In Japan, mean surface temperature has risen by about 1 °C during the 20th century. In recent years, changes in

Changes Observed in Recent Years

Index	Changes Observed
Global mean surface temperature	Increased by approximately 0.6 °C over the 20th century
Global mean sea level	Increased by 10–20cm over the 20th century
Hot days/Heat index	Increased (likely)
Cold/frost days	Decreased for nearly all land areas during the 20th century
Heavy precipitation events	Increased at mid- and high latitudes in the northern hemisphere
Drought	Increased frequency in some areas
Glacier	Receded in wide areas
Snow cover	Decreased in area by 10 % since the 1960s (very likely)

Source: Compiled by the Ministry of the Environment based on the IPCC *Third Assessment Report*.

ecological distribution have been observed: habitat ranges of some alpine flora have decreased; habitat ranges of insects and animals have changed; the flowering dates of cherry blossoms and foliage season of maple leaves have shifted. Also increased frequency of heavy downpours is observed. Global warming has been pointed out as one of the causes of such meteorological and ecological changes. However, relationship between the observed phenomena and anthropogenic climate change has not been fully established on a firm scientific basis. Progress in further research is expected to shed more light on the issue.

Projected Impacts of Global Warming

Index	Projected Effects
Global mean surface temperature	Increase of 1.4 –5.8 from 1990 to 2100
Global mean sea level	Rise of 9–88cm from 1990 to 2100
Impacts on meteorological phenomenon	Increase in floods and droughts
Impacts on human health	Heat stroke patients increase; infectious diseases, such as Malaria, become widespread
Impacts on ecosystem	Extinction of some fauna and flora, shift in ecosystem ranges
Impacts on agriculture	Grain production decreases in many areas. Some areas may experience increases in the near future.
Impacts on water resources	Further decrease in water resources and degradation of water quality, in many areas experiencing water shortage
Impacts on the market	Developing countries dependent upon the production of primary products will suffer immense economic loss.

Source: Compiled by the Ministry of the Environment based on the IPCC *Third Assessment Report*.

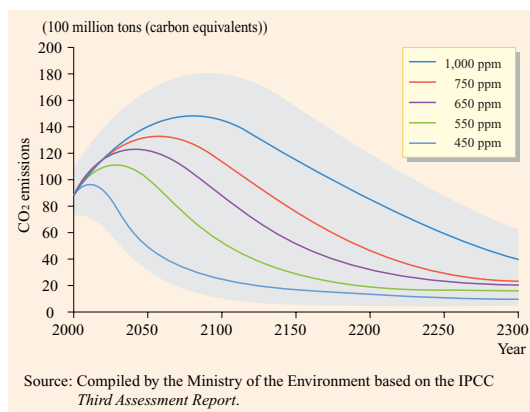
Section 3 Ultimate Goal of the Kyoto Protocol

1. In Pursuit of the Ultimate Objective of the Convention

The ultimate objective of the Convention is the “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.” Stabilization of GHG concentrations in the atmosphere means maintaining the gas concentrations at certain levels by balancing the amounts of gases emitted into the atmosphere with the amounts absorbed by the oceans and terrestrial ecosystems. Any eventual stabilization level is governed by the accumulated greenhouse gas emissions until the time of stabilization. From now on, it is necessary to scientifically assess the level of global warming that is likely to take place, at what probability, and what the impacts will be, and to determine in terms of policy measures how much emissions should be reduced and by when it should be achieved.

No international consensus has been reached on the eventual stabilization levels of GHG concentrations. According to the projection of the IPCC *Third Assessment Report*, the CO₂ emission must be drastically reduced (50–80%) in order to stabilize the atmospheric GHG concentrations.

Changes in CO₂ Emissions in Different Stabilization Scenarios



2. Beyond the Kyoto Protocol

In order to stabilize the atmospheric GHG concentrations, it is necessary to curb their emissions on a long-term, continuous basis even after the first commitment period of the Kyoto Protocol is over. To that end, measures should be taken not only from the perspective of meeting short-term goals, such as the numerical targets stipulated by the Kyoto Protocol, but also from a mid-to-long term perspective.

To achieve the ultimate objective, we must accumulate scientific knowledge and intensively carry out studies to answer the questions, such as at what levels should the concentrations be stabilized, by when should the world’s overall emissions of greenhouse gases start to decrease, and how much should the total emissions be at that time. In view of the characteristics of global warming issues, we need to seek to change our awareness, reform the social systems, and

develop, disseminate and invest in technology. We also need to envision, from a mid-to-long term perspective, what kind of society we want to build and take actions toward that vision. As early as 1996, the EU agreed, focusing on the long term, on the goal of maintaining the global temperature so that it would not increase by more than 2 °C from the pre-Industrial Revolution level. This agreement was reconfirmed by the European Council in March 2005. Each individual EU country has also begun to set up their own specific long-term goals.

Measures Taken by Selected EU Countries

Country and Date of Measure	Announced by or in:	Mid-term Targets	Long-term Targets
Germany (October 2003)	German Advisory Council on Global Change (WBGU)	• Reduce 45 – 60 % (from the 1990 level) of the world's CO ₂ emissions by 2050.	• Limit the maximum increase of surface temperature to 2 °C from the pre-Industrial Revolution level and less than 0.2 °C in 10 years. • Control the CO ₂ concentration at no more than 450 ppm.
United Kingdom (February 2003)	Energy White Paper	• Reduce 60% of CO ₂ emissions from current level by 2050.	• Control the CO ₂ concentration in the atmosphere at no more than 550 ppm.
France (March 2004)	Interministerial Task-Force on Climate Change	• Limit the per capita annual CO ₂ emissions to 0.5 ton (carbon eq.) by 2050. • Reduce the world's overall annual emissions to 3 billion tons (carbon eq.) by 2050.	• Stabilize the CO ₂ concentration in the atmosphere at no more than 450 ppm.
Sweden (November 2002)	Swedish Environmental Protection Agency	• Limit per capita GHG emissions in developed countries to 4.5 tons (carbon eq., currently 8.3 tons) by 2050, and then further reduce the emission gradually.	• Stabilize the concentrations of GHGs (6 gases stipulated by the Kyoto Protocol) in the atmosphere at 550 ppm. (About 500 ppm in the CO ₂ concentration.)

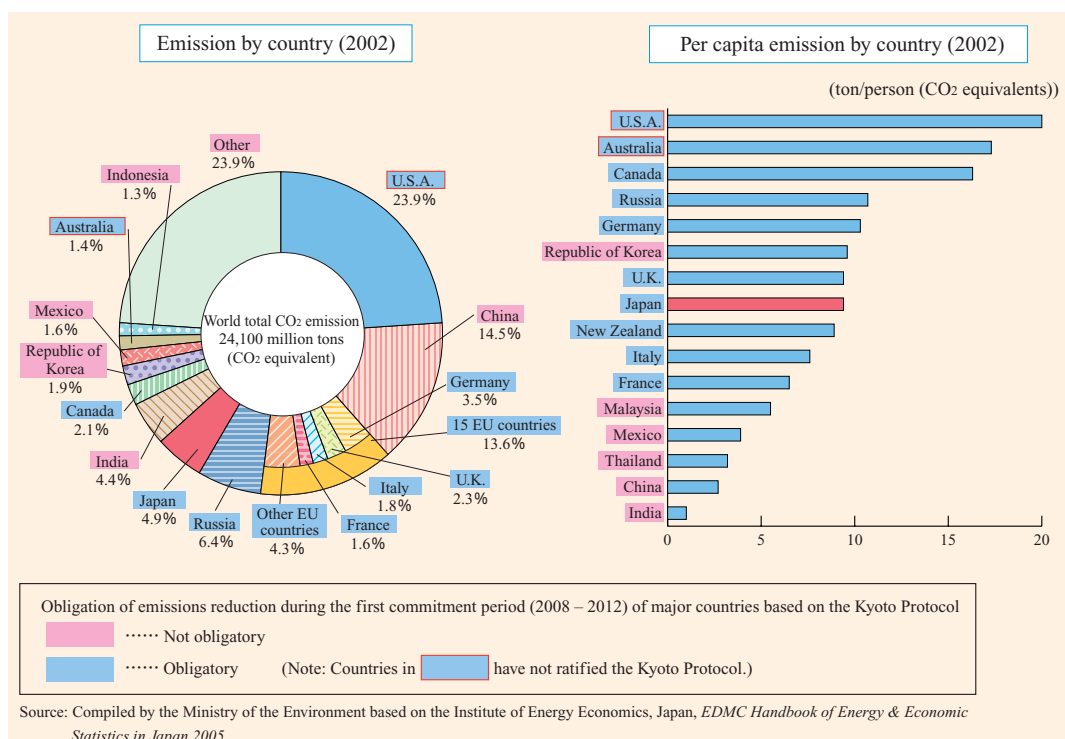
Source: Compiled by the Ministry of the Environment

3. The Next Framework

In order to build an equitable and effective framework when the first commitment period ends in 2012, it is important to set up common rules to which all countries, including the U.S. and developing countries, would adhere.

The United States, which currently does not support the Kyoto Protocol, is the largest emitter of greenhouse gases in the world. For the next framework to be an effective international undertaking in mitigating global warming, the

Total CO₂ Emissions and Per Capita CO₂ Emissions by Country



participation of the United States is indispensable.

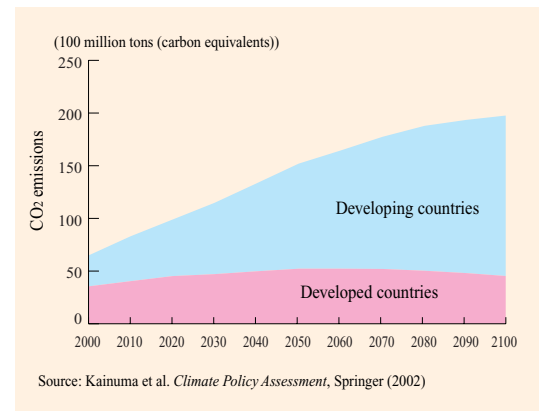
Per capita emissions in developing countries are still low compared to that in developed countries, and the majority of the world's greenhouse gas emissions in the past and present were emitted by developed countries. In addition, the state and capacity of each country in combating global warming is different. Under these circumstances, developed countries must cooperate in and support global warming countermeasures undertaken by developing countries. As the emissions of greenhouse gases by developing countries are expected to exceed those of the developed countries as soon as in 2010, the next framework must also incorporate effective measures to control the actual emissions of the developing countries.

4. Japan's Challenge of Building a Low Carbon Society

To achieve the ultimate objective of stabilizing the concentrations of greenhouse gases in the atmosphere stipulated by the convention, the world must work at reducing the emissions on a long-term and continuous basis. Under this circumstance, Japan must take the lead in building a society that emits little greenhouse gases, or a low carbon society.

What specifically is the low carbon society we are going to build? The destination of our long journey is a question now posed on us.

Projected CO₂ Emissions of Developed and Developing Countries



Chapter 2

Society-wide Efforts towards the Creation of an Environmentally Advanced Nation

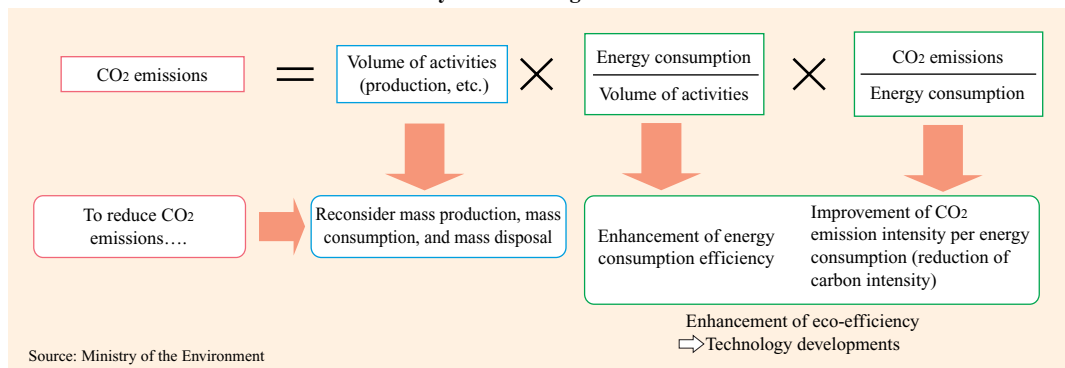
<Summary of Chapter 2>

To realize a low carbon society, it is necessary to work towards the creation of an “environmentally advanced nation” (creation of a sustainable society), in which all actors in all aspects of life care for the environment. This chapter focuses on the cultivation of “people” who carry out voluntary environmental conservation activities and the development of “systems” which help organizations and the entire society to facilitate environmental conservation, and takes a look at various initiatives being launched throughout the country.

Section 1 An Environmentally Advanced Nation Shapes a New Era

To ensure continued reduction of CO₂ emissions resulting from energy use, the main cause of global warming, it is necessary to promote measures that efficiently and effectively combine the following three elements: “energy consumption efficiency,” “CO₂ emission intensity per energy consumption (carbon intensity),” and “volume of activities.” To improve “energy consumption efficiency” and reduce “carbon intensity,” technology developments are indispensable. At the same time, from the standpoint of “volume of activities,” it is essential that we reconsider our lifestyles and socio-economic activities that are dependent on mass production, mass consumption, and mass disposal, and practice more environmentally conscious daily life and business activities.

Three Ways of Reducing CO₂ Emissions



The path we have chosen to pursue toward a low carbon society lies in our efforts to realize a society that is healthy in both economy and environment. In the efforts we seek to reduce GHG emissions while actualizing sound development of an economy with a low environmental load and a high quality of life. It is necessary to develop and diffuse energy-saving equipment, enhance energy use efficiency, and accelerate technology development; and it is equally important to enhance environmental awareness, which leads to each individual’s voluntary environmental conservation activities.

By taking part in such efforts, it would be possible for us to develop and share greater interest in environmental issues and work together in environmental conservation initiatives. This will eventually lead us to a sustainable society.

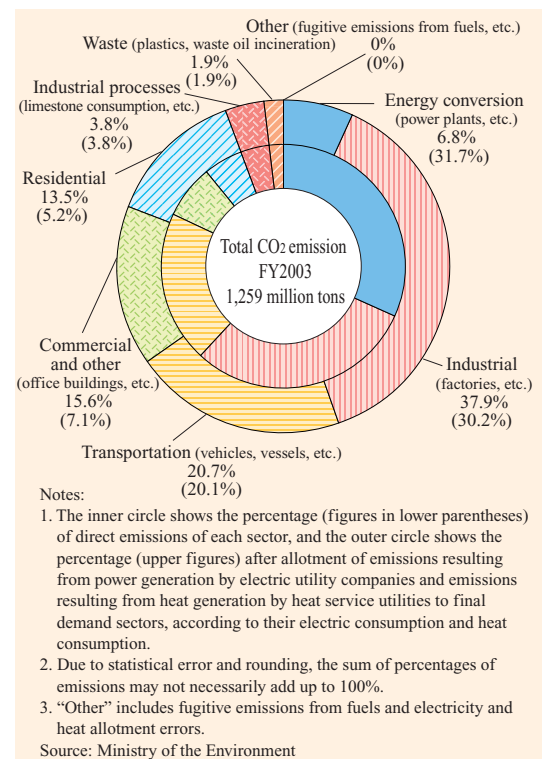
Building a sustainable society requires nurturing people who voluntarily act for environmental conservation in all scenes of life. And it is equally important to create “systems” for transforming our socio-economic systems to an environment-friendly one. Such initiatives have already begun by some actors aiming at the realization of a sustainable society.

Section 2 Initiatives at Home

As many of today's environmental problems are attributable to our daily living and business activities, it is of great importance that efforts be made to reduce environmental load at home where we carry out our daily activities. Residential energy consumption is increasing yearly along with the growing number of households and diffusion of home electrical appliances. CO₂ emissions from energy consumption by the residential sector account for approximately 14% of all Japanese CO₂ emissions from energy consumption. The amount has increased by approximately 30% from the base year (FY1990) of the Kyoto Protocol, marking a substantial growth rate compared with other sectors.

To cultivate "people" who can help build a sustainable society, the home plays an integral role. Home is the place where small efforts can gradually produce big effects. It is where a slight shift in one's point of view can reduce environmental load while achieving "high quality of life" or "enjoyable life." Furthermore, as home discipline such as "turning off lights," "not brushing teeth with water running," and "using things with care" help to instill the idea of *mottainai*, it can be said that the home is the starting point of nurturing "people" needed for the sustainable future.

CO₂ Emissions by Sector



Examples of Simple Efforts at Home

Shopping and Wastes

- Bring your own shopping bag
- Select eco products
- Make use of lease and rental services
- Make use of recycle shops
- Decline any unnecessary wrapping
- Sort wastes



Water

- Turn off the water when brushing teeth
- Reduce shower time by a minute a day
- Use leftover bath water for other purposes
- Do full loads of laundry
- Use appropriate measures of detergents
- Use a bucket rather than running water when washing a car



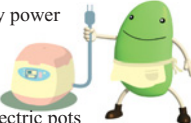
Transportation and Vehicles

- Walk or use bicycles for short distances
- Use trains for travel
- Avoid jackrabbit starts and quick acceleration
- Eliminate unnecessary loads on cars
- Avoid unnecessary idling
- Avoid revving
- Make use of car sharing



Energy

- Turn off main power when not in use
- Unplug appliances to reduce standby power
- Set air conditioners to 28 °C
- Plan programs before watching TV
- Don't use "keep warm" feature of electric rice cookers/warmers and electric pots
- Use compact fluorescent light bulbs
- Select energy-saving home electrical appliances




Food, Clothing and Housing

- First, adjust temperature by changing clothing
- No neckties and jackets in the summer
- Eat vegetables and food in season
- Reduce kitchen waste
- Learn eco cooking
- Use sunshades in the summer



Others

- Use things with care
- Plant trees in the garden
- Make a biotope in the garden
- Enjoy nature on holidays
- Study about environmental problems
- Teach children about the environment



Source: Ministry of the Environment

Through consistent efforts to reduce environmental load in each home and by making it a habit, it becomes possible to practice what is learned at school and work in daily life, and to apply the wisdom of life gained at home in activities at school and work. It is hoped that such changes in conduct at home will spread to other actors in society through each family member.

Section 3 Initiatives at Schools

To build a sustainable society, it is extremely important to carry out the environmental education of children who bear the destiny of our future. Schools play a significant role in fostering environment-minded people, who can take a lead in making a better society with responsible behavior and a correct understanding of the relationship between humankind and the environment.

Simply having knowledge about the current situation and causes of environmental problems is not sufficient. You must also be able to translate knowledge into concrete actions. This ability is believed to be cultivated by repeating the process of experiencing, feeling, and understanding through experiential learning. Environmental education should therefore be based on experiential and practical activities in nature and everyday life.

Fukae Primary School in Nijo-cho, Fukuoka Prefecture, conducts classes aimed at raising “awareness of the way of life” through “awareness of rich local nature,” thereby fostering an attitude of cherishing the environment. In FY 2004, fifth graders learned to “think about the waterside environment for people and living things in Fukae.” The children went to the local sea and river and learned that many living things inhabit these areas and how domestic wastewater is polluting these environments. This experience brought forth the desire to “clean the sandy beach which functions as a filter of water pouring into the sea,” and the students held exchange activities with the local people, proposing solutions. They also became eager to take the initiative to do whatever they could. They prepared posters and leaflets to promote the conservation of river water quality and installation of household wastewater treatment facilities, and cleaned up the beach. In all stages of learning, from field survey, exchange activities, to actual improvement of the environment, what they learned from “experience” was driving concrete actions.



Survey of living things in the river
Photo: courtesy of Fukae Elementary School, Nijo-cho, Fukuoka Prefecture

Section 4 Corporate Initiatives

Today, amid increasing environmental load caused by regular business activities, companies are major force driving economic activities. Thus, it is vital that companies incorporate environmental considerations in all aspects of their business activities. Moreover, as companies can possibly contribute to solving environmental problems through development of new technology for environmental conservation, it is also hoped that companies take initiatives to make full use of their abilities.

Corporate efforts in environmental conservation are not confined to just observing the laws and regulations. There are many examples of companies adopting environmental conservation measures as their social responsibility or focusing on environmental conservation as one of their most important business strategies. Such voluntary efforts are producing various positive results.

For example, according to a survey by the Ministry of the Environment, approximately 57.1% of all companies have voluntarily initiated efforts to reduce their CO₂ emissions. Efforts in the fields of environmental business and the development of environment-friendly products have remarkably improved the resource and energy saving performance

of home electrical appliances in the last few years. Japan's technology realizing both fuel efficiency and acceleration performance as represented by hybrid vehicles is highly regarded in the world. The use of vehicles equipped with such environment-friendly technology is spreading.

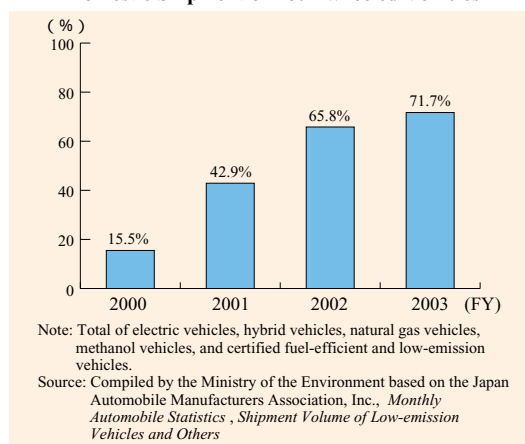
According to a FY2004 estimate by the Ministry of the Environment, consumer behavior guided by consideration for environmental conservation is expected to induce greater demands and markets for environmentally conscious products and business operations (environment-induced business). Their size is predicted to grow to approximately 103 trillion yen by 2025, employing approximately 2.22 million persons. As these markets expand with the support of consumers, companies will be attracted to make greater investment in environment-related businesses, further developing the businesses and thus contributing to the conservation of the environment.

Estimates of the Current and Future Market Sizes and Employment Potential of Environment-induced Businesses

Year	Market size (trillion yen)		Workforce (10,000 persons)	
	2000	2025	2000	2025
Environment-induced businesses	41	103	106	222

Source: Ministry of the Environment

Ratio of Low-emission Vehicles in the Total Domestic Shipment of Four-wheeled Vehicles



Section 5 Initiatives by Citizens' Groups

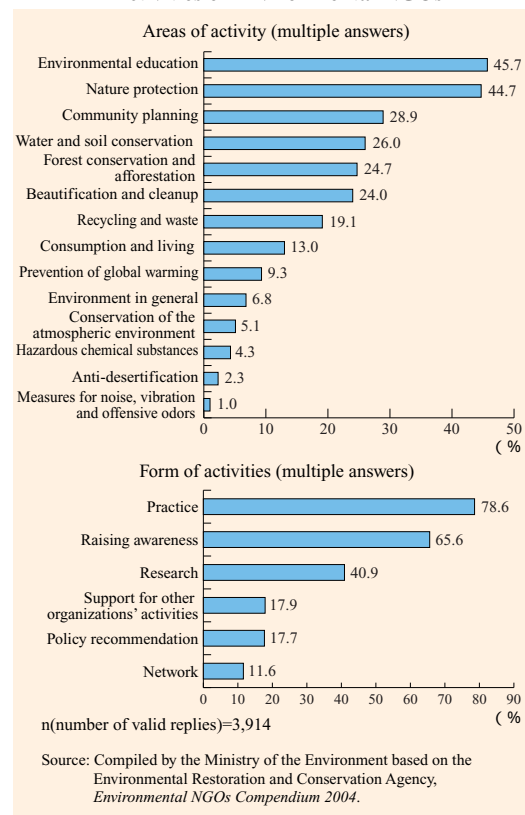
Today, throughout the country, citizens are getting together for various activities related to environmental conservation. The role played by such gatherings, or citizens' groups, is becoming increasingly greater.

According to *Environmental NGOs Compendium (2004)* published by the Environmental Restoration and Conservation Agency of Japan (ERCA), an independent administrative institution, environmental NGOs are most active in the field of "environmental education" (45.7%), followed by "nature protection" (44.7%), "community planning" (28.9%), and "water and soil conservation" (26.0%).

Citizens' groups involved in environmental education and learning cover a wide range of activities, including development of teaching materials, dispatch of lecturers, and implementation and coordination of programs. Such activities and programs are developed and offered to suit different targets, such as citizens, schools, children, and businesses.

Among citizens' groups undertaking environmental conservation activities, some take advantage of their expertise to make various proposals and recommendations. For example, Kiko Network (NPO), whose main objective is to promote climate change prevention, has been making policy recommendations, participating in international negotiations and lobbying, and disseminating information. As policy recommendations, it has proposed effective domestic policies and concrete methods to the government for achieving the 6% reduction commitment of the Kyoto Protocol. Kiko Network also carries out studies and develops proposals aimed at the early introduction of a carbon tax.

Activities of Environmental NGOs



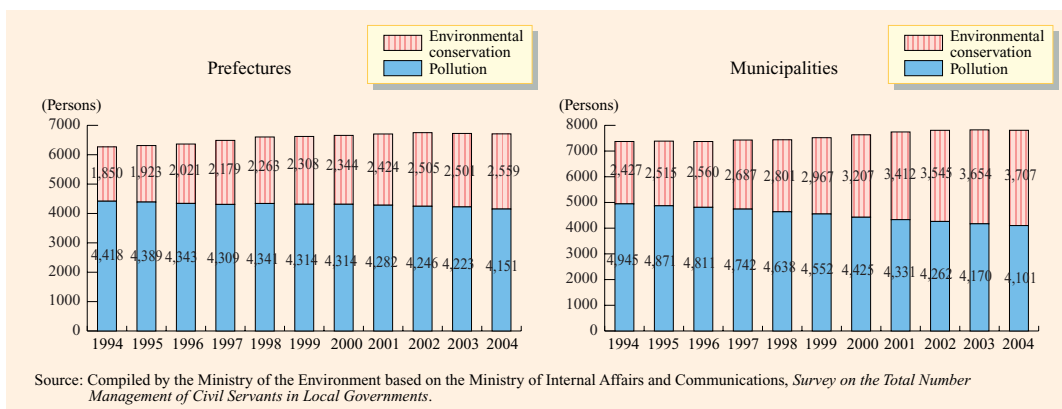
Section 6 Local Initiatives

Local governments are expected to play the role of developing “systems” and “people” that encourage individuals and local actors (companies and citizens’ groups) to reduce environmental load in their daily living and business activities.

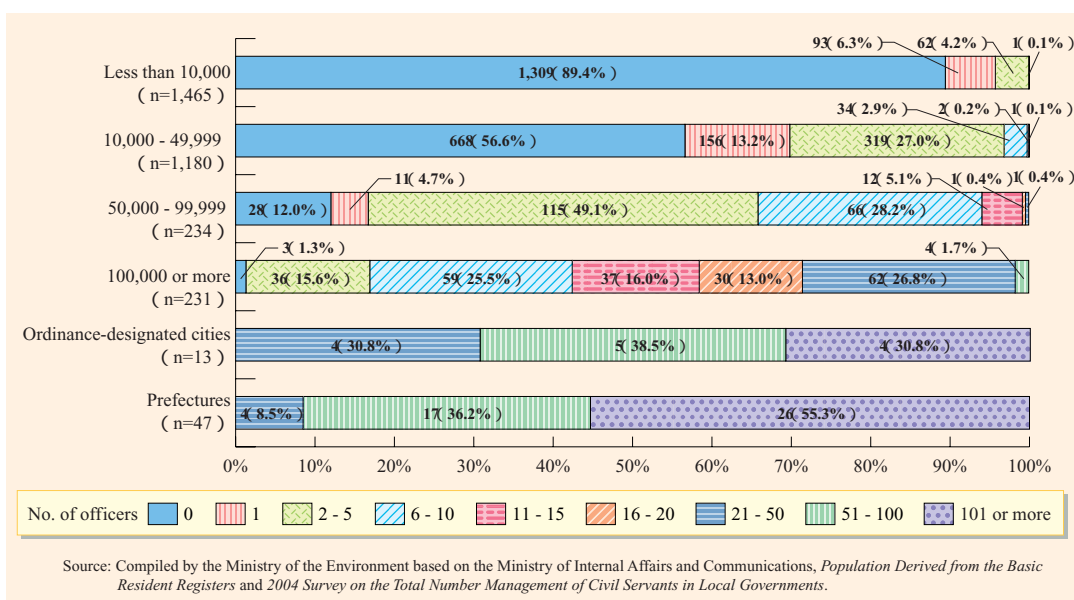
Fundamental environment ordinances and basic environment plans that clarify the basic concepts and policies of local governments are currently under preparation throughout the country. In Hirosaki, Aomori Prefecture, the “Hirosaki Basic Environment Plan (Hirosaki Agenda 21)” was formulated with the participation of citizens in March 2001. In order to promote the plan, the city concluded an agreement with “Hirosaki Environment Partnership 21” (HEP21), an independent citizens’ organization, and jointly held courses and lectures, as well as citizens’ forums organized by HEP21. The city pays the working expenses of HEP21.

While the total number of local government staff has been decreasing in recent years, the number of officers listed under the environmental conservation and pollution sections has been on the increase. In the 11 years between 1994 and 2004, the figure increased by 7% in prefectures and 6% in municipalities. The number of staff is growing in larger local governments. In the case of many small local governments, however, they have no officers specializing in environmental conservation. Thus, the question is how to promote environmental administration in small local governments.

Number of Officers in the Environmental Conservation and Pollution Sections in Prefectures and Municipalities



Number of Officers in the Environmental Conservation and Pollution Sections by Population Size



Chapter 3

People and Systems for Shaping a New Era – and Building a Network

<Summary of Chapter 3>

This chapter discusses ways of cultivating people and devising systems for building a sustainable society in a new era.

Cultivating people and systems that facilitate environmental conservation and the creation of a network in which all actors of society are linked to each other will eventually lead to the realization of an environmentally advanced nation in a new era.

Section 1 People for Shaping a New Era

1. People Who Can Act with Environmental Consideration – Cultivating the Spirit of “Mottainai”

Today’s environmental problems have two dimensions; they expand spatially on a global scale and extend in time over future generations. In view of the unprecedented nature of these problems, it is necessary to cultivate people with the ability to think independently of the causes of the problems and finding their solutions and address them on their own initiative. To this end, environmental education is of great importance.

In environmental education, building the capacity to act on one’s own is as important as acquiring knowledge and deepening understanding. The aim of environmental education is to train people to be aware of the relationship between human beings and the environment and to be responsible for their own behavior, thus encouraging them to work toward creating a sustainable society. It is hoped that such people will carry out daily living and activities with environmental consideration as a responsible member of the family and local community, and take positive actions in dealing with environmental issues.

The expression *mottainai* does not simply mean to use less, but implies a feeling of regret that the intrinsic value of a thing or its function is not thoroughly used. Eliminating energy waste and using a thing to its fullest through the practice of “reduce, reuse, and recycle” is in line with the spirit of *mottainai*. Encouraging people to respect the spirit expressed in *mottainai* and to translate it into practice will lead to realizing a society in which environmental load is reduced while maintaining affluence.

2. Groundwork for Cultivating People

Lack of information on teaching methods and appropriate teaching materials is often pointed out by those providing environmental education. To promote environmental education even further, it will be necessary to establish concrete methods for implementation, train education providers, and develop information resources and bases for carrying out environmental education.

To promote environmental education, firstly, it is necessary to organize environmental education programs that facilitate concrete actions. It is desirable that environmental education programs are developed under the cooperation between home, schools, businesses, citizens’ groups, and the government, systematically organized with clear objectives for each learning stage, incorporating elements of play and hands-on experience, according to themes and children’s development stage and comprehension.

It is also vital to train experts and coordinators in charge of environmental education. In addition to scientific knowledge of the environment, teachers are required to have a fair attitude and the ability to make comprehensive value judgments based on broad knowledge.

Furthermore, it is necessary to establish and provide an information infrastructure and to make effective use of environmental learning bases.

Section 2 Systems for Shaping a New Era

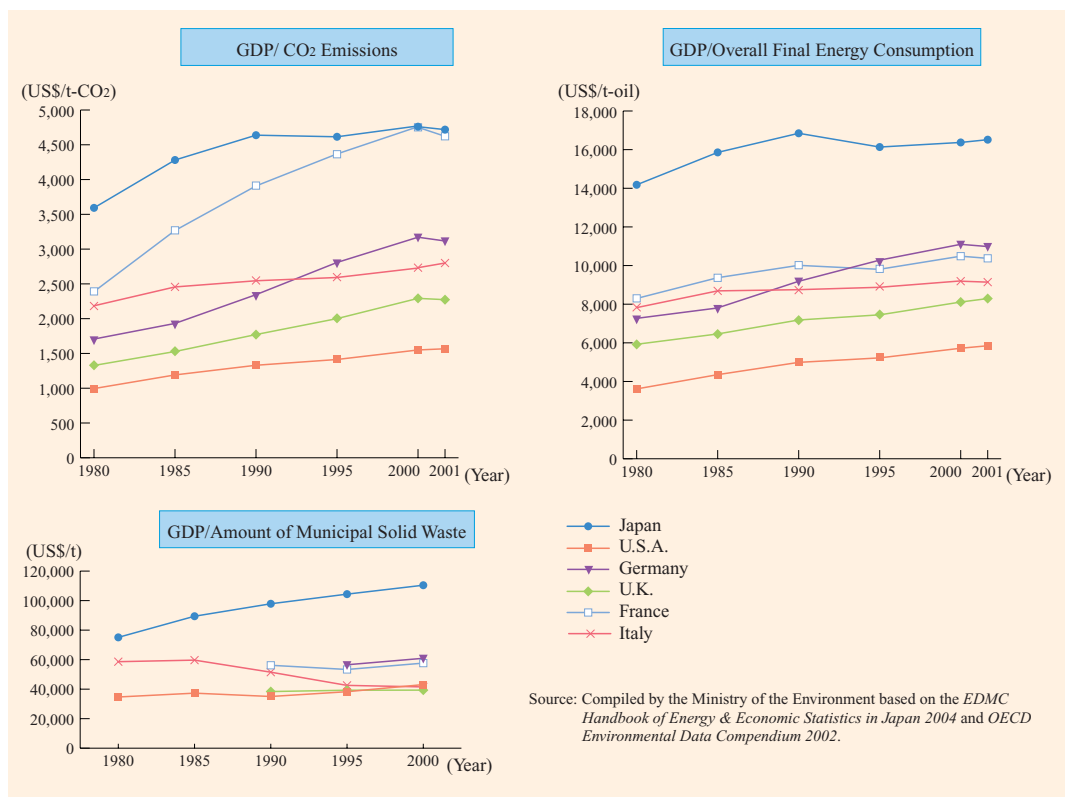
1. Environmental Policy for Shaping a New Era

(1) Policy Concepts for Shaping a New Era

A. Relationship between the Environment and Economy

The Basic Environment Plan emphasizes the importance of the idea of integrating the environment and economy in building a sustainable society. In an effort to maximize the efficiency of resources and energy use and reduce the environmental load per unit of economic activity, the concept of eco-efficiency, expressed in environmental load per unit of economic activity, has been brought forth.

International Comparison of Changes in Eco-efficiency



It is also necessary to control generation of environmental load as much as possible throughout the entire product lifecycle, from extraction of raw materials, manufacturing, distribution and use, to recycling (proper disposal of wastes). For this purpose, the concept of “extended producer responsibility” has been introduced, positing that the producer has a specific responsibility, both physically and financially, for the proper recycling and disposal of its products, even after a product is used and disposed of. There is also the concept of “environmentally sensitive design (eco-design)” that aims to improve the eco-efficiency of the overall product lifecycle through product design, production technology and system management.

In addition, the concept of “dematerialization” calls for reducing resource consumption in economic activities by offering only the functions of a product, instead of marketing the product itself.

B. Relationship between the Environment and Society

Population growth and the expansion and sophistication of socio-economic activities are causing rapid increases in the consumption of energy and resources. It is necessary to examine social structures from the standpoint of sustainability. It is also required to incorporate environmental consideration into all aspects of society. The policy of “integration of the environment and society” can be approached, for example, through the relationship between

“environment and poverty” because environmental conservation helps to create a better society, or “environment and disaster prevention,” which looks at environmental problems and social problems in an integrated manner and devises countermeasures accordingly.

C. Restoring the Environment

As attempts to restore natural environment lost in the past, efforts by citizens’ groups to create biotopes, and nature restoration projects by ministries and agencies have begun in many parts of the nation. As for lakes and reservoirs, the bill for making partial amendment to the Law concerning Special Measures for the Preservation of Lake Water Quality was submitted to the 162nd Diet in order to promote implementation of measures for reducing pollution from urban areas and agricultural land and to adopt measures for the proper conservation of the lakeside water environment. Thus, improvement of the water environment is expected.

(2) Policy Measures for Shaping a New Era

Environmental problems are caused by complex factors, and they affect a wide area. Scientific uncertainty exists in explaining the mechanism and extent of environmental impact. Thus, decision-making principles become important.

One key principle of decision-making is environmental risk management. It forecasts the possibility and scale of impact on the environment based on scientific knowledge, assesses and judges the need and urgency of implementing measures, and implements the required measures. It is also essential to incorporate the principle of “precaution” in decision-making in cases where scientific uncertainty exists in the mechanism and extent of environmental impact.

(3) Viewpoints in Policy-Making for Shaping a New Era

As today’s environmental problems are closely related to the economy and society, it is essential that all actors recognize their own responsibility towards the environment and act fairly according to each of their roles and positions. Making environmental policy decisions with the participation of citizens not only enables the selection of more appropriate policy measures, but also helps to raise the environmental awareness of citizens, thus realizing a society in which citizens voluntarily work towards environmental conservation.

Local viewpoint is also important. By conducting community level activity to understand the condition of local resources and promoting cooperation among local actors, all actors of the community can share a common direction or goal, resulting in enhanced awareness and capability for creating a better environment and a better community. Such enhanced awareness and capability of a community as a whole is called “local environmental preparedness,” and it is important to take advantage of such powers in building sustainable communities.

It is also important to carry out regional environmental activity in Asia with both Japan’s and global environmental conservation in perspective. As Japan has overcome serious pollution problems in the past and has been making pioneering efforts in realizing a virtuous circle for environment and economy, it should take the lead in promoting comprehensive and strategic environmental conservation in the Asian region.

2. Japan’s Environmental Policy as a System

(1) Building a Low Carbon Society

Following the entry into force of the Kyoto Protocol in February 2005, the Kyoto Protocol Target Achievement Plan was formulated in April, based on the Climate Change Policy Law, establishing measures required for ensuring achievement of the 6% reduction commitment. The plan calls for fundamental re-examination of urban/regional structures and transport systems, thus incorporating the efficient use of energy in the socio-economic structures and systems. It also includes various efforts by each facility and actor aimed at overall reduction of CO₂ emitted in relation to their activities, as well as forest sink measures. In addition, cross-sectoral measures including dissemination of knowledge and promotion of people’s movements are listed. The plan also proposes making use of the concept of policy mix under which serious comprehensive examination of environmental taxes is called for.

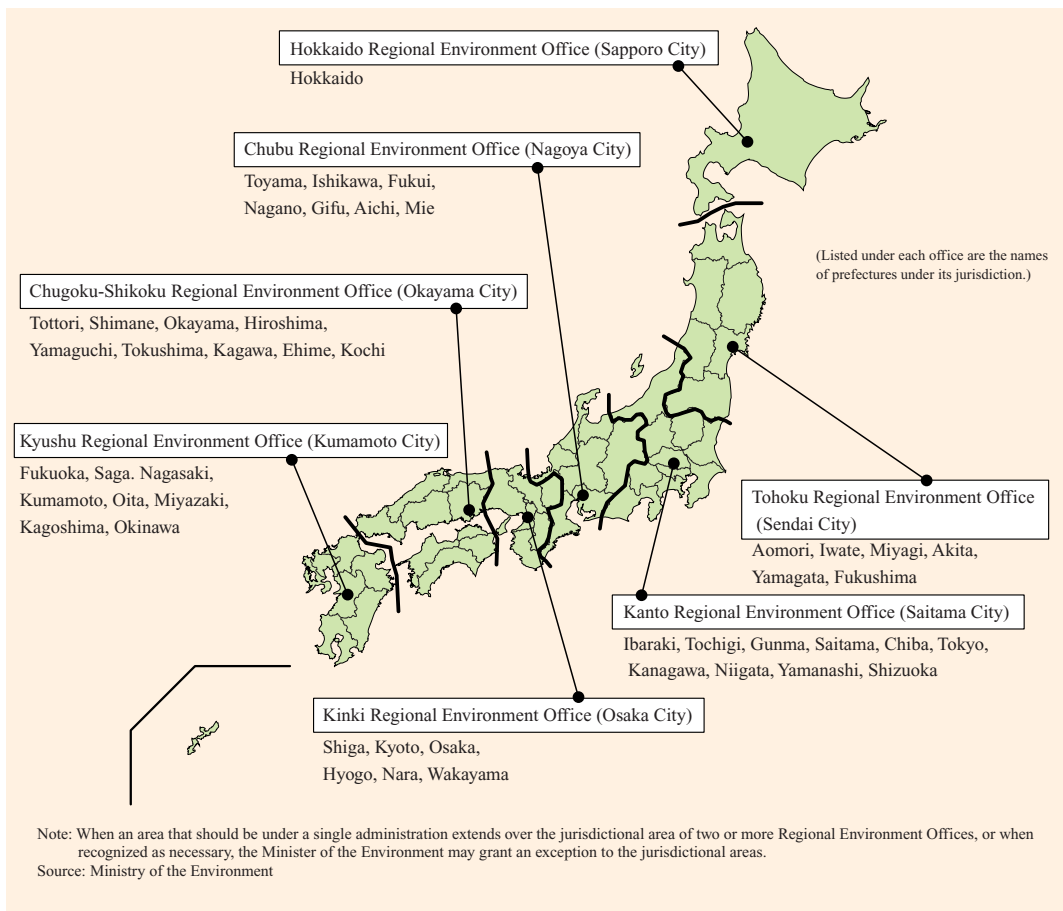
(2) Building a Sound Material-cycle Society

At the G8 Summit held in Sea Island, Georgia, U.S.A. in June 2004, Japan's Prime Minister Koizumi proposed the "3R Initiatives" aimed at building a sound material-cycle society through the 3Rs (reduce, reuse, and recycle), winning the consensus of heads of other nations. Based on this agreement, a ministerial meeting for launching the 3R Initiatives was held in Tokyo between April 28 and 30, 2005.

3. Environmental Administration through Cooperation between Central and Local Governments

In line with the recent moves toward administrative reform including the decentralization, systems in which central and local governments can jointly and positively tackle environmental problems are being established. These systems can help realize effective environmental administration at the local level. They also become a basis for creating a better environment, which in turn leads to a better community. For example, in FY 2005 the Ministry of the Environment instituted a system for central and local governments to prepare a plan to promote the creation of a sound material-cycle society, by exchanging opinions from the planning stage, and to pursue comprehensive and regional facility development. In addition, the Ministry of the Environment will open Regional Environment Offices in the seven regional blocks of the country in October 2005 in order to facilitate environmental administration that meets regional needs and conditions.

Location of the Regional Environment Offices and Their Jurisdictions



Section 3 A Network Linking Actors

1. Environmental Information as a Base

Environmental information provides the recipient with an opportunity to become interested in and think about environmental issues, enhancing environmental awareness and triggering environmental conservation activities.

The act of disseminating environmental information itself helps to promote one's own environmental conservation activity. For example, when a business operator grasps the actual situation of the environmental load his business generates, he will be able to implement more effective environmental control. Moreover, by disclosing environmental information to the public, it becomes possible to evaluate one's company's environmental conservation activities by comparing them with other companies, serving as an incentive for further reduction of environmental load.

In addition, through two-way exchange of environmental information, mutual understanding is deepened, giving birth to better ideas for solutions. These solutions will have a greater environmental conservation impact than the one-way communication. Some companies set up venues for dialogue with the general public, using their environmental reports as a material.

All actors, including the government, businesses, and citizens' groups, are sending out various kinds of environmental information through white papers, pamphlets, and the Internet. Of the environmental information provided by public institutions, those available on the Internet are listed by category in the table below.

Environmental Information Available on the Internet

Category	Contents/URLs	Originator	Information for:		
			Search	Learning	Action
General	General environmental policy http://www.env.go.jp/en/	Ministry of the Environment			
	General environmental policy http://www.meti.go.jp/english/index.html	Ministry of Economy, Trade and Industry			
	Environmental Statistics http://www.env.go.jp/doc/toukei/ (Only in Japanese)	Ministry of the Environment			
	General environmental information http://www.eic.or.jp/ (Only in Japanese)	National Institute for Environmental Studies			
	General environmental information http://eco.goo.ne.jp/ (Only in Japanese)	Environmental goo			
	Environmental partnership http://geic.hq.unu.edu/	Global Environment Information Centre			
Environmentally conscious lifestyle	Wa-no-kurashi http://www.wanokurashi.ne.jp/ (Only in Japanese)	Ministry of the Environment			
	Re-style http://www.re-style.jp/ (Only in Japanese)	Ministry of the Environment			
	Green purchasing http://www.gpn.jp/English/index.html	Green Purchasing Network			
Environmental education	Information on environmental education http://www.eeel.jp/ (Only in Japanese)	Ministry of Education, Culture, Sports, Science and Technology, Ministry of the Environment			
Business	Environmental report http://www.kankyohokoku.jp/y_eng.asp	Ministry of the Environment			
Global warming	Global warming http://www.jccca.org/en/	Japan Center for Climate Change Actions (JCCCA)			
	Information on energy saving http://www.eccj.or.jp/index_e.html	Energy Conservation Center, Japan			
	Information on new energy http://www.nedo.go.jp/english/index.html	New Energy and Industrial Technology Development Organization			
Waste and recycling	Waste and recycling http://www.cjc.or.jp/ (Only in Japanese)	Clean Japan Center			
Air	Atmospheric environment and asthma http://www.erca.go.jp/english/index.html	Environmental Restoration and Conservation Agency			
Natural environment	Internet Nature Institute http://www.sizenken.biodic.go.jp/	Ministry of the Environment			

Notes:

Search: contains pages mainly for searching for relevant information

Learning: contains pages mainly for explaining related information in detail for learning and research

Action: contains pages mainly for disseminating information for environmental conservation activity at home and in the local community

Source: Ministry of the Environment

2. Building Environmental Partnerships

Environmental partnership refers to working as equals in activities through mutual cooperation and appropriate division of roles of each actor, under the common objective of solving environmental problems in a community or society. Each of these activities serves as the driving force for building an environmentally advanced nation.

In environmental partnerships, it is important for participating actors to form a relationship of “equals” based on appropriate division of roles, instead of providing one-way support or cooperation. To build environmental partnerships on equal terms, actors must share in advance the understanding of the objectives of working together and of its merits for each actor. Greater synergetic effects can be attained when actors recognize each other’s functions and resources, fields of expertise, and differences in know-how, and take advantage of strengths and make up for limitations of different actors. In addition, before cooperating in activities with mutual respect, each actor must confirm its own objectives and philosophy and carry out substantial activities. Without conducting its own activities, it would be difficult for any actor to provide others the results and know-how, and further deepen a relationship based on mutual trust.

(1) Building the Foundation for Promoting Partnership Activities

For building better partnerships, provision and exchange of information, coordinators, and development of bases and venues are necessary to facilitate finding and matching partners and promoting communication for mutual understanding.

As a base facility for environmental partnerships, the Ministry of the Environment has been operating the Global Environment Information Centre since 1996 in cooperation with the United Nations University in Aoyama, Tokyo. In addition to this, regional Environmental Partnership Offices, regional bases for linking local bases with national ones, are being set up in Osaka, Hiroshima, Nagoya, and other major cities. Local base facilities do not necessarily have to be newly opened. It is possible to make use of existing educational facilities, such as schools, community centers, and environmental learning facilities already established in each community. In addition to these bases serving as venues, functional bases that link actors, adjusting the roles and methods of each actor, are also important. Transcending the positions and fields of participating actors and building trust, such bases are expected to play the role of “intermediary supporting organizations” for expanding opportunities of partnerships by exchanging and sharing information on actors’ activities and environmental information, including resources and needs, and for facilitating their activities.

(2) Expanding Partnerships

Efforts to build partnerships have already begun throughout the country, taking advantage of tools shown above. Some organizations have successfully formed effective partnerships and are in process of further development.

In Ota Ward, Tokyo, “Eco-festa Wonderland” is held every year at a local elementary school as an event for raising environmental awareness. Held in cooperation with local schools, businesses, NPOs, and government agencies, this event is used as a venue for citizens to have fun learning about the environment through various environmental conservation activities introduced. They included presentations on environmental learning, eco cooking, and experiments on energy topics, undertaken by schools, companies, and citizens’ groups. Taking advantage of the relationship built through this event, one major company participating in the event has begun to plan and implement an environmental education event in cooperation with a local NPO and government agencies. An event centering on a school has grown into a larger undertaking built on a partnership



Presentation on environmental learning

Photo: courtesy of Ota Ward, Tokyo

involving local government agencies, businesses, and citizens' groups.

It is hoped that environmental partnerships will expand throughout communities all over the country. Schools as the nucleus of local communities can be utilized for exchange among families and local residents as the bases of their environmental conservation activities.

Imari Hachigame Plan ("Hachigame" is the local name for horseshoe crab in Imari region of Saga Prefecture) is a specified non-profit corporation founded in 1992 by the associations of local restaurants and hotels with the aim of utilizing their garbage and waste oil as resources.

In the initial stage, it conducted surveys and research with the cooperation of Saga University, the local chambers of commerce, and various other institutions, and succeeded in installing an experimental composting plant in 2000. Groups participating in the plan are increasing yearly, with those who offer food waste expanding to general households, nursery schools, and many others throughout the community. The finished organic compost is offered to local farmers, and high value-added organic farm products made with the compost are consumed in local restaurants and at homes. ([http://www6.ocn.ne.jp/~ hatigame/](http://www6.ocn.ne.jp/~hatigame/)) (in Japanese only).

Environmental partnership creates cooperation and synergy among various actors and leads to the realization of a sustainable society. It invigorates citizens' activities through environmental conservation and serves as a driving force for revitalizing communities. One such attempt is in "community development centering on the environment." Also, by assessing local needs, making decisions by working together with citizens, and implementing and managing projects with citizens, it becomes possible not only for local governments to choose more appropriate environmental policy, but also for citizens to realize a society where they voluntarily undertake environmental conservation activities.

In the future, it is hoped that these activities initiated in Japan spread throughout the world, and that international partnership in, for example, policy recommendation and global-scale environmental cooperation become even more active, thus leading to greater development of activities and eventually to realization of a sustainable society the world over.

—Conclusion: From the New Basic Environment Plan to an Environmentally Advanced Nation—

With the entry into force of the Kyoto Protocol on February 16, 2005, Japan, as a member of the international community, now has the obligation to fulfill its reduction commitment. Although not an easy task, Japan must keep its commitment, as it is the first step towards a low carbon society. Moreover, even after the commitment period of the Kyoto Protocol is over, it is necessary to continue reducing greenhouse gases over a longer period to stop ever-progressing global warming. To that end, with the collective wisdom of humankind, technological innovation must be promoted and each one of us must go through a consciousness revolution in order to expedite socio-economic transformation to reduce greenhouse gases in all our activities.

Currently, the government is re-examining the Basic Environment Plan, a comprehensive long-term plan on environmental conservation for the entire government. The New Basic Environment Plan will encourage all actors to aim at cultivating people so that they will voluntarily reduce environmental load such as greenhouse gases in all situations, and at devising systems that will enable transformation of socio-economic systems to incorporate environmental considerations. In building an environmentally advanced country, it is important to form environment partnerships through mutual cooperation of all actors. It is equally important to realize a virtuous circle for environment and economy, which improves the environment by invigorating the economy. By demonstrating a model for growth based on a virtuous circle for environment and economy, Japan will be able to lead the world as an environmentally advanced nation. And all this begins with our consciousness and actions driven by a desire to conserve our environment.



Hands on training in composting
Photo: courtesy of Imari Hachigame Plan (NPO)

Part Two Current Environmental Issues and Environmental Conservation Measures by the Government

Part Two of the *Quality of the Environment in Japan 2005* (White Paper) introduces in the chapters below the environmental conservation policies and measures implemented in FY 2004 based on the state of environmental problems and in line with the Basic Environment Plan. Part Two of this booklet will report on the issues and current state of environmental problems in the major fields.

- Chapter One: Conservation of the Global Atmospheric Environment
- Chapter Two: Conservation of the Atmospheric Environment (not including the global atmospheric environment)
- Chapter Three: Conservation of the Water, Soil, and Ground Environments
- Chapter Four: Measures and Policies related to the Material Cycle, including Waste and Recycling Measures
- Chapter Five: Measures for Chemical Substances
- Chapter Six: Conservation of the Natural Environment and Promoting Contact with Nature
- Chapter Seven: Basis of Various Measures, and Measures Facilitating the Participation of Various Actors and International Cooperation

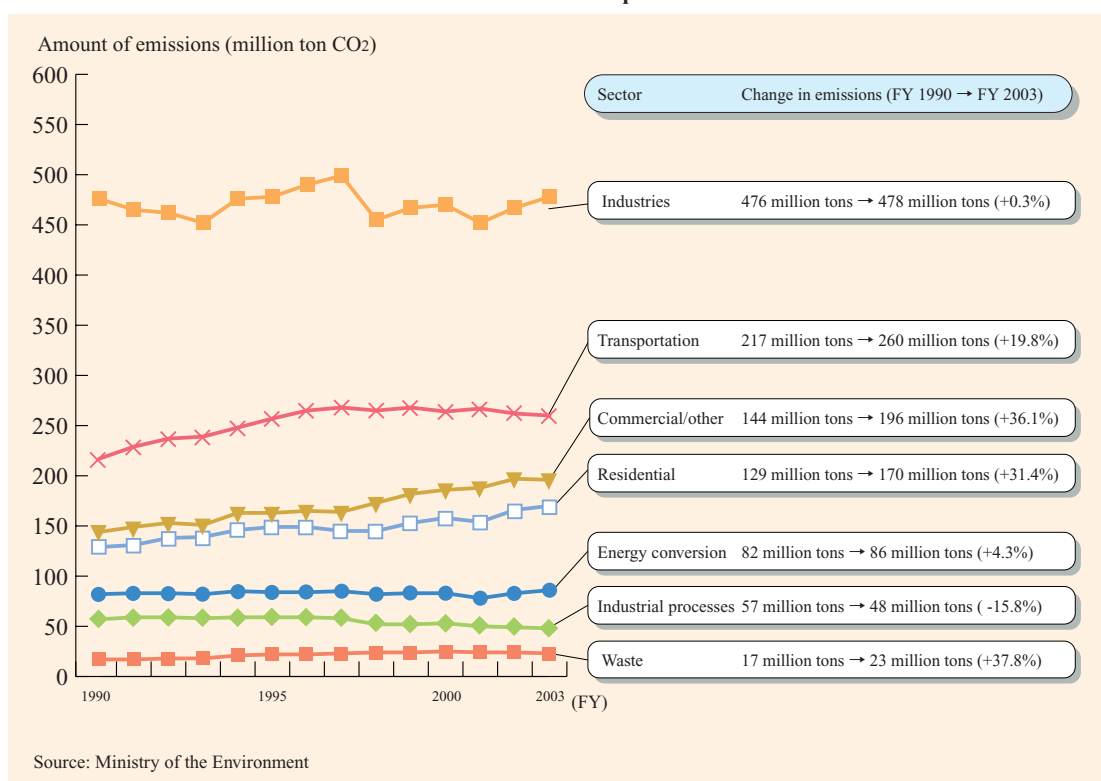
1. Conservation of the Global Atmospheric Environment

(1) Global Warming

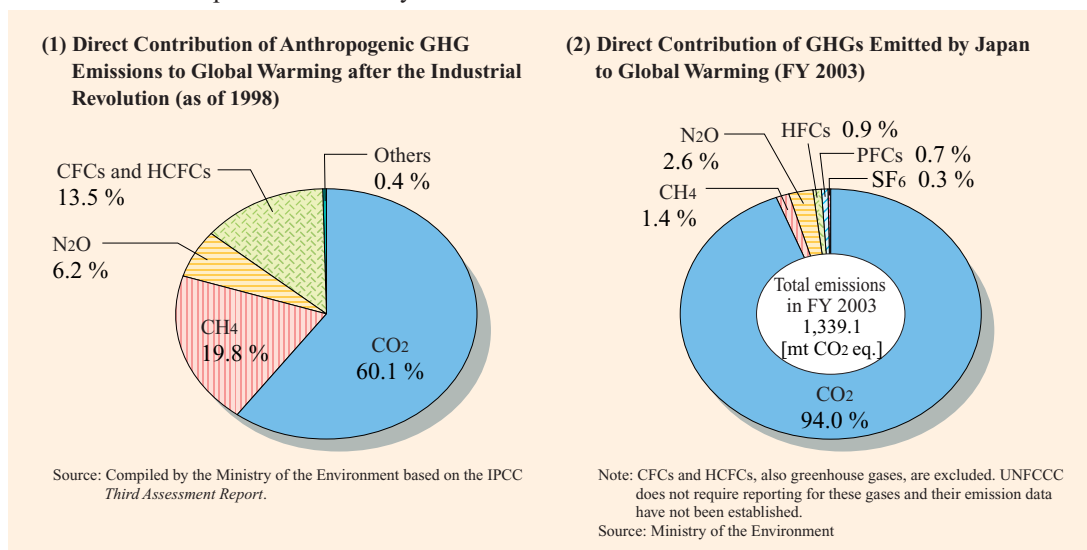
Expanding human activities have discharged vast quantities of carbon dioxide (CO₂), methane and other greenhouse gases (GHGs) into the atmosphere. In recent years, these gases have enhanced the greenhouse effect and given rise to the threat of global warming.

According to the *Third Assessment Report: Climate Change 2001* published by the Intergovernmental Panel on Climate Change (IPCC), the global mean surface temperature has increased by approximately 0.6°C over the 20th century, and consequently the mean global sea level has risen by approximately 10–20cm. The progress of global warming may have far-reaching and serious effects on the living environment of humans and the natural habitats of other living organisms.

CO₂ Emissions in Japan



Of the amounts of GHGs emitted in Japan in FY 2003, CO₂ emission was 1,259 million tons, with a per capita emission of 9.87 tons. Compared to the FY 1990 figures (the base year of the Kyoto Protocol), the total emission has increased by 12.2% and the per capita emission by 8.7%. A breakdown by sector shows that emission from the industries has increased by 0.3%, while that of the commercial and other sector has increased by 36.1%, the residential sector by 31.4% and the transportation sector by 19.8%.



In May 2002, Japan revised the “Climate Change Policy Law,” and ratified the Kyoto Protocol in June of the same year, which sets legally binding numerical targets for greenhouse gas emissions in developed nations. With the Russian ratification of the Protocol in November 2004, the conditions for the entry into force of the Protocol was fulfilled. Thus the Kyoto Protocol entered into force on February 16, 2005. One hundred and forty-nine countries and the EU ratified the Kyoto Protocol as of April, 2005.

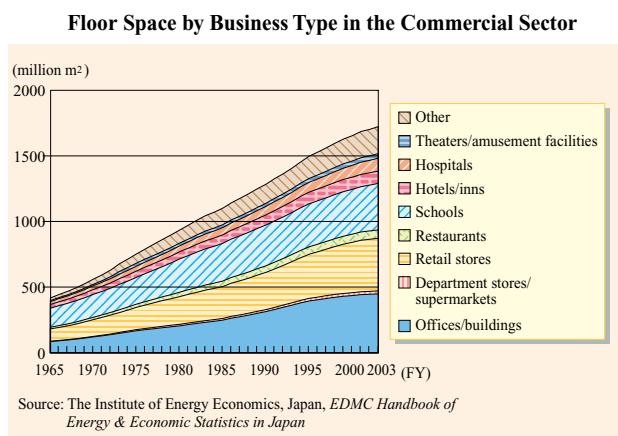
Because CO₂ arises from every aspect of human activities, curbing its emission requires collective efforts by all actors of society from national and local governments to business operators and each individual citizen. In pursuing measures against global warming, an effective mechanism for both economy and environment must be developed and established.

(2) Depletion of the Ozone Layer

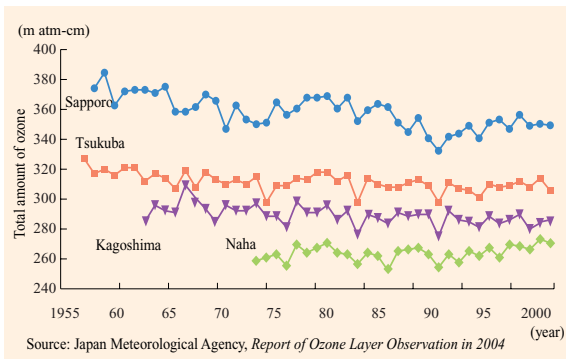
It has been known that the ozone layer is being destroyed by ozone-depleting substances such as chlorofluorocarbons (CFCs). There is concern that depletion of the ozone layer may increase the quantity of harmful ultraviolet radiation reaching the earth, causing growth impediment of organisms and health damages in humans such as skin cancer and cataracts.

The ozone layer is being depleted over almost the entire globe, except for the tropics. In Japan, a long-term depletion of the ozone layer has been observed above Sapporo, Tsukuba, and Kagoshima. The extent of decrease is especially notable above Sapporo. Over Antarctica, the largest scale of ozone depletion that ever appeared was recorded in 2003.

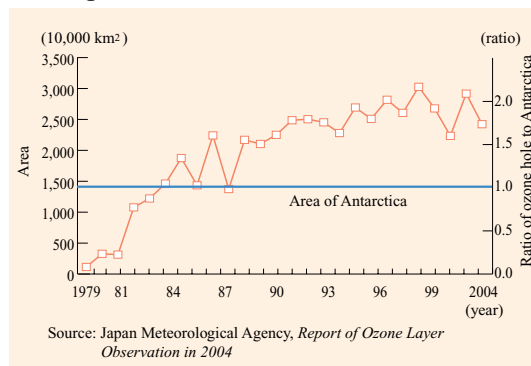
In Japan, in order to prevent further depletion of the ozone layer, the production of ozone-depleting substances is regulated pursuant to the Ozone Layer Protection Law. In addition, the recovery and destruction of fluorocarbons at the disposal stage of products are mandated by the Home Appliance Recycling Law, the Fluorocarbons Recovery and Destruction Law, and the End-of-Life Vehicle Recycling Law.



Changes in the Annual Average of Total Ozone Amount over Japan



Changes in the Size of Ozone Hole over Antarctica



2. Conservation of the Atmospheric Environment (not including the global atmospheric environment)

(1) Acid Deposition and Dust and Sandstorms

Acid deposition can produce various effects on the environment and living creatures such as trees or fish by increasing acidity in soil, lake water, etc. Buildings, artificial constructions and cultural assets can be affected by acid deposition. In the U.S. and Europe, acidification of lakes/reservoirs and the decline of forests caused by acid deposition have been reported.

In Japan, long-term monitoring of acid deposition is carried out to detect its effects as early as possible and to forecast the effects in the future.

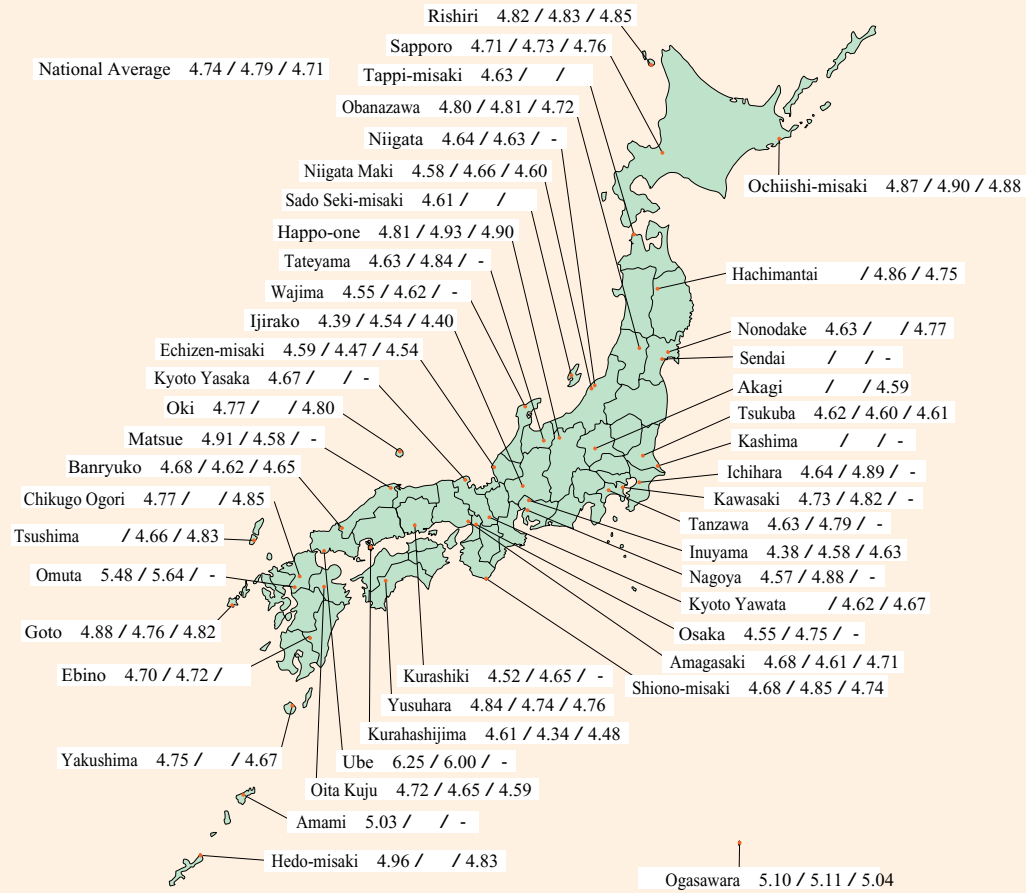
The monitoring results of acid deposition suggest that rain and snow are still as acidic in Japan as in the U.S. and Europe. However, at present, there is little reason to believe that acid deposition has caused any widespread damage to vegetation. As it is generally believed that the impact of acid deposition may take a long time to become apparent, it may surface in the future if the current level of acid deposition continues.

The Acid Deposition Monitoring Network in East Asia (EANET) started its activities on a regular basis in January 2001 to share a common understanding of the state of the acid deposition problems in East Asia and to contribute to cooperation on various issues related to acid deposition.

Dust and sandstorms (DSS) have been increasing both in frequency and intensity in Northeast Asia in recent years. Measures against DSS are a common concern for China, Korea, Japan and other countries in the region. Inside Japan, the government has stepped up the system of DSS monitoring. An international effort is also being made to study effective DSS prevention and control measures for the future, with the cooperation of four countries (China, Mongolia, Korea and Japan) and four international organizations, e.g. the United Nations Environment Programme, co-financed by the Asian Development Bank and the Global Environment Facility.

Levels of pH in Precipitation

FY 2001 average / FY 2002 average / FY 2003 average



- : No data

/ : Invalid data (disregarded based on the annual assessment criteria).

Note: For the Akagi area, annual averages cannot be calculated in years when heavy snowfall prevents data collection.

Source: Data from the Ministry of the Environment

(2) Photochemical Oxidants

Nitrogen oxides (NO_x) and volatile organic compounds (VOCs) emitted from factories, business establishments, and automobiles form primary pollutants, which react in the presence of sunlight (photochemical reaction) to form secondary substances such as ozone and other substances, known collectively as photochemical oxidants. Photochemical oxidants are the cause of photochemical smog, which causes eye and throat irritation and respiratory distress. In almost all regions throughout Japan, photochemical oxidants still exceed the EQS (a one-hour value of 0.06 ppm or less).

As one of the measures to combat photochemical oxidants, the Air Pollution Control Law was revised in May 2004 to control VOC emissions from factories. Adequately combining VOC's emission regulations and voluntary efforts by business operators, the revised law will be effective in harnessing VOC emissions. In FY 2006, VOC emitters will be required to notify VOC-emitting facilities and to meet regulatory standard values. There is also great expectation for the voluntary efforts of businesses. To control VOC emissions from automobile exhaust gas, regulations have been in place and stepped up successively in accordance with the Air Pollution Control Law.

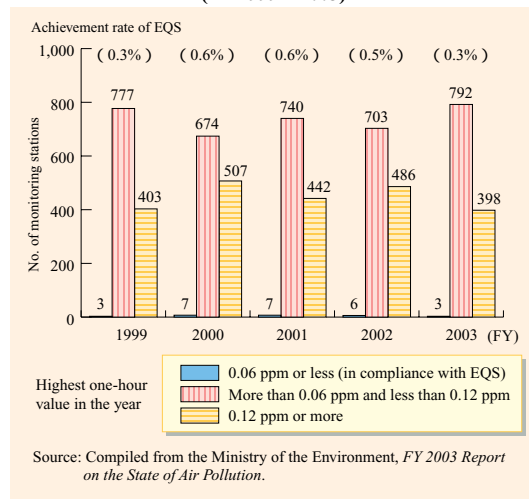
Through the Atmospheric Environmental Regional Observation System (nickname *Soramame-kun*), real-time data on the atmospheric environment is measured, and information concerning the issuance of photochemical oxidants alarms or warnings by local governments nationwide is collected and announced on the Internet.

(3) Nitrogen Oxides

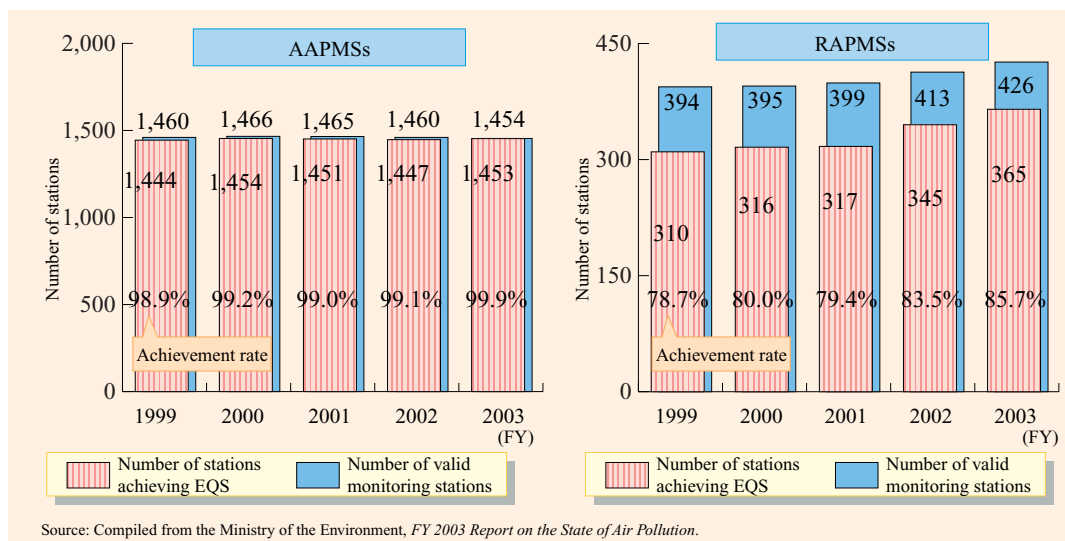
Nitrogen oxide (NO_x) is a by-product of combustion, generated mainly from stationary sources, such as factories, and mobile sources, such as motor vehicles. NO_x is a causal substance of photochemical oxidants, suspended particulate matter, and acid rain. Nitrogen dioxide (NO₂) at a high concentration may cause irritation to the respiratory organs and cause other harmful effects.

Compared to the previous year, the achievement rates of the EQSs for NO₂ in FY 2003 improved. The achievement rate of the ambient air pollution monitoring stations (AAPMSs) was 99.9%, and that of the roadside air pollution monitoring stations (RAPMSs) was 85.7%.

Changes in the Number of Monitoring Stations by Photochemical Oxidant Concentration Level (AAPMSs and RAPMSs) (FY 1999–2003)



Changes in the Attainment of the EQS for Nitrogen Dioxide (FY 1999 – 2003)



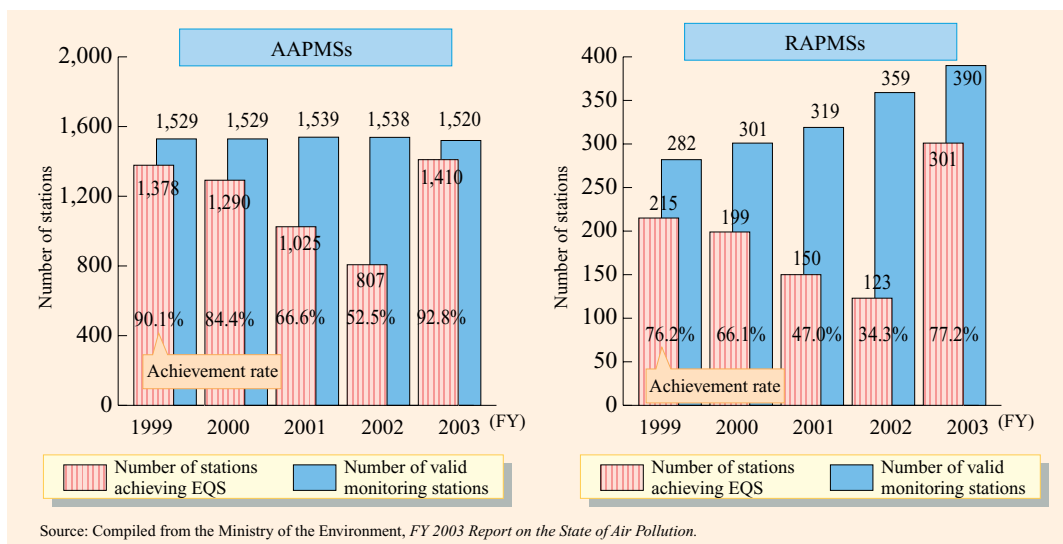
(4) Suspended Particulate Matter

Suspended particulate matter (SPM) in the air with a diameter of 10µm or less is classified into primary particles or secondary particles. Primary particles include soot and dust from factories, diesel exhaust particles (DEP) generated from diesel vehicles, and soil particles dispersed in the air. Secondary particles are those formed by chemical reaction

within the atmosphere from gaseous substances, such as nitrogen oxides (NO_x). Because SPM is of a minute size, it remains in the air for extended periods. An accumulation of SPM in high concentrations in the lungs or the trachea can have damaging effects on the respiratory system.

The achievement rates of the EQS for suspended particulate matter improved in FY 2003 compared to the previous year.

Changes in the Attainment of the EQS for Suspended Particulate Matter (FY 1999 – 2003)



Furthermore, studies are being conducted on fine particulate matter with a diameter of 2.5µm or less and diesel exhaust particles, because their impacts on human health have raised concerns in recent years.

(5) Hazardous Air Pollutants

Various chemical substances, though low in concentrations, have been detected in the atmosphere, raising concern about the health effects of long-term exposure to these substances. In FY 2003, the level of benzene exceeded the EQS at 33 monitoring points, 7.8% of the 424 total points.

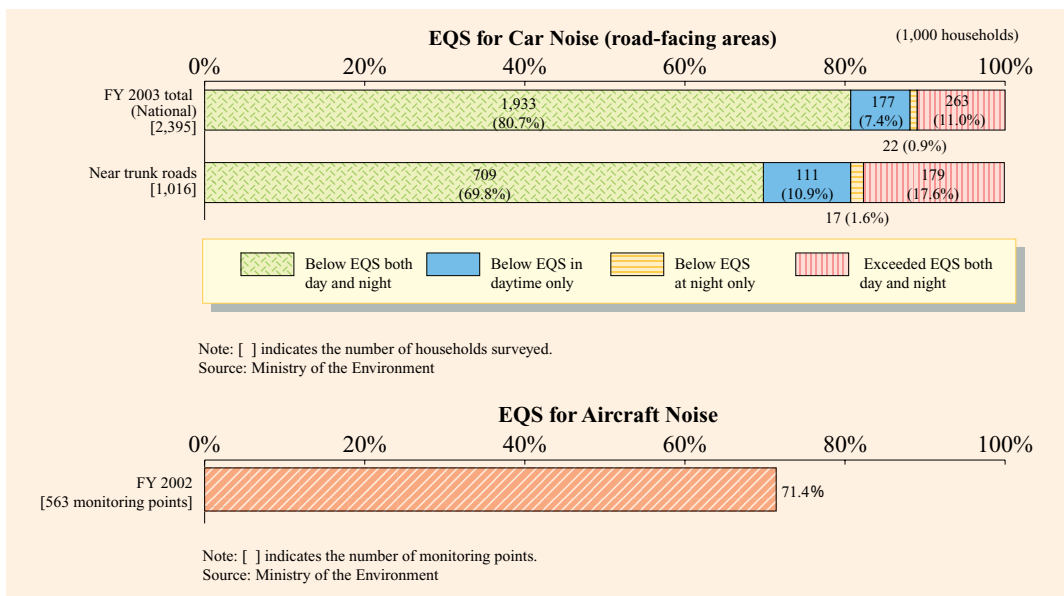
Pursuant to the Air Pollution Control Law, standards were set up to control the emissions of specified substances, such as benzene, and voluntary measures by businesses to control emissions were encouraged. Simple calculation of the total emissions of twelve substances that are targeted by the voluntary management plans in FY 2003 shows a substantial reduction rate of 57%, decreasing from approximately 38,000 tons in FY 1999 to 16,000 tons in FY 2003.

(6) Noise, Vibration, and Offensive Odors

Complaints about noise and vibration have increased gradually in the last few years, totaling 15,928 and 2,608 in FY 2003 respectively. Complaints about offensive odors, especially about open incineration, have increased drastically since FY 1997. The trend is on the rise in the last several years, reaching a record of 24,587 complaints in FY 2003.

For car noise in areas facing roads, the state of compliance with the EQS in FY 2003 was as follows: 1,933 thousand (80.7%) out of assessed 2,395 thousand households facing roads were within the satisfactory level stipulated by the EQS for both day and night. Among those household facing roads, 1,016 thousand households were near trunk roads, out of which 709 thousand households (69.8%) were within the EQS's satisfactory level. As for aircraft noise, 71.4% of households were within the satisfactory level the EQS in FY 2002.

Attainment of the EQS for Transportation Noise

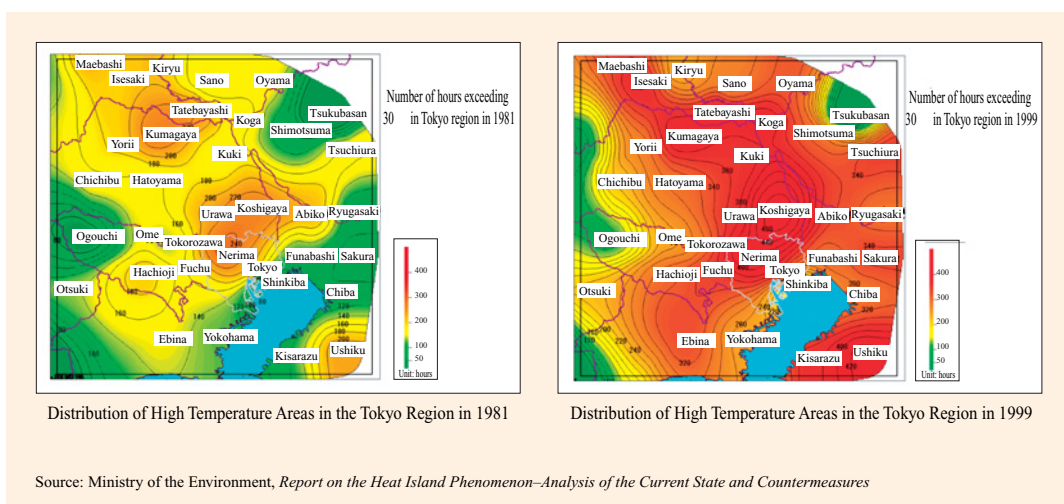


For noise and vibration coming from factories, business establishments, automobiles, and aircrafts, permissible limits and EQSs were set up pursuant to the Noise Regulation Law and the Vibration Regulation Law in order to impose restrictions.

(7) Heat Island Phenomenon

The heat island phenomenon occurs when the temperature rises more in urban areas than in surrounding suburban areas. This phenomenon results in an increase in the number of sultry nights in the summer. As waste heat from air conditioners raises the temperature, more energy is consumed as air conditioning works harder still, creating a vicious cycle.

Distribution of High Temperature Areas in the Tokyo Region (1981 and 1999)



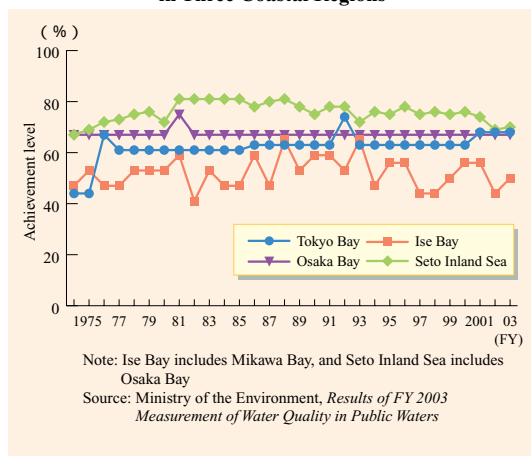
In March 2004, concerned ministries and agencies put together the “Outline of the Policy Framework to Reduce Urban Heat Island Effects” to facilitate policy implementation. The Outline consists of four pillars of measures, including the reduction of anthropogenic exhaust heat, improvement of urban surface, improvement of urban structure, and improvement of lifestyle.

3. Conservation of the Water, Soil, and Ground Environments

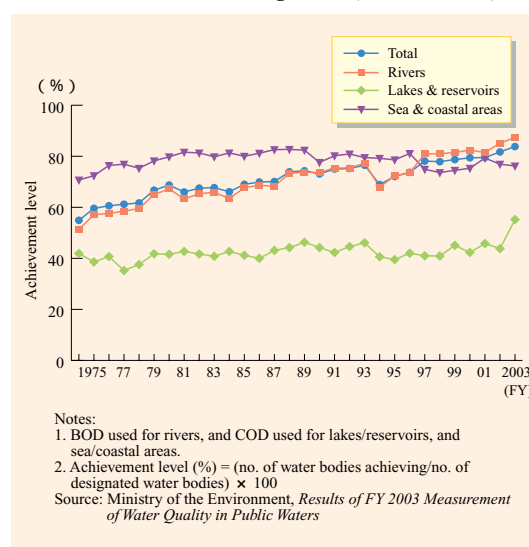
(1) Water Environment

According to the Results of FY 2003 Measurement of Water Quality in Public Waters, the achievement level of the EQS for the protection of human health from substances, such as cadmium, was 99.3%. Standards set for protecting the living environment were achieved at slightly lower rates. The BOD (or COD) level is an EQS for the conservation of the living environment and is a typical water-quality indicator for organic contamination. Its EQS achievement level remained at 83.8%. By water area, the achievement levels were 87.4% for rivers, 55.2% for lakes and reservoirs, and 76.2% for sea areas. In particular, the achievement rates for enclosed water areas, such as lakes, reservoirs, inner bays, and inland seas, were still low. In terms of COD, the achievement rates were 68% for Tokyo Bay, 50% for Ise Bay, and 70% for the Seto Inland Sea. Consequently a bill making a partial amendment to the Law concerning Special Measures for the Preservation of Lake Water Quality was submitted to the 162nd Diet in order to conserve the water quality of lakes and reservoirs further. It promotes measures to reduce the pollution load from urban districts and farmland in specified areas and to maintain the lakeshore water environment in a proper manner.

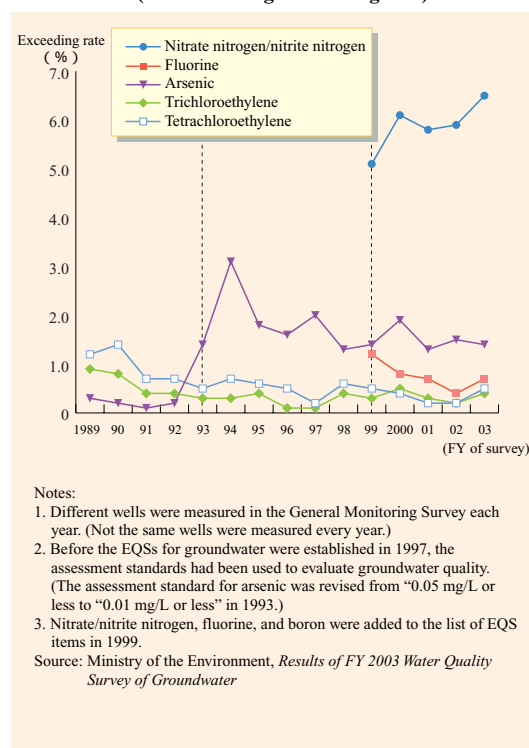
Trends in Rate of Achievement with EQS (COD) in Three Coastal Regions



Trends toward Achieving EQSs (BOD or COD)



Changes in Exceeding Rates to EQSs for Groundwater (Items with high exceeding rate)



According to the Results of the FY 2003 Water Quality Survey of Groundwater, the rate of exceeding the EQSs was 8.2% of the total wells surveyed. Especially, the rate of nitrate/nitrite nitrogen exceeding the EQS was 6.5%. The pollution was caused by farmland fertilization, domestic drainage, excreta of livestock, etc., and immediate measures are needed to deal with the groundwater pollution by nitrate/nitrite nitrogen.

The review of the Groundwater Management Methods for managing groundwater and supporting conservation plans, and the review of the Measures for Environmental Water Security for local waters that have experienced a decline in water flow are underway by the Inter-Ministry/Agency Coordination Committee for Building a Sound Water Cycle.

(2) Marine Pollution

For conservation of the marine environment, Japan has concluded the London Convention, which regulates the dumping of waste from ships at sea, and the MARPOL 73/78 Convention, which prevents marine pollution caused by ships. In response to these conventions, Japan has taken domestic measures to prevent marine pollution.

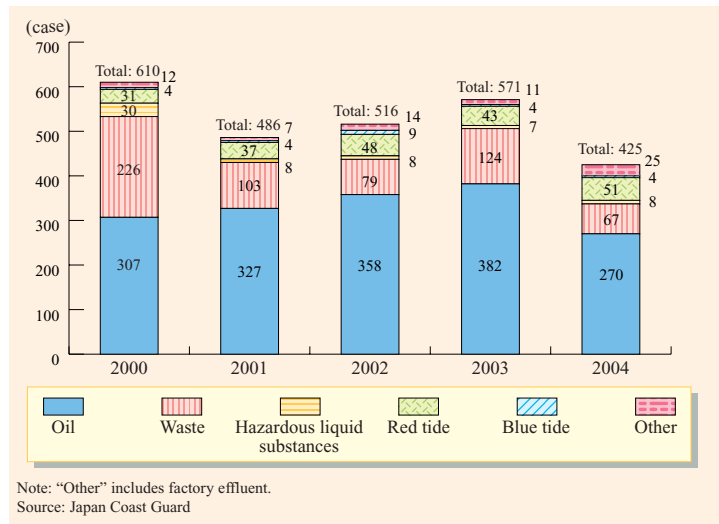
In order to assess and monitor the condition of the marine environment, data is being collected to determine the condition of water quality, bottom sediment, and aquatic organisms comprehensively and systematically.

In terms of pollution caused by oil, waste, and red tide, 425 cases were identified in 2004, a decrease of 146 cases from the 2003 total. Monitoring of drifting marine debris by sight indicated that most of such debris was petrochemical products such as foamed polystyrene and plastics. They were found in large quantities along the western coast of Kyushu.

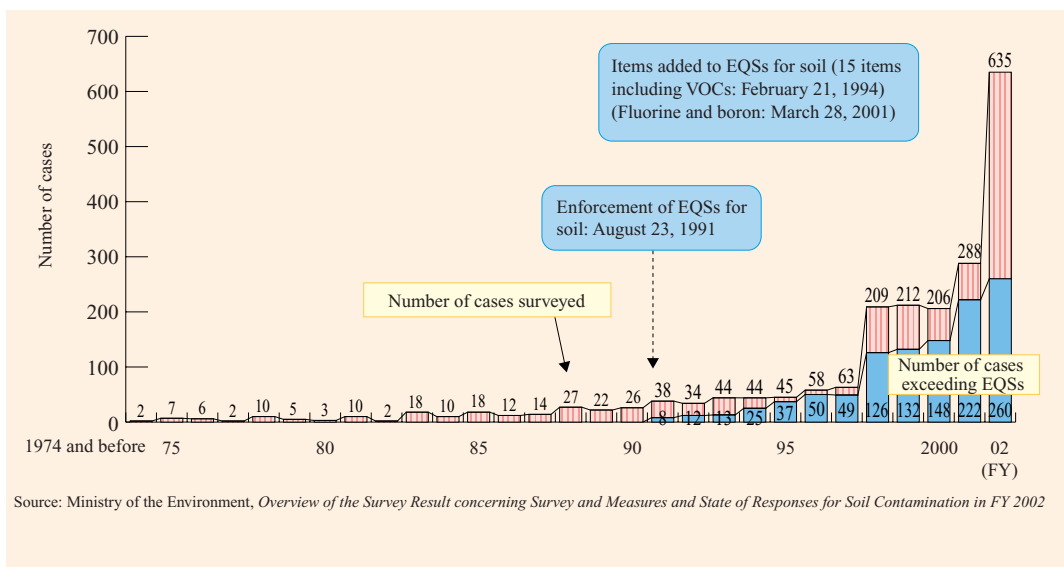
(3) Soil Contamination

Once soil is contaminated, it accumulates hazardous substances, perpetuating the state of pollution. In order to tackle such soil contamination, appropriate measures were sought based on the Soil Contamination Countermeasures Law. At the same time, studies were conducted to review the overall EQSs for soil, increasing targeted substances and exposure paths. In recent years, an increasing number of urban soil contamination cases have been found during the redevelopment of former factory sites. In FY 2002, 260 cases that failed to comply with the EQS for Soil Contamination were newly identified.

Changes in the Number of Identified Marine Pollution Cases



Number of Identified Soil Contamination Cases by Fiscal Year



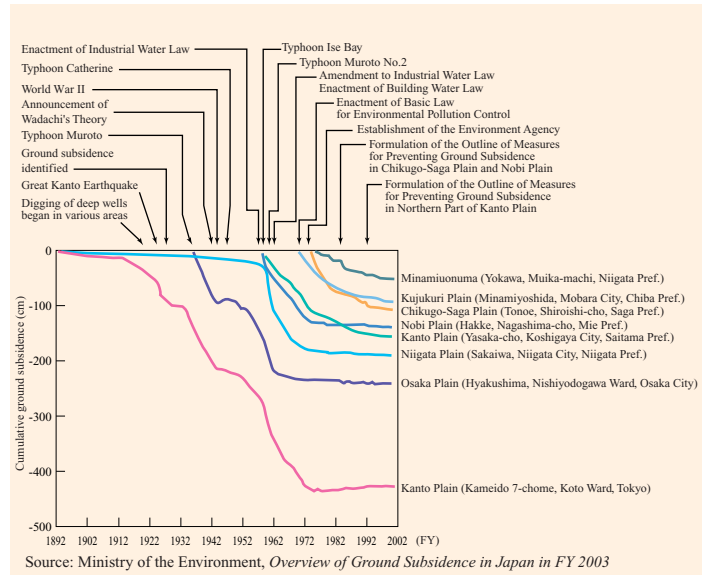
(4) Ground Subsidence

Ground subsidence is caused by excessive pumping of groundwater, which lowers the level of the groundwater and shrinks the clay layer. There were 61 areas in 37 prefectures that reported ground subsidence as of FY 2003. The restrictions on the pumping of groundwater and other measures have mitigated ground subsidence in the wards of Tokyo, Osaka City, and Nagoya City, where remarkable ground subsidence had occurred in the past.

However, ground subsidence has still occurred in certain areas such as the Kujukuri plain in Chiba Prefecture. Some areas that are lower than sea level due to ground subsidence may face the danger of

huge damages caused by high tides or floods. For this reason, besides imposing restrictions on the pumping of groundwater, measures are being taken to deal with high tides and to build facilities to protect the coastline.

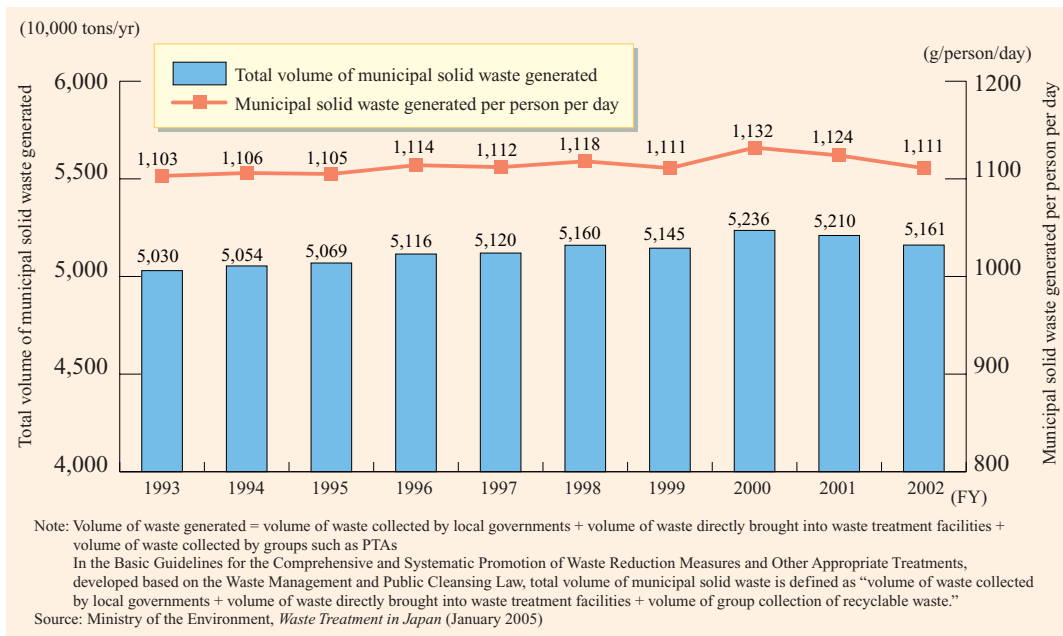
Changes in Ground Subsidence in Selected Areas



4. Measures and Policies related to the Material Cycle, including Waste and Recycling Measures

Since FY 1990, Japan has been generating municipal solid waste at an annual volume of approximately 50 million tons or more. These annual volumes have remained steady over the last several years. In FY 2002, of all municipal solid waste, direct incineration accounted for 78.4% and recycling accounted for 17.3%. The final volume disposed of at

Changes in the Total Volume of Municipal Solid Waste and Volume Generated per Person per Day



landfill sites was 9.03 million tons, a decrease of 920,000 tons from the previous year.

The total volume of industrial waste generated in Japan has also remained steady over the last several years. The volume in FY 2002 was approximately 393 million tons, a decrease of about 1.8 % from the previous fiscal year. Approximately 40 million tons were discarded at final disposal sites, a decrease of about 2 million tons from the previous fiscal year. Nationally, an average of 4.5 years of capacity in final disposal sites for industrial waste remained as of April 2003, presenting a serious situation.

To solve these problems, it is necessary to implement waste and recycling measures, taking into account the following priorities stipulated in the Fundamental Law for Establishing a Sound Material-Cycle Society: (i) reduce waste, (ii) reuse end-of-life products and parts, (iii) recycle as raw materials, (iv) recover heat, and (v) appropriately dispose as final waste. In line with this basic principle, the Waste Management and Public Cleansing Law and various recycling laws have been steadily enforced.

In terms of the illegal dumping of industrial waste in Japan, the number of cases with volume over 10 tons was 894 in FY 2003, showing a decline following the previous year. The total volume of illegal dumping, on the other hand, reached 745,000 tons, including about 567,000 tons found in Gifu City in March 2004. This volume set the record as the highest total since the survey started in FY 1993.

To tackle these issues, the government made a partial amendment to the Waste Management and Public Cleansing Law in 2004. The Law strengthens the government's role to help resolve cases of improper disposal of waste. It also establishes provisions to punish those who improperly dispose of specified hazardous waste (sulfate pitch) and those who collect and/or transport waste with the intention of illegal dumping. These various provisions of the Law were enforced in succession until all were in force by April, 2005. In March of the same year, a bill to make another partial amendment to the Waste Management and Public Cleansing Law and Other Laws was submitted to the 162nd Diet in order to step up measures to tackle improper disposal of waste, such as large-scale illegal dumping and unauthorized export, and to establish more effective administrative systems. The bill proposes streamlined administrative practices in cities with public health offices, a strengthened industrial waste manifest system, and harsher penalties for waste exports that have evaded mandatory authorization procedures.

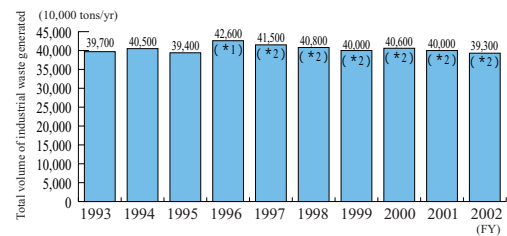
5. Measures for Tackling Environmental Risk from Chemical Substances

Among the more than several tens of thousands of chemical substances in circulation in Japan today, some may be harmful to human health and to ecosystems if they are not properly managed and may pollute the environment during the various stages of production, distribution, consumption, and disposal.

In order to prevent these harmful effects, the environmental risk (possible interference with environmental conservation) of these chemical substances must be assessed and appropriate measures must be taken.

The partial amendment to the Chemical Substances Control Law, which came into force in April 2004, introduced prior evaluation procedure and regulation of chemical substances from the viewpoint of eco-toxicity in addition to human health. It also introduced measures for persistent and highly bio-accumulative existing chemical substances and

Changes in the Volume of Industrial Waste Generated

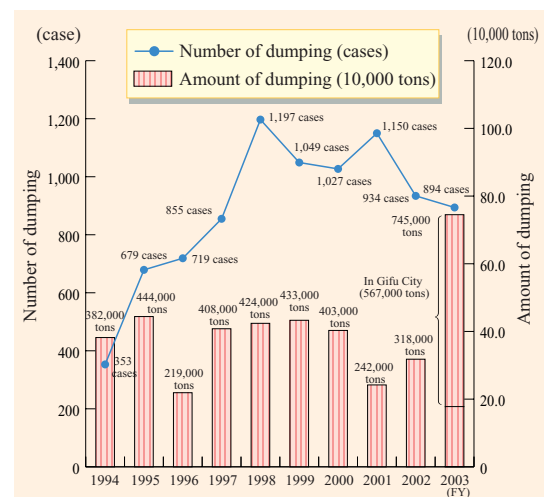


Notes:

- (*1) indicates the amount of waste generated in FY 1996, calculated based on the "Target of Waste Reduction" (government decision, September 28, 1999) - target for FY 2010-compiled pursuant to the Basic Policy for Dioxins Measures.
- (*2) The amount of waste after FY 1997 was calculated using the same calculation conditions as *1.

Source: Compiled from the Ministry of the Environment, *State of the Generation and Treatment of Industrial Waste (FY 2002 Results)*.

Changes in the Number of Cases and Amount of Illegal Dumping

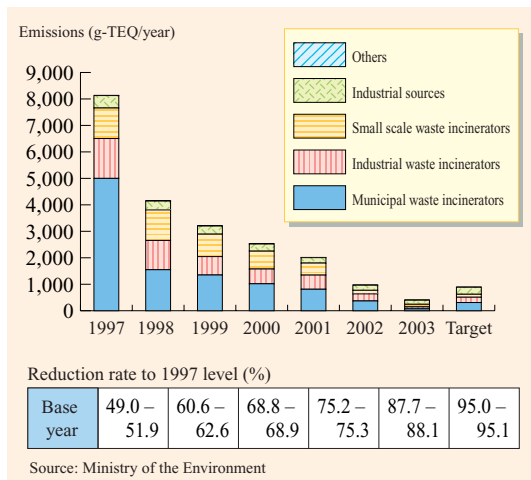


Notes:

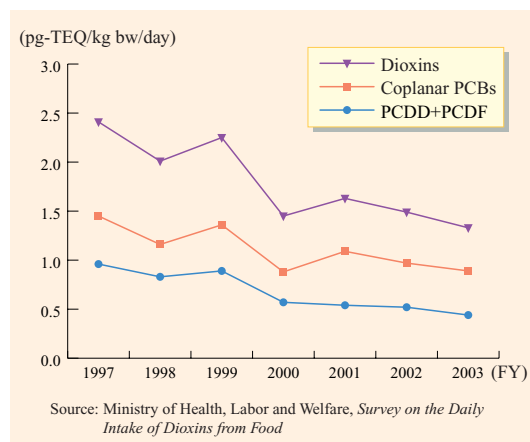
1. The number of dumping cases and the amount of dumping are derived by counting cases in which, from among the illegal dumping of industrial waste identified by prefectures and cities with public health offices, the amount of dumping is 10 tons or more. (Cases that involve specially controlled industrial waste are all included.)
2. For cases identified in the transboundary area between Aomori and Iwate prefectures, the totaled 16,000 tons are included in the FY 1999 data. The remaining 860,000 tons, identified during FY 2002 and FY 2003, were not included in the respective fiscal years. The case in Teshima, Kagawa Prefecture (510,000 tons) was identified in FY 1990, and therefore was not within the scope of the above Figure 2.
3. The amount of waste in the case in Gifu Prefecture was in fact 753,000 tons, as was determined by later studies conducted by Gifu municipal government in March 2005.

Source: Ministry of the Environment, *State of the Illegal Dumping of Industrial Waste, FY 2003*

Changes in Total Emission of Dioxins



Chronological Changes in Daily Intake of Dioxins from Food

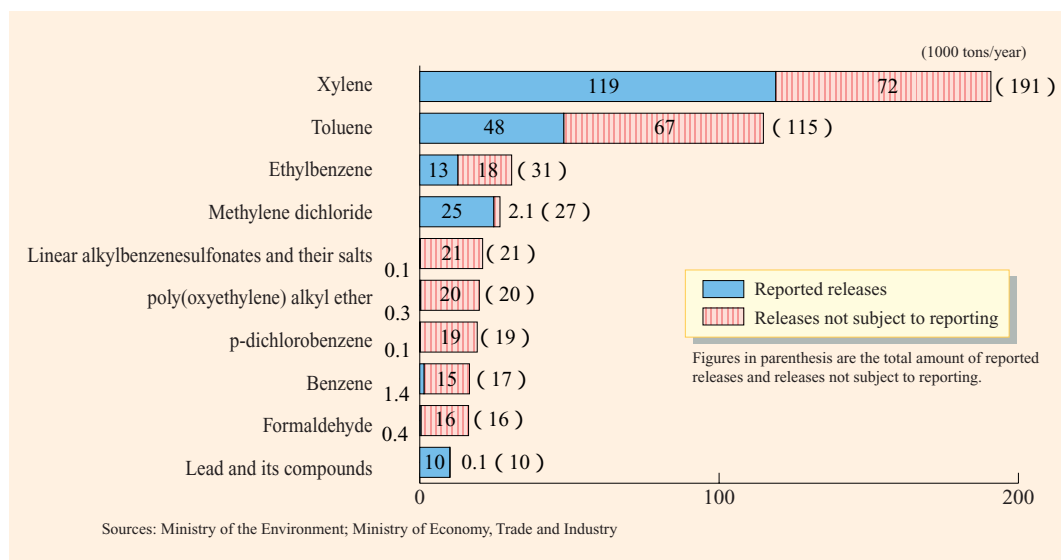


obligatory reporting system for hazard information voluntarily obtained by businesses etc.

The annual emission of dioxins in 2003 was 376 – 404 g-TEQ, an estimated decrease of about 95% compared to 1997, achieving the target for reduction. The average daily intake of dioxin for humans has been decreasing annually and is now less than the tolerable daily intake level (4pg-TEQ/kg bw/day), which is low enough that even if this amount were to be taken throughout one’s lifetime, it would not cause adverse health effects.

To tackle the issue of endocrine disruption, which causes injury and/or hazardous effects on organisms through influence on the endocrine system, the Ministry of the Environment put together a new policy paper in March 2005 entitled “MOE’s Perspectives on Endocrine Disrupting Effects of Substances -ExTEND2005-.”

Top 10 Chemical Substances for Reported Releases and Releases Not Subject to Reporting (FY 2003)



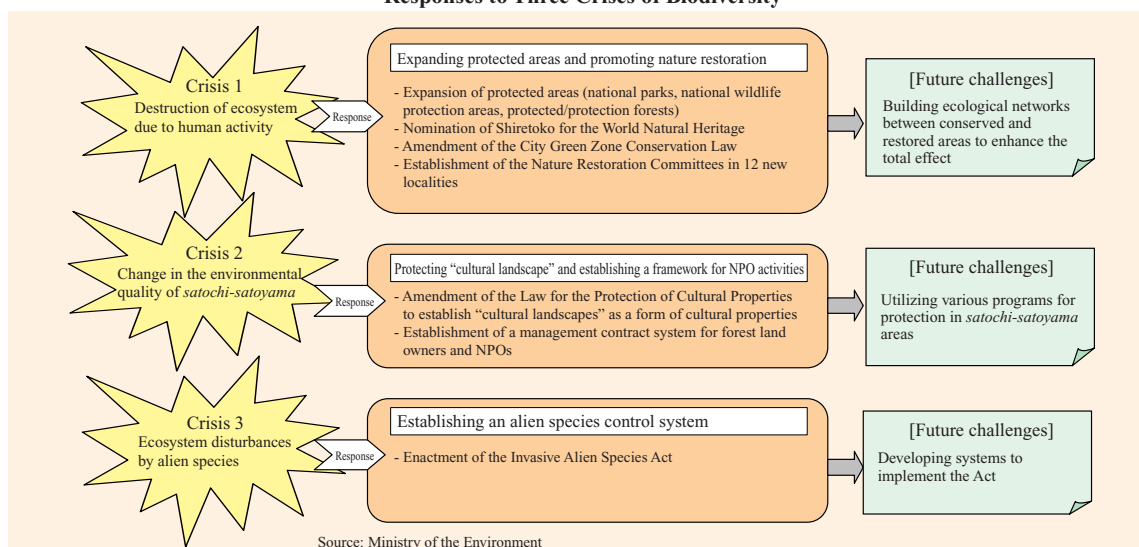
Japan has also adopted the PRTR (Pollutant Release and Transfer Register) system for chemical substances that are suspected of being harmful to human health and to ecosystems. Under the PRTR system, businesses voluntarily identify and report to the government the amount of chemical substances that are released to the environment or transferred as waste materials. The government then aggregates the data from businesses and publishes them with estimated results of release quantities outside notification. The third aggregate result was published in March 2005. It is important to further promote risk communication to enable all parties, including citizens, industries, and the administrations, to share accurate information on chemical substances and to improve communication with each other.

6. Conservation of the Natural Environment and Promoting Contact with Nature

(1) Conservation of the Natural Environment and Promoting Contact with Nature

Pursuant to the new National Biodiversity Strategy in which all ministries work together to realize “a society in harmony with its natural environment,” the second review on its implementations was carried out in FY 2004. The result indicates a need to enhance efforts to disseminate the National Biodiversity Strategy and to set up measures to respond to increasing community activities for conserving the natural environment. These measures include creating a system to involve experts and nurturing human resources.

Responses to Three Crises of Biodiversity



The Red List provides the status of threatened wildlife species. Facing extinction, it reports, are a little more than 20% of mammals, amphibians, brackish water and freshwater fishes, and vascular plants (tracheophyte), a little less than 20% of reptiles, and a little more than 10% of bird species inhabiting Japan. Furthermore, 73 species have been designated as national endangered species of wild fauna and flora pursuant to the Law for the Conservation of Endangered Species of Wild Fauna and Flora, including four species of mammals and 39 species of birds.

A variety of measures are being taken to help conserve biological diversity in Japan.

To protect and increase the use of natural parks properly, Japan is conducting an overall review of park areas and park plans to meet changes in social and other conditions surrounding parks.

To promote the conservation of internationally important wetlands, Japan announced that it would aim at increasing its Ramsar sites to at least 22 by the 9th Meeting of the Conference of the Contracting Parties to the Ramsar Convention to be held in November 2005, and conducted scientific review on priority sites for such designation.

Under the Law for the Promotion of Nature Restoration, 12 new Nature Restoration Committees had been established as of January 2005, initiating efforts toward nature restoration.

The Invasive Alien Species Act was promulgated in June 2004 and entered into effect on June 1, 2005. The objectives of this act are to regulate various actions such as importing and raising invasive alien species (IAS) in addition to controlling IAS that already exist in Japan, thus preventing damages to ecosystem, human safety, agriculture, forestry and fisheries in Japan caused by IAS. Laying down the basic measures in support of damage prevention, the Basic Policy for Preventing Adverse Effects on Ecosystems Caused by Invasive Alien Species was established in October 2004. The basic policy is now being translated into specific measures; for example, 32 species, 4 genera, and 1 family of introduced organisms have been designated as IAS.

In addition, an emphasis is also being placed on people’s contact with nature. It is considered that nature helps develop a healthy mind, revitalize humanity, and learn more about coexistence with nature.

Threatened Wildlife of Japan (Species Listed in the Red List and the Red Data Book)

(as of March 2005)

	Taxonomical group	Species assessed (a)	Extinct	Extinct in the wild	Threatened species		Near threatened	Data deficient	Threatened local population	Number of threatened species (b)	b/a (approx.)
					Critically endangered + Endangered Category IA ; Category IB	Vulnerable					
Animals	Mammals	approx. 200	4	0	32 12 ; 20	16	16	9	12	48	24%
	Birds	approx. 700	13	1	42 17 ; 25	47	16	15	2	89	13%
	Reptiles	97	0	0	7 2 ; 5	11	9	1	2	18	19%
	Amphibians	64	0	0	5 1 ; 4	9	5	0	4	14	22%
	Brackish water and freshwater fish	approx. 300	3	0	58 29 ; 29	18	12	5	14	76	25%
	Insects	approx. 30,000	2	0	63	76	161	88	3	139	0.5%
	Land/freshwater molluscs	approx. 1,000	25	0	86	165	206	69	5	251	25%
	Spiders/crustaceans	approx. 4,200	0	1	10	23	31	36	0	33	0.8%
Subtotal for animals			47	2	303	365	456	223	42	668	
Plants	Vascular plants	approx. 7,000	20	5	1,044 564 ; 480	621	145	52	0	1,665	24%
	Bryophytes	approx. 1,800	0	0	110	70	4	54	0	180	10%
	Algae	approx. 5,500	5	1	35	6	24	0	0	41	0.7%
	Lichen	approx. 1,000	3	0	22	23	17	17	0	45	5%
	Fungi	approx. 16,500	27	1	53	10	0	0	0	63	0.4%
Subtotal for plants			55	7	1,264	730	190	123	0	1,994	
Total			102	9	1,567	1,095	646	346	42	2,662	

- (1) Data on the assessed animal species (including subspecies) were derived from the Environment Agency, *Checklist of Japanese Species of Wildlife* 1993, 1995, and 1998.
- (2) Data on the vascular plants (including subspecies) were gathered by the Japanese Society for Plants Systematics.
- (3) Data on the species of bryophytes, algae, lichen, and fungi (including subspecies) were derived from Ministry of the Environment surveys.
- (4) Data on the current state of threatened species (including subspecies) were derived from the Environment Agency, *Revised Red Data Book—Threatened Wildlife of Japan: Amphibians, Reptiles, Plants I, and Plants II* (2000), *Mammals and Birds* (2002); Ministry of the Environment, *Revised Red Data Book—Threatened Wildlife of Japan: Brackish Water and Freshwater Fish* (2003), *Land and Freshwater Mollusks* (2005); and the Environment Agency, *Red List on Invertebrates* (2000).
- The categories are considered as follows:
 Extinct: Species that are extinct in Japan
 Extinct in the wild: Species that are known only to survive in captivity or in cultivation
 Critically endangered + Endangered: Species in danger of extinction
 Vulnerable: Species facing increasing danger of extinction
 Near threatened: Species with weak foundation for survival
 Threatened local population: Population of a species that is isolated in an area and has high possibility of extinction.
- Source: Ministry of the Environment

List of Invasive Alien Species under the Invasive Alien Species Act

(as of June 1, 2005)

Class	Name of Species
Mammals	Taiwan macaque, crab-eating macaque, rhesus macaque, raccoon, crab-eating raccoon, Javan mongoose, Pallas's squirrel (including Taiwan squirrel), gray squirrel, coypu or nutria, brushtail possum, Reeves's muntjac
Birds	Laughing thrushes, masked laughingthrush, white-browed laughingthrush, red-billed mesia
Reptiles	Snapping turtle, green anole, brown anole, brown tree snake, Taiwan beauty snake, Taiwan pit vipers
Amphibians	Cane toad
Fish	Largemouth bass, smallmouth bass, bluegill, channel catfish
Insects	Red imported fire ant, fire ant, Argentine ant or tropical fire ant
Invertebrates	4 species of widow spiders, 3 species of the genus <i>Loxosceles</i> , any species of the genera <i>Atrax</i> and <i>Hadronyche</i> (family <i>Hexathelidae</i>), any species of the family <i>Buthidae</i>
Plants	Alligatorweed, floating marshpennywort or pennywort, Senegal tea plant

Source: Ministry of the Environment

To promote ecotourism, the Ecotourism Promotion Committee formulated a package of promotion measures in June, 2004. It includes the adoption of the Ecotourism Charter and implementation of model projects.

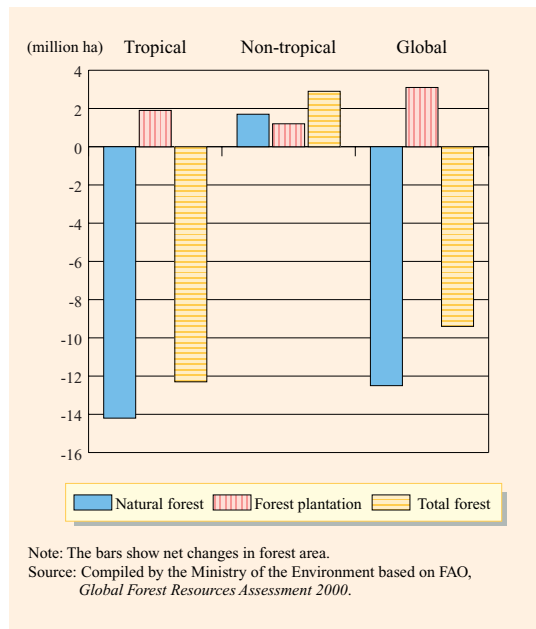
As a response to the urgent issue that needs to be addressed, specifically the state of mineral content displays by hot spring business operators, the enforcement regulation for the Hot Spring Law was revised in February 2005. It aims at improving the provision of information to hot spring users. Under the new regulation, items that may influence hot spring properties must be indicated, in addition to existing description items.

(2) Conservation of Natural Environment Outside Japan

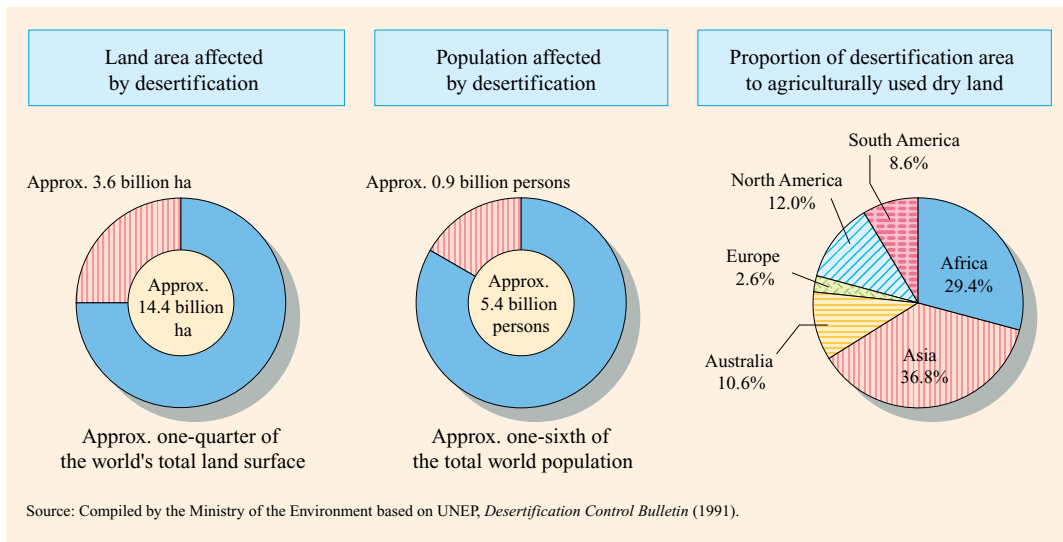
Forests in the world decreased at a rate of about 9.4 million hectares per year averagely from 1990 to 2000. It was mainly attributed to the conversion of forests to farmland, forest fire, and illegal logging. Therefore, efforts for the sustainable forest management in Asia are being promoted under Asia Forest Partnership (AFP), which was set up in 2002, and other initiatives.

About one-quarter of all land areas in the world and 900 million people, accounting for one-sixth of the world's population, are affected by desertification, which is defined as land degradation in arid and semi-arid areas etc. As background of this problem, there are factors such as poverty and population growth in developing countries. Therefore, international efforts are being made under the UN Convention to Combat Desertification (UNCCD).

Annual Forest Area Changes in the World (1990 - 2000)



Current State of Desertification



○ Environmental Conservation Measures to be Implemented in FY 2005

The *Quality of the Environment in Japan 2005* (White Paper) reports the environmental conservation policies and measures to be implemented in FY 2005 in line with the Basic Environment Plan in chapters as follows:

- Chapter One: Conservation of the Global Atmospheric Environment
- Chapter Two: Conservation of the Atmospheric Environment (not including the global atmospheric environment)
- Chapter Three: Conservation of the Water, Soil, and Ground Environments
- Chapter Four: Measures and Policies related to the Material Cycle, including Waste and Recycling Measures
- Chapter Five: Measures for Chemical Substances
- Chapter Six: Conservation of the Natural Environment and Promoting Contact with Nature
- Chapter Seven: Basis of Various Measures, and Measures Facilitating the Participation of Various Actors and International Cooperation



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● If you have any opinions and comments regarding this booklet, please contact the following:

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