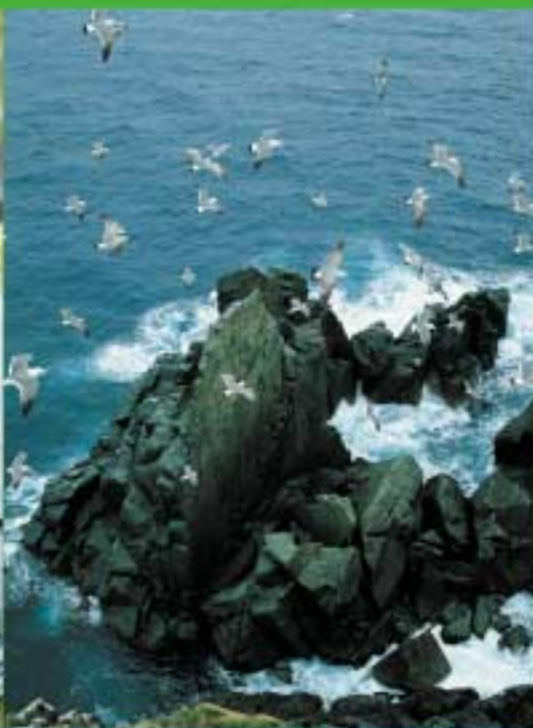


ECOREA

Environmental Review 2007, Korea



MINISTRY OF ENVIRONMENT
REPUBLIC OF KOREA



ECOREA

Environmental Review 2007, KOREA

Ministry of Environment

ECOREA is a compound of the prefix "ECO", which suggests an ecologically sound and comfortable environment, and the name of our nation, "KOREA".

"Preservation of the environment improves the quality of life while the environment industry creates new engines of growth.

Climate change is threatening our very future. Natural disasters and abnormal weather patterns are on the rise and the damage caused by them is becoming more serious. We must actively take part in reducing carbon emissions.

In the short term, our economy may undergo a period of difficulty while adjusting to these changes. But, we must endure. We must creatively adapt.

The various issues that affect our state policy-such as food, environment, water, natural resources, energy-must undergo an overall paradigm shift so that they become more eco-friendly."

from the inauguration speech of President Lee Myung-Bak

'08. 2. 25

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The Minister's Message



The environment has become a key issue in the 21st century. Our ability to achieve 'Environmental Sustainability', a state in which environmental conservation, economic growth and social cohesion are balanced, will determine our national and corporate competitiveness as well as the quality of our individual lives.

In response to this issue, the international community has been recognizing the importance of environmental conservation, and has been implementing new environmental policies to address environmental issues such as global warming.

In 2008, which marks the first year of the new administration, the Ministry of Environment will make an all-out effort to live up to public expectations in this new era, and establish a new framework for environmental policy based on a clear-eyed evaluation both of our past achievements, and of the limitations of our previous environmental policies.

First of all, the Ministry will play a leading role in establishing a nation-wide system to address climate change. We will proactively deal with post-Kyoto negotiations by stepping up domestic efforts to protect the environment, such as setting national objectives for the reduction of greenhouse gas emissions, and introducing measures to adapt to climate change.

Second, the Ministry will work to protect public health by addressing environmental diseases such as atopy, asthma, and Sick Building Syndrome, and will establish a strong national system to manage environmentally harmful factors.

Third, the Ministry will break away from the widely-held perception that there must be a trade-off relationship between economic growth and environmental protection, and will nurture domestic environmental technology and industry as a new growth

engine for the national economy, to achieve economic growth together with environmental conservation.

Fourth, the Ministry will actively meet the growing public demand for a cleaner environment by providing clean and safe drinking water, creating ecologically-friendly spaces where nature and humanity can coexist, and establishing a culture of resources-recycling.

Our experiences in implementing environmental policies to achieve the ideal of "sustainable development" are introduced in this brochure, ECOREA. ECOREA is the new name for GREEN KOREA, which has been published annually since 1999, and is a compound of the prefix "ECO", which suggests an ecologically sound and comfortable environment, and the name of our nation, "KOREA".

This brochure includes our action plans for 2008, a report on the environmental status of each sector including air and water quality, and our achievements in terms of environmental policy, as well as information on the organization and budget, and the relevant laws and regulations of the Ministry of Environment, which could be of helpful information for other countries preparing similar policies.

It is my hope that this brochure, "ECOREA - Environmental Review 2007, Korea", will serve to share Korea's experiences with other countries around the world, and through this promote the exchange of information on environmental policies, ultimately contributing to international efforts to address environmental issues.

Thank you.

April 2008



MAANEE LEE
Minister of Environment

Overview of Korea

Republic of Korea in Figures

Area :	99,678.12 km ² (2006)
Population :	48,456,369(2007 Population estimated in Nov 2006, male 24,344,276, female 24,112,093)
Capital :	Seoul
Government Type:	Repubic
Religion :	No affiliation 46.48%, Buddhist 22.8%, Christian 18.32%, Catholic 10.94%, Confucianist 0.22%, Other 1.24%(2005)
National Assembly :	Unicameral National Assemble or Kukhoe(299 seats-members elected for four-year terms; 243 in single-seat constituencies, 56 by proportional representation)
Administrative Divisions :	9 provinces(do, singular and plural) and 7 metropolitan cities (gwangyoksi, singular and plural)
GNI per capita :	\$18,372(2006)
GNI(Unit: billion dollars) :	\$887.3(2006)
Currency :	South Korean Won (KRW)
Climate :	Four seasons, temperate, with rainfall heavier in summer than winter

- Source : Korea National Statistical Office

Map of Korea



- source : www.korea.net

Institutional Mechanisms



- Administrative Organizations
 - Environmental Acts
 - Budget & Finance
- 

Institutional Mechanisms

Administrative Organizations

Roles and Responsibilities in the Environmental Administration

The Ministry of Environment

The Ministry of Environment takes responsibility for environmental conservation and has twelve subsidiary organizations including National Environmental Dispute Resolution Commission, National Institute of Environmental Research (NIER), National Institute of Biological Resources and National Institute of Environmental Human Resources Development, and eight local environmental offices. There are six public organizations under MOE including the Environmental Management Corporation (EMC), Korean Environment & Resources Corporation (ENVICO), National Parks Authority, Sudokwon Landfill Site Management Corporation (SLC), Korea Eco-Products Institute, and Korea Institute of Environmental Science and Technology. For in-depth research on environmental policy, policy development, as well as for review of environmental impact assessment reports, the Korean Environment Institute was established under the umbrella of the Office of the Prime Minister.

- The Main Office

The Ministry of Environment that is in charge of developing comprehensive environmental policies, consists of 2 Policy Offices (Planning and Coordination Office, Environmental strategy office), 3 Bureaus (Water

Environment Management Bureau, Nature Conservation Bureau, Resource Recirculation Bureau), 6 Offices (office of Spokesperson, office of the Inspector General, Policy Planning Office, Climate & Air Quality management Office, International Cooperation Office, Water Supply and Sewerage Policy Office), 38 Divisions, and 3 teams.

The major responsibilities of the Ministry include: firstly, the establishment of a framework for environmental administration through the enactment and amendment of environmental Acts and the introduction of environmental institutions; secondly, the development and implementation of the mid- to long-term comprehensive measures for environmental conservation; thirdly, setting regulatory standards; fourthly, administrative and financial support for local environmental offices and municipalities to promote environmental management; and last but not least, international cooperation in environmental conservation.

- The National Environmental Dispute Resolution Commission (NEDRC)

Under the article 4 of the Environmental Dispute Adjustment Act, the National Environmental Dispute Resolution Commission was established to settle dis-

putes over damage caused by environmental pollution.

This Commission is placed in the Ministry of Environment, and the regional Environmental Dispute Resolution Commissions at Seoul City, metropolitan cities and provinces. The NEDRC consists of the Chairperson, eight non-standing members, as well as the secretariat that coordinates and assists activities for dispute resolution.

- The National Institute of Environmental Research (NIER)

To conduct research, tests and assessment of environmental conservation and pollution prevention, the National Environmental Protection Institute (NEPI) was established as a specialized research institute under the Ministry of Health and Social Affairs, separated from Korea National Institute of Health in July 1978.

NEPI was incorporated in the newly established Environment Administration in 1980. Aiming to become a performance-centered research institute, NEPI was reorganized and renamed the National Institute of Environmental Research (NIER) on July 22, 2005.

The major activities of NIER include the survey of and technical development for environmental conserva-

tion, as well as the research necessary for the formation of environmental policies by the Ministry of Environment including the development of environmental standards.

- National Institute of Biological Resources

This Institute was launched in February 2007 as a specialized research institute in conserving biological resources, to conduct research and the study of effective conservation and use of national biological resources and promote / exhibit important resources.

- The National Institute of Environmental Human Resources Development (NIEHRD)

This Institute was launched as a specialized institute in environmental education, separated from NIER in December 2006, in order to educate and train public officers and citizens involved in the environment sector.

- Local Environmental Offices

There are four River Basin Environmental Offices (Han, Nakdong, Geum, and Yeongsan) to manage major watersheds, three Regional Environmental Offices (Wonju, Daegu, Jeonju) and eight local branch offices (Busan, Ulsan, Gumi, Pohang, Cheongju, Yeosu,

Kyeongin, Chuncheon). The Metropolitan Air Quality Management Office was built to improve air quality, especially in metropolitan areas.

Local environmental offices are responsible for the development and implementation of regional environmental management plans; consultation on the Prior Environmental Review System (PERS) and Environmental Impact Assessment(EIA); conservation of the natural environment and ecosystems; inspection of pollution sources and the measurement and analysis of environmental pollution; fostering and support for the environment-related industry; control over both businesses which emit designated waste and waste treatment companies; guidance and supervision on the operation of environmental infrastructure; and the imposition of waste deposit and charges.

In addition to the aforementioned tasks, four River Basin Environmental Offices are in charge of operating the watershed management committee, using/allocating watershed management funds, review and approval of water quality improvement projects by region; approval and assessment of the Total Maximum Daily Load Management System (TMDL); and imposing water use charges on tap water businesses. The Metropolitan Air Quality Management Office is responsible for preventive air quality management under the Special Act on Metropolitan Air Quality Improvement.

Relevant Central Administrative Organizations

As environmental affairs are so diverse, complex, and

wide-ranging, the Ministry of Environment has cooperated with other governmental bodies including eight Ministries.

The Korea Forest Service is in charge of forests which take a large share of the land and are home to a diversity of plants, animals, and microorganisms. The Ministry of Land, Transportation and Maritime Affairs is responsible for water quantity management, river/stream management, marine environmental management and transportation policies which are closely related to air quality, as well as land use plans that are directly linked with the environment. The Ministry of Knowledge Economy is in charge of energy supply/demand policy which is relevant to air pollution and of policies for control over businesses which emit pollutants.

Municipalities

Environmental affairs are divided between central and local governments. In other words, the Ministry of Environment develops a framework for environmental policies including the enactment of environmental Acts and setting regulatory standards.

The responsibilities for implementation are shared by local environmental offices and municipalities.

Major tasks of municipalities are divided into two categories: one category consists of their own environmental affairs - the development and implementation of regional environmental conservation policies within the administrative jurisdiction, the collection and

treatment of municipal waste, and the treatment of sewerage and livestock waste; and the other category consists of matters authorized by the Minister of Environment, such as control and management of pollutant-emitting companies in and around industrial complexes and the imposition of environmental improvement charges.

Organizations involved in environmental administration within local governments are different in terms of their types and roles. 16 metropolitan cities set up an environmental green area bureau and an environmental affairs bureau. Municipalities (cities, towns, villages) set up an Environmental Protection Division and an Environmental Management Division to take charge of environmental affairs.



Environmental Acts

Current Status of Environmental Acts

[Table 1] History & Current Status

1960 (6 Acts)	1970~1980 (9 Acts)	1990 ~ 2007 (45 Acts)		
		Current Status	Enacted Date	Revised Date
Environmental Pollution Prevention Act (enacted on Nov. 5, 1963)	Environmental Conservation Act (enacted on Dec. 31, 1977)	Framework Act on Environmental Policy	Aug. 1, 1990	May 17, 2007
		Clean Air Conservation Act	Aug. 1, 1990	Apr. 27, 2007
		Framework Act on Sustainable Development	Aug. 3, 2007	Feb. 4, 2008 (Effective Date)
		Indoor Air Quality Management Act	Dec. 30, 1996	Dec. 30, 2006
		Noise & Vibration Control Act	Aug. 1, 1990	Apr. 11, 2007
		Foul Odor Prevention Act	Feb. 9, 2004	Jan. 3, 2007
		Special Act on Metropolitan Air Quality Improvement	Dec. 31, 2003	Jan. 26, 2007
		Water Quality Conservation Act	Aug. 1, 1990	May 17, 2007
		Act Relating to the Han River Water Quality Improvement & Community Support	Feb. 8, 1999	Jan. 16, 2001
		Act on the Nakdong River Watershed Management & Community Support	Jan. 14, 2002	Jan. 14, 2002
		Act on the Geum River Watershed Management & Community Support	Jan. 14, 2002	Jan. 14, 2002
		Act on the Yeongsan & Sumjin River Watershed Management & Community Support	Jan. 14, 2002	Jan. 14, 2002
		Natural Environment Conservation Act	Dec. 31, 1991	May 17, 2007
		Act on Special Measures for the Control of Environmental Offenses	May 31, 1991	Dec. 31, 1999
		Environmental Dispute Adjustment Act	Aug. 1, 1990	May 11, 2007
		Act on Antarctic Activities and Environmental Protection (jointly enacted)	Mar. 22, 2004	Mar. 22, 2004
		Act on Promotion of the Purchase of Environment-Friendly Products	Dec. 31, 2004	Sept. 27, 2006
		Act on Environmental Test and Examination	Oct. 4, 2006	Oct. 5, 2007 (Effective Date)
		Environment Improvement Expenses Liability Act	Dec. 31, 1991	Jan. 3, 2007
		Natural Park Act	Natural Park Act	Natural Park Act
Special Act on the Ecosystem Conservation of Small Islands such as Dokdo Island	Dec. 31, 1997			May 17, 2007
Wetland Conservation Act (jointly enacted)	Feb. 8, 1999			Apr. 11, 2007
Act on the Assessment of Impacts of Works on Environment, Traffic, Disasters, etc. (jointly enacted)	Dec. 31, 1999			May 17, 2007
Soil Environment Conservation Act	Jan. 5, 1995			May 17, 2007
Act on the Protection of the Baekdu Daegan Mountain System (jointly enacted)	Dec. 31, 2003			Jul. 13, 2007
National Trust Act on Cultural Heritage & Natural Environment Assets (jointly enacted)	Mar. 24, 2006	Mar. 25, 2007 (Effective Date)		

1960 (6 Acts)	1970~1980 (9 Acts)	1990 ~ 2007 (45 Acts)		
		Current Status	Enacted Date	Revised Date
Act Relating to the Protection of Birds, Mammals & Hunting (enacted on Mar. 30, 1967)		Wildlife Protection Act	Feb. 9, 2004	May 17, 2007
	Environmental Pollution Prevention Corporation Act (enacted May 1, 1983)	Environmental Management Corporation Act	May 21, 1983	Jan. 3, 2007
		Act Relating to Special Accounting for Environmental Improvement	Jan. 5, 1994	Dec. 30, 2006
		Development of & Support for Environmental Technology Act	Dec. 22, 1994	Jan. 3, 2007
Act Relating to Toxic & Hazardous Substances (enacted on Dec. 13, 1963)		Toxic Chemicals Control Act	Jan. 5, 1994	Dec. 31, 2004
		Persistent Organic Pollutants (POPs) Control Act	Jan. 26, 2007	Jan. 27, 2008 (Effective Date)
Waste Cleaning Act (enacted on Dec. 30, 1961)	Waste Control Act	Waste Control Act	Dec. 31, 1986	Apr. 11, 2007
		Act on the Disposal of Sewage, Excreta & Livestock Wastewater (annulled on Sep. 28, 2007)	Mar. 8, 1991	
		Act on the Management and Use of Livestock Manure (jointly enacted)	Sep. 27, 2006	Sep. 28, 2007 (Effective Date)
		Act on the Promotion of Saving and Recycling of Resources	Dec. 8, 1992	May 11, 2007
		Act on Resource Recycling of Electrical and Electronic Equipment and Vehicles (jointly enacted)	Apr. 27, 2007	Jan. 1, 2008 (Effective Date)
		Act on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal	Dec. 8, 1992	May 17, 2007
		Act on the Promotion of Construction Waste Recycling	Dec. 31, 2003	Dec. 28, 2006
		Promotion of Installation of Waste Disposal Facilities and Assistance, etc. to Adjacent Areas Act	Jan. 5, 1995	Jan. 3, 2007
	Sudokwon Landfill Site Management Corporation Act	Jan. 21, 2000	Jan. 21, 2000	
	Compound Waste Treatment Corporation Act (enacted on Dec. 28, 1979)	Korea Environment & Resources Corporation Act	Dec. 27, 1993	Dec. 30, 2003
Sewerage Act		Sewerage Act	Aug. 3, 1966	Sept. 27, 2006
Water Supply & Waterworks Installation Act		Water Supply & Waterworks Installation Act	Dec. 31, 1961	Apr. 11, 2007
		Drinking Water Management Act	Jan. 5, 1995	Apr. 11, 2005

The Enactment and Amendment of Environmental Acts in 2007

In the first half of 2007, 28 Acts were enacted and/or revised including three newly-enacted major Acts - the "Act on Persistent Organic Pollutants (POPs) Management" which was enacted in January 2007, to establish a comprehensive framework for the management of persistent organic pollutants such as dioxin; the "Act for Resource Recycling of Electrical / Electronic Products and Automobiles"; and the "Sustainable Development Act" which aims to establish an institutional basis for sustainable development in central and local regions and to implement relevant international agreements.

Additionally 12 Acts are being or will be enacted and/or amended in line with the 2007 legislation plan, including the "Act on Environmental Health", the "Act on the Assessment of the Impact of Works on the Environment, Traffic, Disasters, etc.," and the "Clean Air Conservation Act."

The Clean Air Conservation Act

Flaws in the implementation of this Act were detected and fixed. For instance, if air quality in a city or province was below a certain standard, it would be designated as part of the "air quality control region" and if the air quality were to improve to meet the standard, a mayor or provincial governor could request the Minister of Environment to cancel the designation and should submit their action plan for air quality improvement to the Minister.

In addition, a foundation was built to develop comprehensive measures for prevention and control of Dust and Sandstorms (DSS) and establish a task force to address DSS.

The Water Supply & Waterworks Installation Act

An article which stipulates the imposition of charges on a person for causing damage to waterworks was removed and incorporated into the article of the Polluter Pays Principle. This article prescribes that those who cause an additional cost to waterworks installation should take responsibility for all or part of the costs they created.

The Water Quality Conservation Act

An article on the imposition of charges on waste treatment facilities to prevent environmental pollution, prescribed in the Environmental Improvement Expenses Liability Act, was transferred and reflected in the Water Quality Conservation Act. This Act was renamed to the "Act on Water Quality and Aquatic Ecosystem Conservation." The newly renamed Act contains a legal basis and procedures for the implementation of the Total Maximum Daily Load Management System (TMDL) in watersheds except for four major rivers; and an institutional basis for research on water quality and aquatic ecosystems, and recommendations for water quality improvement and aquatic ecosystem conservation, as well as for restrictions on activities around polluted public water areas.

The Foul Odor Prevention Act

Flaws in the implementation of this Act were fixed as follows: the comprehensive measure for odor prevention shall be re-formulated and implemented every ten years; the standard for the designation of odor control regions, prescribed in enforcement regulations, was transferred to this Act; and the standard

was more relaxed than before.

The Natural Park Act

Additional articles contain as follows: natural park conservation and management plans which had been separately implemented shall be unified into an integrated plan for the conservation and management of natural parks; ecological characteristics (e.g., ecological axes) shall be considered first when building roads or railroads within natural parks; the right to order the removal of abandoned waste within natural parks shall be granted to park rangers; and the right to investigate those who are responsible for said waste shall be granted to staff members.

The Act on the Promotion of Saving and Recycling of Resources

Three amendments of this Act include the followings: articles were created to define biodegradable polymers; to stipulate the standard for phase-in reduction of plastic packaging materials; and to exempt waste fees. In addition, the use of profits from the sale of disposable shopping bags was stipulated; some provisions were more specific and detailed, regarding quality certification for solid fuel, certificate authority, post-quality management of certified solid fuel and matters entrusted to the lower-level regulations.

The Waste Control Act

Infectious waste from clinics and medical centers was renamed medical waste and a strong control over clinical waste with a potential infection risk was stipulated as well. In furtherance to this, the existing paper-based waste manifest system was changed into an electronic data system. Waste excluding hazardous waste under the Basel Convention shall be declared when being imported and exported. Moreover, the

standard for administrative disposition was clarified for greater transparency in discretion.

The Promotion of Installation of Waste Disposal Facilities and Assistance, etc. to Adjacent Areas Act

Defects and irrationalities in the operation of the existing institutions under this Act were corrected as follows: the Chairperson of the Sudokwon Landfill Site Management Corporation was included in the existing institutions involved in the establishment of waste treatment facilities, so as to take legal responsibility for community support, involved in the designation of lots for waste treatment facilities, and improve the process of the decision and notification of the regions under the environmental impact by aforementioned facilities.

The Development of and Support for Environmental Technology Act

Defects and irrationalities in the operation of the current institutions under this Act were corrected by developing a legal basis for the collection and use of technical license fees, providing national property free of charge to the Korea Institute of Environmental Science and Technology, extending the validity period of new environmental technologies, canceling the designation of an environmental technology development center, as well as, the period of designation and re-designation of environmentally friendly companies.

The Special Act on Metropolitan Air Quality Improvement

A legal basis was established for the introduction of irregular inspection on emission reduction devices before being attached to vehicles and for a defect confirmation inspection on those after being

attached. The management of emission reduction devices was reinforced through mandatory operation of vehicles equipped with the aforementioned device or a low emission engine beginning from a designated time (e.g., a warranty period).

The Wetland Conservation Act

This Act was amended to launch the National Wetland Committee in order to establish a close cooperation network for wetland conservation and management among administrative organizations and wetland experts and for coordination of wetland policies among government bodies; as well as to add an exception for activity restrictions in wetland conservation areas in an effort to efficiently achieve the two goals of wetland conservation and military security.

Persistent Organic Pollutants (POPs) Control Act

An institutional basis was established to implement the Stockholm Convention on Persistent Organic Pollutants (POPs), an international effort for POP reduction and elimination, which had come into effect on May 17, 2004. The Act contains provisions regarding the standard for POP emission, restrictions on manufacturing, import/export and use of POPs, the monitoring and control of facilities which emit POPs, the treatment of POP waste, the management of POP devices, and support for the establishment of POP emission reduction facilities, and international cooperation in POP management.

The Act on Resource Recycling of Electrical and Electronic Equipment and Vehicles.

This Act aims to promote recycling of electrical/electronic equipment and motor vehicles, restrict the use of hazardous substances so as to make recycling easier, as well as to encourage manufacturers and

importers to provide information on recycling of the aforementioned products and collect and recycle used products. The appropriate reuse and recycling of electrical/electronic waste and abandoned vehicles is laying a cornerstone for the establishment of an efficient resource recycling system, and thereby protecting the national environment, and actively responding to international environmental regulations which are getting stronger.

The Environmental Dispute Adjustment Act

The provision was removed that stipulated a member of the NEDSC elected at a by-election shall hold office for the remainder of the term of the member whose position on the Commission was vacated.

The requirements for a member of the NEDSC have been relaxed and revised so that they do not necessarily include such groups as associate professors with environment-related experience. The provision regarding the right to impose fines that was given only to the Minister of Environment was amended to grant the right to mayors and governors of each province.

The Special Act on the Ecosystem Conservation of Small Islands such as Dokdo Island

To designate and manage specific islands in more systematic ways, new provisions were added to this Act, relating to joint research and the designation of an honorary supervisor. An article of land purchase was amended to buy land within specific islands through a negotiation process. Provisions regarding transparency in discretion were specific and detailed as well.

The Wildlife Protection Act

The Act clarified reasons for permit cancellation of

imports and exports of international endangered species, so as to enhance administrative transparency and predictability; bans the import of alien wildlife species that disturb ecosystems to protect domestic ecosystems; and contains a legal basis for a Korea wildlife protection and management council.

The Natural Environment Conservation Act

Ecosystem conservation charges shall be imposed on development projects (more than 30,000 m²) subject to PERS (Prior Environmental Review System). If a person who did not pay the charge conducts a conservation project with the consent of a person who paid, the payer shall get refunded according to an executive order.

The Framework Act on Environmental Policy

An article regarding development projects subject to PERS, prescribes that a construction permit from the chief of municipalities shall not be granted until pre-environmental review negotiations are completed.

In reality, however, there have been increasing cases of non-compliance with this regulation. Therefore, penalties were introduced and given to construction companies for work begun in advance of the completion of pre-environmental review negotiations.

The Act Relating to the Han River Water Quality Improvement & Community Support

Three measures for the management of three major river watersheds were introduced to the Han river area-the promotion of community support in the areas where residents improved water quality through their own efforts; emission reduction responsibility held by those who emit specific pollutants; and ban on the construction of new waste landfill facilities within the vicinity of streams and rivers. Downstream

water users were subject to a water use charge.

Some flaws in the Act were fixed through mandate development of a framework for buffer zones around watersheds and adjustment of the members of the watershed management committee.

Framework Act on Sustainable Development

This Act aims to create an institutional basis for sustainable development in central and local regions and to lay a foundation for making Korea a leading country in sustainable development and implementing international agreements.

The Act contains a legal basis for re-formulating a framework for the sustainable development of central and local regions every 20 years and action plans every five years, as well as for establishing the commission on sustainable development in central and local regions.

[Table 2] Plans for Enactment/Amendment of Environmental Laws in the Second Half of 2007

Acts	Contents
Environmental Health Act (enacted)	<ul style="list-style-type: none"> - Set and manage environmental standards on the basis of an integrated risk assessment - Conduct epidemiological research aiming to prevent and control environmentally-related diseases; and compensate and support illness and injury - Build a basis for environmental health research and financial resources including the Environmental Health Promotion Fund
Act on the Assessment of Impacts of Works on Environment, Traffic, Disasters, etc. (enacted)	<ul style="list-style-type: none"> - Renamed as the "Environmental Impact Assessment Act" (except for traffic, disasters and population) - Mandatory Scoping - the decision on the scope, depth and terms of reference, to be addressed within the Environmental Statement - Introduce a simpler assessment process for a simple negotiation
Environmental Dispute Adjustment Act (partly amended)	<ul style="list-style-type: none"> - Increase the number of NEDRC members from 9 to 15 - The Commission's financial decision has the effect of a court settlement
Toxic Chemicals Control Act (partly amended)	<ul style="list-style-type: none"> - Remove inappropriate clauses including the improvement of a method for confirming an exemption from hazard assessment - Provide specific reasons for suspension or cancellation of certificates of registration or approval for the handling of the toxic chemical substances
Clean Air Conservation Act (partly amended)	<ul style="list-style-type: none"> - Integrate periodical inspection with precision inspection - Contain a method to manage inspection agencies that deal with motor vehicle fuels and additives and for the cancellation of their designation
Special Act on Metropolitan Air Quality Improvement (partly amended)	<ul style="list-style-type: none"> - Adjust the position level of the Chairperson of the Metropolitan Air Quality Management Committee - Specific reasons for cancelling permits on construction and modification of businesses
Act on the Nakdong River Watershed Management and Community Support (partly amended)	<ul style="list-style-type: none"> - Activity restrictions on riparian zones; and a strong management of riparian zones - Develop procedures for land purchase - Increase the number of people in the category who pay water charges
Act on the Geum River Watershed Management & Community Support (partly amended)	<ul style="list-style-type: none"> - Activity restrictions on riparian zones; and a strong management of riparian zones - Execution procedure for land purchase - Increase the number of people in the category who pay water use charges
Act on the Yeongsan & Sumjin River Watershed Management & Community Support (partly amended)	<ul style="list-style-type: none"> - Activity restrictions on riparian zones; and a strong management of riparian zones - Develop procedures for land purchase - An Increase in the number of people in the category who pay water charges
Drinking Water Management Act (partly amended)	<ul style="list-style-type: none"> - Promote equality in taxation on drinking water through the integration of a method of imposing water quality improvement charges on the basis of the amount of water intake - Create penalties for drinking water inspection agencies, criminal activities such as issuing false certificates of water quality inspection results
Act on the Promotion of Saving and Recycling of Resources (partly amended)	<ul style="list-style-type: none"> - Formulate a framework for resource circulation every five years - Support resource circulation assessment of products - Encourage built-in furniture in apartment houses and accommodation facilities
Korea Environment & Resources Corporation Act (partly amended)	<ul style="list-style-type: none"> - Add chemicals-related projects to the foundation goal of the Corporation - Business scope adjustment such as adding projects for waste management and treatment - Create regulations for outsourcing to private companies for facility management

Environment-Related Acts in Governmental Bodies

As shown in Table 3, more than 60 environmental Acts were under the jurisdiction of more than 15 government bodies. For this reason, there are possibilities for loopholes, redundancy, and inconsistency in diverse

environment associated Acts and even conflicts and contradiction among those Acts. To prevent this, close cooperation is needed among government bodies.

[Table 3] Environment-Related Acts of Governmental Bodies

Category	Acts
Air Pollution	Road Traffic Act, Atomic Energy Act, Nuclear Liability Act, Petroleum Business Act, Energy Use Rationalization Act, Construction Machinery Management Act, Integrated Energy Supply Act, Alternative Energy Development Promotion Act, Act on the Control, etc. of Manufacture of Specific Substances for the Protection of the Ozone Layer
Water Pollution	Prevention of Marine Pollution Act, Groundwater Act, River Act, Public Waters Reclamation Act, Aggregate Picking Act, Public Waters Management Act, Aggregate Picking Act, Act on Construction of Dams and Assistance, etc. to their Environment, Small River Maintenance Act
Noise	Road Traffic Act, School Health Act, Assembly and Demonstration Act
General	Framework Act on National Territory, Act on Planning and Use of National Territory, Building Act, Urban Park Act, Act on Cluster Facilitation and Plant Establishment, Act on Land Purchase and Compensation for Public Projects, Urban Development Act, Industrial Sites and Development Act, Housing Site Development Promotion Act, High Speed Rail Construction Promotion Act, Act on the Promotion of a New Airport for Seoul Metropolitan Area Construction, New Harbor Construction Promotion Act, Special Act on Jeju Free International City, Seoul Metropolitan Area Readjustment Planning Act, International Conference Industry Promotion Act, Special Act on Support for Areas Granted to the US Forces (article 28) Mine Pollution Prevention and Reclamation Act
Agriculture	Agrochemicals Control Act, Special Act on Rural Development, Act on Maintenance and Improvement of Rural and Fishery Areas, Farmland Act, Plant Protection Act, Act on Measures for Disaster Prevention in Rural and Fishery Areas
Livestock	Livestock Industry Act, Dairy Promotion Act, Meadow Land Act
Fisheries & Harbor	Fisheries Act, Fishery Harbor Act, Harbor Act
Forestry	Forestry Act, Erosion Control Act, Forest Management Act
Others	Act on Special Measures for the Deregulation of Corporate of Activities, Protection of Cultural Properties Act, Act on the Promotion of the Conversion into Environment-Friendly Industrial Structure, Mining Safety Act, Tourism Promotion Act, Scientific Technology Promotion Act, Mining Industry Act, Inland-Water Fisheries Act, Countermeasures against Natural Disasters Act, Punishment of Minor Offenses Act, Foreign Trade Act, etc

Budget & Finance

The Current Status of Environmental Finance

Investment in environmental protection has increased over the past five years from 2002 to 2006 by an annual average of 7.1%. The budget has shown an annual average increase of 4.3% and watershed management funds an annual increase of 29.5% on average.

Special accounts for environmental improvement were expanded - an increase of KRW 200 billion com-

pared to the 2006 budget - through the reform of transportation / energy / environmental taxes and an increase in tax revenues. The national budget has so far been mainly allocated to water quality, water supply, and sewerage services. But recently we see the increase in allocation for air quality, nature conservation and environmental health.

[Table 4] Current Status of Sectoral Investment by MOE

(Unit : KRW100Million, %)

Category	2003	2004	2005	2006	2007
Total	14,037 (100)	14,519 (100)	28,557 (100)	29,992 (100)	32,232 (100)
Water Supply	2,433 (17.3)	1,958 (13.5)	2,034 (7.1)	2,255 (7.5)	2,295 (7.1)
Water Quality Improvement	3,366 (23.8)	3,773 (26.0)	16,311 (57.1)	15,675 (52.3)	17,372 (53.9)
Waste Management	3,086 (22.0)	2,867 (19.7)	2,787 (9.8)	2,773 (9.2)	2,771 (8.6)
Air Quality Improvement	856 (6.1)	1,042 (7.2)	1,933 (6.8)	3,249 (10.8)	3,486 (10.8)
Nature Conservation	914 (6.5)	1,102 (7.6)	1,262 (4.4)	1,576 (5.3)	1,992 (6.2)
General Environmental Protection Activities ¹⁾	1,813 (12.9)	2,068 (14.2)	2,243 (7.9)	2,167 (7.2)	3,131 (9.7)
Others	1,569 (11.4)	1,709 (11.8)	1,987 (6.9)	2,297 (7.7)	1,185 (3.7)

Note. 1) General Environmental Protection Activities : categorized and managed as "environmental technology research" by 2005

※ Environmental technology research : Development of next-generation environmental core technologies, environmental improvement funds, environmental research/surveys, and promotion of international cooperation

Financial Prospect in the Environmental Sector

A survey indicates that the effect of increasing environmental investment on real environmental improvement fell short of our expectations. The reason is that growing demand for the improvement of the quality of life has dramatically raised the public interest in a sound and comfortable environment. Another reason is that the public shows greater interest in not only the natural surroundings but also the living environment, as environmental diseases, including atopy and asthma, have increased.

To provide the environmental services that the public needs, the Ministry will drive forward strategic budget allocation for social class, generations, and regions. In particular, a continued investment in rural/coastal areas and islands which are short of environmental services will help eliminate "environmental polarization." In addition, to improve the quality of life, investment will be increased in the prevention of environmental diseases (e.g., Sick House Syndrome, atopy, and asthma) and the improvement of the living environment.



Current Status of Settlement of Accounts for 2006

[Table 5] The Settlement of Expenditure by Sector in 2006

(Unit : KRW100Million)

Category	Budget Amount	Current Budget Amount	Expenditure	Balance Carried Forward to Next Year	Disuse
Total	29,992	31,564	31,049	362	153
Water Supply/Sewerage Services	15,476	15,974	15,899	63	13
Environmental Policy	1,892	1,918	1,858	39	20
Nature Conservation	1,596	2,188	2,091	82	15
Air Quality Improvement	3,297	3,432	3,318	69	45
Water Quality Improvement	2,491	2,597	2,579	13	6
Waste Management	2,779	2,929	2,906	11	12
International Cooperation	75	69	62	1	6
Institution Operation	1,491	1,524	1,470	39	16
Others (including river basins, etc.)	894	933	867	46	20

Status of the 2007 Environmental Budget

The 2007 budget of the Ministry of Environment has increased by 7.4% to KRW 3.22 trillion, compared to that of 2006 because of an increase in the budget for nature conservation, water quality, water supply and sewerage services.

- Water Supply

The 2007 budget for water supply management has shown a 1% increase of KRW 229.5 billion from KRW 227.3 billion in 2006. That is because projects for local waterworks improvement with a budget of KRW 16.8 billion in 2006 were transferred from a special account for treasury loan to the Public Capital Management Funds (KRW 14.4 billion in 2007).

- Water Quality Improvement

The budget in 2007 for water quality improvement increased by KRW 172.4 billion (11.0%) to KRW 1.74 trillion from KRW 1.56 trillion in 2006. With stronger regulation on discharges and dumping of land waste in seas and oceans, support was expanded for sludge treatment facilities, sewerage facilities in upper streams, as well as for water quality improvement of four major rivers.

- Waste

The 2007 budget for waste (KRW 277.1 billion) is similar to that of 2006 (KRW 276.1 billion) through tacit coordination - a reduction in projects for non-sanitary landfill improvement and an expansion of Mechanical Biological Treatment (MBT).

- Air Quality

The budget in 2007 for air quality was increased by KRW 19.1 billion (5.8%) to KRW 348.6 billion from KRW 329.5 billion in 2006. This budget is mainly allocated to the project for the improvement of metropolitan air quality, countermeasures for climate change, and measures for the prevention and control of Dust and Sandstorms.

- Nature Conservation

The 2007 budget for nature conservation was increased by KRW 39.8 billion (25.0%) to KRW 199.2 billion, compared to KRW 159.4 billion in 2006. This budget is mainly allocated to wetland conservation projects, comprehensive measures for biological

resource conservation, the operation of the National Biological Resources Center, support for environmental conservation facilities, as well as to new projects including electronic mapping of districts for environmental use.

- Environmental Policy & Technology Development

The budget in 2007 for environmental policy and technology development declined by KRW 28.7 billion to KRW 195.3 billion from KRW 224 billion in 2006. The total budget dropped, as environmental improvement funds (KRW 54 billion in 2006) were transferred to the Public Capital Management Funds. But each budget allocated to major projects was increased, including the development of next generation core environmental technology, the establishment of a system for the prevention and control of environmental diseases, support for and research of new chemicals management, environmental technology assessment, and support for technological development.

2007 Budget Framework

- Investment in the Public Health and Projects for Narrowing the Gap in Environmental Services Between Regions

As concerns over public health and environmental diseases such as atopy and asthma have been raised due to environmental pollution and exposure to chemical substances, "receptor-oriented" environmental policies have been driven forward in order to improve living environment around rural/coastal areas, islands, industrial parks, and abandoned mines, so as to solve environmental polarization.

[Table 6] Budget for Environmental Health and Improvement of the Living Environment in Vulnerable Areas

(Unit : KRW100Million)

Category	2006 Budget(A)	2007 Budget(B)	Increase/Decrease (B-A)	%
Establishment of a system for prevention and control of environmentally - related diseases	33	62	29	87.3%
Comprehensive control of risk to public health	8	46	38	495.9%
Developing safe water for rural residents	1,154	1,380	226	19.6%
Field survey on soil pollution around abandoned metal mines	1	23	22	1,630.8%
Soil inspection in the industrial complex	10	20	10	100.0%
Improving waterworks in rural communities	70	70	-	-

- An Increase in Investment in the Improvement of the Living Environment Including Water / Air Quality

To improve the quality of the living environment, investment was mainly destined to surveys of public water areas, ecological surveys of the vicinity of industrial parks, natural stream purification projects (called "close-to-nature works"), air quality improvement projects in metropolitan areas, and measures for the prevention and control of Dust and Sandstorms (DSS).

[Table 7] Current Status of Major Budget Items

(Unit : KRW100Million)

Category	2006 Budget(A)	2007 Budget(B)	Increase/Decrease (B-A)	%
Measures for the Improvement of Metropolitan Air Quality	2,081	2,597	516	24.8%
Management of Areas Vulnerable to Odor and Relevant Facilities	18	23	5	27.0%
Survey of Environmental Capacity of Rivers and Streams	3	10	7	184.1%
Close-to-Nature Works	570	712	142	24.9%
Measures for Prevention and Control of Dust and Sandstorms(DSS)	10	84	74	740.0%

- Conservation and Management of Biological Resources & Building a Resource Circulation System

To conserve biological resources and ecosystem protection areas, support will be granted to increase investment in nature conservation and promote resource circulation.

[Table 8] Current Status of Budget for Biological Resources and the Resource Circulation System (Unit : KRW100Million)

Category	2006 Budget(A)	2007 Budget(B)	Increase/Decrease (B-A)	%
Comprehensive Measures for the Conservation of National Biological Resources	64	71	7	10.5%
Wetland Conservation and Management	42	83	41	98.3%
Management of Ecology/ Preservation Areas	103	118	15	14.0%
Construction of a Resource Circulating Complex	29	57	28	100.0%
Mechanical Biological Treatment (MBT)	-	27	27	Net Increase

- New Budget for New Environmental Demand

15 projects (e.g., the establishment of an RFID-based infectious waste management system) with a budget of KRW 10.3 billion have been driven forward by the need to prepare for newly emerging environmental demand.

[Table 9] Status of New Budget Per Year (Unit : KRW100Million)

Category	2003	2004	2005	2006	2007
Total Budget	14,037	14,519	28,557	29,992	32,232
Scale of New Projects	380	411	224	718	103
No.of Projects	24	24	25	38	15
Projects	24 projects such as the establishment of Advanced Sewerage Treatment Facilities	24 projects such as measures for metropolitan air quality improvement	25 projects for indoor air quality improvement	38 projects such as laying the foundation for environmental health research	15 projects such as the establishment of an RFID-based infectious waste management system

[Table 10] Major New Projects in 2007

(Unit : KRW100Million)

Category	2007 Budget	Contents
Development of a policy for improving the water supply system	15	Categorize water supply systems into groups by area; and develop the best water supply system of each area
Establishment of an RFID-based infectious waste management system	5	Attach electronic tags to infectious waste containers; and manage waste delivered or transferred through an electronic data system
Support for holding the annual IAIA general meeting	3	Support for hosting the International Association for Impact Assessment (IAIA) general meeting
Land Register Notice of district/zones for environmental use	17	Computerize drawings of environmental use districts/zones to mount relevant data to the Land Management Information System (LMIS)
Support for environmental technology assessment and technological development	7	Outsourcing to the Korea Institute of Environmental Science and Technology for new technology authentication, technology verification, and operation of the environmental venture center
Establishment of a national environmental specimen bank	5	Establishment of research laboratories for long-term preservation and analysis of environmental specimen
Construction of a welfare service building	3	A daycare center within the environmental research complex
Establishment of an archive management system	3	Computerize archives in the Ministry of Environment; and construct a database
Establishment of the Administration Information System and cyber environment education/operation	2	As the National Institute of Environmental Human Resources Development was launched, lay the foundation for the Administration Information System and secure the state-of-the-art information technology

Comprehensive National Environmental Plan From 2006 to 2015



Comprehensive National Environmental Plan From 2006 to 2015

The "Comprehensive National Environmental Plan" aims to present the vision and strategy for sustainable development of the nation over the next decade from 2006 to 2015. Central governmental bodies should reflect this plan in setting up and implementing environment-related plans and policies. This plan is the long-term strategy that charts the course of sectoral/regional environmental plans.

In other words, it provides principles and directions on sectoral environmental plans (e.g., air quality, aquatic ecosystems, and nature conservation) and for environmental conservation plans in cities, provinces, and counties.

Vision & Goals

Our environmental plan set the vision of the establishment of a sustainable/advanced nation and four goals - the conservation and expansion of Korea's environmental capacity; the establishment of an environmentally-equal society; the promotion of sustainable resource circulation; and the establishment of a stable

economic system which gives priority to ecological value.

To achieve the aforementioned vision and goals, the Ministry put forward key strategies for environmental management, as well as a framework for national environment management and its institutional mechanisms.

Key Strategies for Environmental Management in 7 Sectors

Key strategies suggested in the Comprehensive National Environmental Plan are for environmental management in seven sectors whose focus shifted from a "media-centered" approach to one which is "receptor-centered." Seven sectors consist of the ecol-

ogy, natural resources, the living environment, the environment & economy, environmental equality, environmental cooperation in North East Asia, and the global environment. Implementation tasks of each sector are also presented.

[Table 11] Key Strategy for Environmental Management in 7 Sectors

Category	2007 Budget
Ecology	<ul style="list-style-type: none"> - Conservation of biological diversity and conservation/restoration of habitats - Conservation and management of beautiful and outstanding landscape
Natural Resources	<ul style="list-style-type: none"> - Sustainable management of water resources and building an energy use system - Promotion of eco-friendly agriculture, protection of fishes, establishment of forestry operation
Living Environment	<ul style="list-style-type: none"> - Safe management of hazardous waste and calm/clean indoor conditions - Clean/blue skies and clean/safe water supply - Eco-friendly living environment and safe treatment/management of waste
Environment & Economy	<ul style="list-style-type: none"> - Eco-friendly consumption and a clean production/environmental operation system - Development of state-of-the-art environmental technologies and promotion of advanced environmental industries linking with job creation
Environmental Equality	<ul style="list-style-type: none"> - Strong protection of people vulnerable to environmental degradation and social minorities - Development and introduction of consistent responsibility principles for damage by environmental pollution
Environmental Cooperation in North East Asia	Strengthening environmental cooperation in Northeast Asia and the active entry into environmental markets in Northeast Asia
Global Environment	Strengthening international cooperation in addressing climate change and conserving the environment

Framework for National Environment Management

The existing environmental plans fell short of linking land development projects with environmental plans. For this reason, the Framework includes space planning, so as to set three core ecological axes and five major zones for environmental management in line with the environmental value of the land.

First of all, three core ecological axes include the Baekdu-Daegan, the DMZ District, and coastal areas and islands.

The Baekdu-Daegan and the DMZ District will be fully

conserved and managed, while coastal areas and islands will be developed and also conserved on the basis of their environmental capacity. Differentiated projects will be formulated for environmentally-friendly development and management in five major regions, respectively the Han River / Metropolitan Area, the Geum River / Chungcheung Area, the Youngsan River / South Jeonla Area, the Nakdong River / South Kyungsang Area, and the Taebak/Gangwon Area.

Framework for National Environment Management



Three Core Ecological Axes

Ecological Axes	Conservation Plan
Baekdu Mountain Range	Conserved/managed as a core ecological axis
The DMZ District	Conserved/managed as an East-West ecological axis
Coastal regions and Islands	Conserved/managed while considering the needs of development

Five Regions for Environmental Management

Region	Conservation & Development
The Han River / Seoul Metropolitan Area	A center for the environment and economy in Northeast Asia through growth management
The Geum River / Chungcheung Area	A leading area for eco-friendly and balanced development of land
The Youngsan River/South Jeonla Area	A core area for making environmental resources more valuable
The Nakdong River / South Kyungsang Area	A hub for eco-friendly industrial innovation
The Taebak / Gangwon Area	A center for ecology and eco-tourism

Sectoral Strategies

To effectively implement the framework and make Korea an advanced and sustainable nation, strategies will be developed for five sectors - policy coordination

and execution, the assessment of environmental impact and economic benefits, budget and investment, governance, and information/education.

[Table 12] Sectoral Strategies

Environmental Management	Contents
Policy Coordination /Execution	Recoordination and strong linkages between environmental policies of each governmental body
Assessment of Environmental Impact and Economic Benefits	The establishment of an integrated basis for environmental conservation and economic development
Budget and Investment	Securing financial resources and encouragement of private investment in the environment
Governance	Definition of roles and responsibilities of each environmental body
Information/Education	Creation of a Comprehensive National Environmental Information System and improvement of environmental education



Blueprint for An Environmentally Advanced Nation in 2015

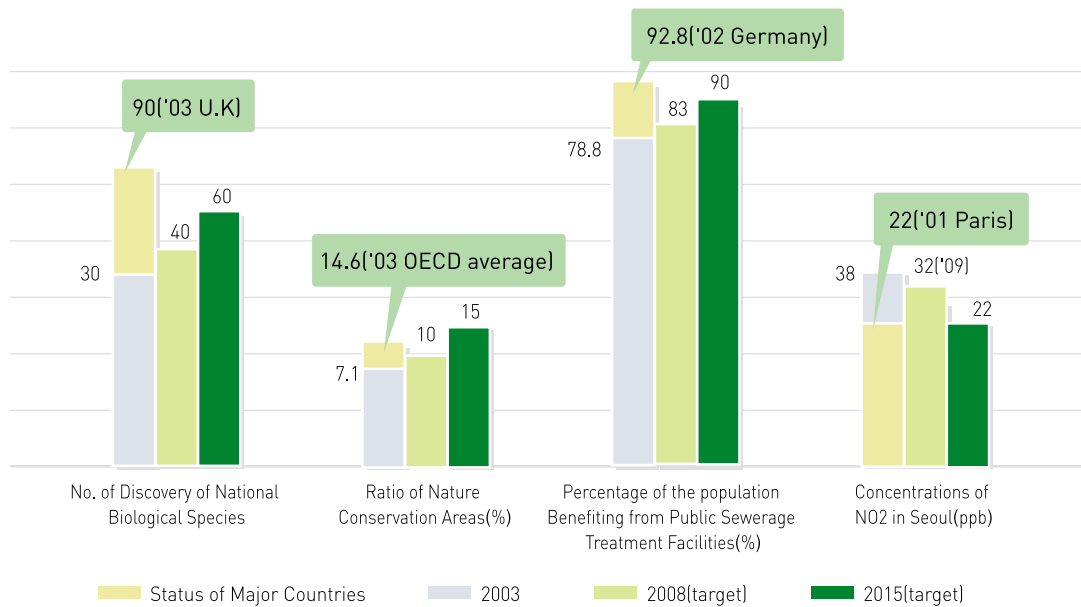
2015, when a comprehensive national environment plan is expected to be completed, will see the Republic of Korea join the ranks of the advanced nations (e.g., the OECD) in the field of the environment. Main indicators in Korea, signaling the quality of natural surroundings and living environment, will be upgraded to the level of those in the OECD. For instance, the concentrations of nitrogen dioxide in

Seoul will be improved from 38ppb in 2003 to 22ppb in 2015.

Sectoral environmental plans and municipal environmental conservation projects will make great contributions to the embodiment and implementation of the comprehensive national environmental plan, so as to realize the blue print for making Korea an advanced environmental country.

[Figure 1]

(unit : thousand)



Action Plans for 2008

- Overview
- Action Plans for Major Tasks
- Improvement of Environment Regulations
- To foster Environmental Industry as the new growth engine

Action Plans for 2008

- Achieving balance between environment and economy

Overview

Paradigm of the new government's environmental policy

The core of the paradigm of new government's environmental policy is to devise and operate practical measures that will improve the quality of environment so that the people can recognize the improvement and live in better condition.

In order to achieve the core objective of the policies, the new government decided to focus on several areas as following;

- By expanding eco areas, green areas and waterfront areas, the government plans to make the urban environment more pleasant and convenient, where more than 90% of population of Korea lives.
- Regarding the environmental health issues, the government plans to establish responding system for water pollution accidents and to introduce chemicals management system for the protection of people's health against environmental pollution and accidents.
- For the areas where local governments or private sectors have expertise, the government will streamline those areas decisively.
- The government will renovate systems and regulations for the areas with many petitions from public, such as noise and foul odor problems, so as to minimize the inconveniences that may occur to the public.
- The government will promote environment friendly development by incorporating environmental plans with national development plans and create healthy and green Korea.

In addition, the new government will take win win approach in promoting environmental policies where environmental conservation and economic development are well-balanced.

Furthermore, environmental regulation will be utilized as a mean to facilitate technological development, enhance eco-friendliness of goods and services, and create new markets. Environmental industry will be fostered as a new growth engine for the future.

Korean government will actively response to and participate in the international endeavor to address global environmental threats such as climate change, resource depletion, and water shortage and utilize the global threat as a new opportunity.

Vision and goals of environmental policies for the period of 2008 to 2012

Vision

To achieve balanced development among environment, economy and society

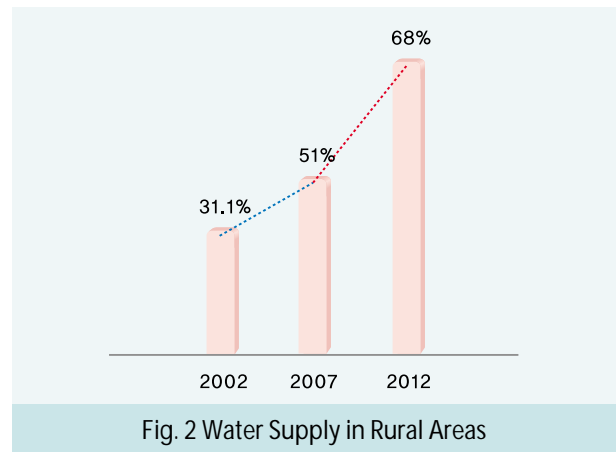
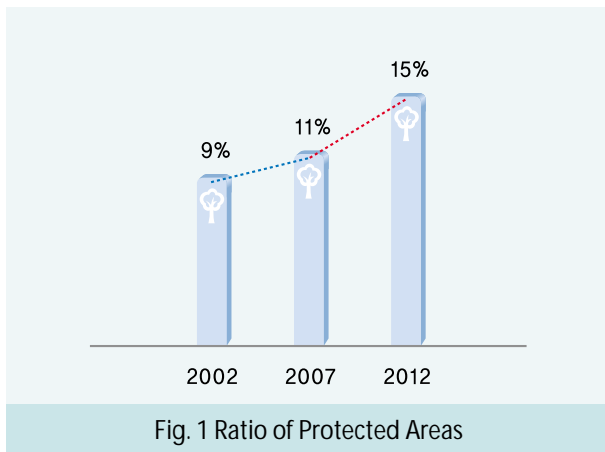
Policy Goals

- To create national environment where nature and human beings coexist with harmony
- To satisfy environmental demands of Korean people through the improvement of living environment
- To foster eco industry as a new growth engine for the future
- To utilize the global environmental threat such as climate change as the opportunity for eco- innovation

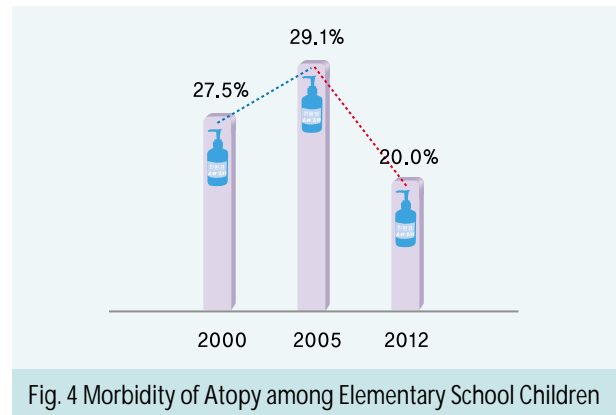
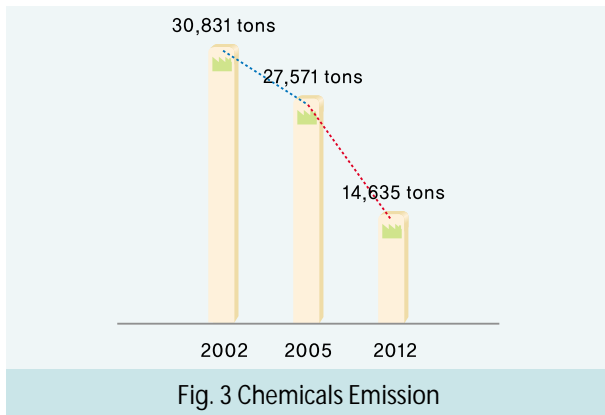


Major environmental indices in 2012

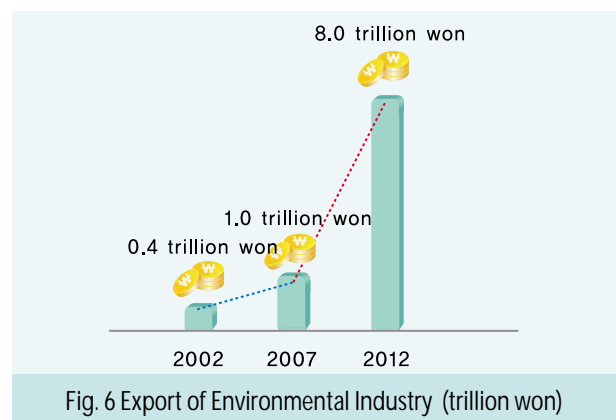
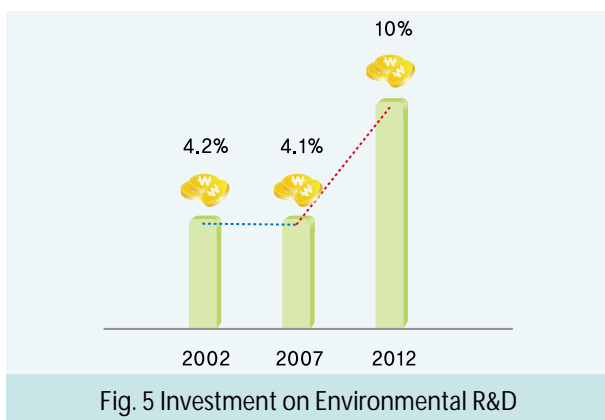
[Nature and Living Environment]



[Environmental Health Area]



[Environment and Economy Area]



Action Plans for Major Tasks

Toward Green Korea

Goals

	2007		2012
Eco trail nationwide	-	→	1,000km
Eco - rivers	55% (14,764km)	→	62% (16,548km)

Action Plans

- To create eco-parks, ponds, watercourses in urban areas-236 sites by 2012

Ministry of Environment will promote 59 projects to transfer river banks and disused railroads into parks (2008)

- To create eco network in the Korean Peninsular

MOE will devise plans to create eco-culture trails nationwide in 2008, and promote the designation of DMZ areas as a UNESCO biosphere reserve and creation of the eco peace park by 2012.

- To fully promote projects for conservation and restoration of water ecology

MOE will survey the conditions of water ecologies of 3,800 rivers, 329 estuary, and 18 lagoons from 2008, and allocate budget for the restoration of eco-rivers (81 rivers, 100km, KRW 130 bil.) and the development of water ecology related technologies (KRW 90 bil., from 2008 to 2014).

- The 10th Meeting of the Conference of the Contracting Parties of Ramsar Convention on wetlands will be held in Korea (Changwon si, Gyeongsangnam do, Oct. 2008)

- To organize a consultation body among related ministries for the establishment of integrated national land management system (2008)

Establishment of the clean and safe water supply system

Goals

	2007		2012
Water supply in rural areas	51%	→	68%

Action Plans

- To improve water pollution accident response system further

In order to improve accident response system, MOE will establish the database of facilities which handle hazardous materials and share the information with other organizations. For the facilities, MOE will facilitate the establishment of buffer storage facilities for industrial complexes and the spill block facilities for individual factories. (2008-2010)

In addition, MOE will strengthen the control and management of water pollution sources such as animal excretions.

- To diversify methods for water collection for the

areas having difficulties in securing clean source water

MOE will perform feasibility study on water collection methods by regions from 2008 to 2009, devise standards for membrane filtering (2008), and promote pilot projects from 2008 to 2010.

- To renovate aged water supply pipes with best available technology

Around 1,600km of aged outdoor water lines will be replaced in 2008. MOE will provide low-income families with assistance in renovation of indoor water lines and establish a real time water quality information system from 2009 to 2012.

Improvement of the capacity in responding environmental diseases and chemicals management

Goals

	2005		2012
Morbidity of atopy among elementary school children	29.1%	→	20%
Chemicals emission	27,571 tons	→	15,000 tons

Action Plans

- To build up a national survey and monitoring system for environmental diseases

In 2008, MOE will perform environmental exposure impact assessment for the vulnerable population including children, pregnant women, and the aged

and health impact survey for the residents of the regions affected by oil spill accidents such as Taean. In addition, the Ministry will designate 3 more research institutes specialized in environmental diseases such as asbestos diseases. (3 institutes to 6 institutes, 2008)

- To gradually improve chemicals management system up to the level of REACH by EU.

In order to strengthen the chemicals management system, the Ministry will increase the number of Good Laboratory Practices (GLP) from 11 to 14 by 2012. Regarding hazardous chemicals such as radon, asbestos and dioxin, the Ministry will prepare and promote comprehensive measures from 2008 to 2012. In addition, the companies exporting to EU member

countries will be helped by the Ministry with pre-registration of REACH from July to December of 2008.

- To strengthen the management of indoor air quality and products for children

In order to improve indoor air quality, the pollutants standards for construction material will be strengthened by 2009. Toxic substances such as lead and cadmium will be banned to use for products for children in 2008. In addition, MOE will perform risk assessment for playground and leisure facilities for children and devise environmental safety standards for those places.

Enhancement of the capacity on climate change

Goals

- To establish low carbon economic and social system for active responding to Post-Kyoto regime in collaboration with related ministries including Prime

Minister's Office, Ministry of Strategy and Finance, Ministry of Knowledge Economy, and Ministry of Land, Transport and Maritime Affairs.

Action Plans

- To establish 'National Climate Change Strategy'

Mid-long term GHG reduction target until 2050 and post-Kyoto negotiation strategy will be devised in 2008. In addition, master plan for climate change adaptation by sectors including environment, health and industry will be established in 2008. MOE will also develop the climate change forecast model that links atmosphere, ocean and vegetation from 2008 to 2010.

In order to reduce greenhouse gases emission, MOE will actively promote the diffusion of CNG buses (21,936 buses by 2010) and hybrid cars (1,930 cars by 2008); CO₂ emission standards for automobiles (2008~2009); installation of Idle Stop & Go devices to buses; and expansion of solar energy and bio fuels.

- To promote the national campaign for creating 「New Climate Culture」

- To reduce greenhouse gases emission through the expansion of environment-friendly energy

In order to create new culture on climate, MOE plans to establish 'Climate Foundation' for the support on

climate change measures, and encourage governmental organizations and public organizations to take the lead in reducing greenhouse gases emission. For the facilitation of scientific research, MOE will designate more graduate schools that specialize in climate change issues (3 to 5 schools, 2008).

Furthermore, MOE will encourage local governments to devise their own measures for climate change and promote them until 2010. These measures include, adaptation measures of Jeju, personal emission quota system of Gwacheon, green transportation and reduction in industrial sector of Changwon in 2007, and emission trade system for public organizations of Busan in 2008.

Improvement of weather forecast

Goals

	2007		2012
Accuracy of forecast	85%	→	86.5%

Action Plans

- To upgrade and introduce hardware for meteorological observation and improve weather forecast model

For the improvement of weather forecast, MOE plans to operate a 'National Meteorological Satellite Center' (2008), build a weather ship (2010) and the 2nd marine meteorological observatory (2011), introduce super computer sets (2009~), and develop integrated numerical forecast models (2008~2010).

- To empower human resources

In order to improve the capability of human resources, the Ministry will invest in fostering numerical forecast experts, from 38 experts in 2007 to 68 experts in 2011. Furthermore, MOE will create positions for the experts

specializing in specific weather events, such as typhoon and dust and sand storm.

- To provide customer oriented communication service in weather forecasting

In order to facilitate communication, real time meteorological information system including internet forecast and SMS will be established in 2008. In the same year, heat caution system will be introduced in order to protect the vulnerable including the aged and children.

Improvement of Environmental Regulations

EIA system

Current Status and Problems

- Depending on the size and stage of a development project, either Prior Environmental Review System (based on Framework Act on Environmental Policy) or Environmental Impact Assessment System (based on Environmental Impact Assessment Act) are applied.
- Since the consultation procedure is complicated and the assessment takes long time, the current system places burdens on the industry.

Improvement Measures

- To perform follow up measures to improve industrial complex system
- To improve EIA system

Task force team for industrial complex assessment will be organized and operated, and the team's support will be expanded to cover all industrial complexes including agriculture & industry complexes. (2008)

By enacting "Environmental Impact Assessment Act", the laws that serve as basis for the EIA, will be integrated to one single law (2008). An expert system for environmental impact assessment will be introduced and fostered (2009).

MOE will develop environmental impact simulation program from 2008 to 2010

Restriction on the establishment of factories at upper stream areas of water source

Current Status and Problems

- Within 10km(local water source) to 20km (water source for wide area) of water source protection areas, and 15km of water collection facility, no factory is allowed to be established.
- Current regulation bans even factories which do not discharge waste water, imposing great restrictions in the development of local economy.

Improvement Measures

- For the factories which do not discharge waste water, the restriction on the location around water sources and water collection facilities will be adjusted.
- ▶ Amendment of the guideline for the location of industries (Sep. 2008)

To foster Environmental industry as the new growth engine

To grow environmental industry through selection and concentration

Goals

	2005		2012
Environmental market share	3.3% (KRW 24 tri.)	→	7% (KRW 67 tri.)
Annual export	KRW 1 tri.	→	KRW 8 tri.

※ In collaboration with Ministry of Strategy and Finance, Ministry of Foreign Affairs and Trade, Ministry of Knowledge Economy, and Ministry of Education, Science and Technology.

Action Plans

- To concentrate the investment on the R&D in the area of promising environmental technology
- provide consulting on foreign marketing strategies, export negotiation and contract

The volume of R&D in the area of environment will be expanded from 4.2% in 2005 (KRW 300 bil.) to 10% in 2012 (KRW 800 bil.). Other than the investment from government, private-public joint fund will be created in order to support the commercialization of new technologies (total KRW 100bil. by 2012). For the human resources development, MOE will designate graduate schools specializing in environmental technologies and support them. (2008~)

- To generate solid foundation for domestic demands for environmental technology

MOE will assist small-medium sized environmental companies to invest in facilities, advance into foreign markets and promote M&A.

Each region will be encouraged to establish specialized complex for environmental industry. Jeonnam and Gwangju have a plan to establish an industrial complex specializing in environment.

- To promote strategies for foreign market differentiated by region

One stop export assistance service will be provided to environmental industry in 2008. MOE will incorporate environmental technology with natural resource diplomacy, by exchanging environmental equipments with natural resources. Currently, MOE operates joint projects for developing customized environmental technology with 4 countries including China and Vietnam (2008~2012).

To foster companies specializing water with global competitiveness

Goals

	2007		2012
Wide range and specialized water supplier	-	→	50%

Action Plans

- To divide water supply industry into 9 wide regions and 26 medium regions.

By transforming water supply into corporations or consigning to private companies, MOE will open new opportunities for private sector to advance into water supply business. Through dividing water supply industry into wide regions and adjusting water supply system, 165 water suppliers (local governments and Korea Water Resources Corporation) will be able to save budgets and reduce debts (approx. KRW 3tri., 2006). 'Water Industry Support Act' will be enacted in order to facilitate reorganizations of the industry in 2008.

- To provide more choices on drinking water for customers

MOE will fully implement mineral water quality certification system and start sale of bottled tap water (2008)

- To establish a system to assist water industry to advance into foreign markets.

MOE will organize private government joint committee to assist water industry to advance into foreign markets and continue to expand ODA in water industry until 2012.



Utilize all available wastes as energy resources

Goals

	Current		2012		2020
Waste-to-energy	1.6%	→	25.3%	→	100%

Action Plans

- To increase and improve 'waste-to-energy' facilities

20 more Mechanical Biological Treatment (MBT) and Refuse Derived Fuel (RDF) facilities will be established until 2012. In addition, 26 landfill gas collection facilities and 20 organic waste-to-gas facilities will be established, generating 1,967Gwh of electricity per year.

- To build policy and institutional basis

'Framework measures for waste-to-energy' will be prepared to facilitate energy recovery from waste, and

many measures such as decreasing governmental subsidies on incineration facilities or imposing landfill charges, will be introduced to encourage waste-to-energy practices (2009~2010)

- To build 'Waste-to-Energy Town' in 4 regions

Waste-to-energy town is where waste-to-energy facilities and cogeneration plants are integrated and concentrated. Feasibility study on Waste-to-Energy Town will be performed in 2008.

Creation of National Carbon Market with the Volume of 1 trillion won

Goals

	2007		2012
Volume of carbon market in Korea	KRW 140 bil.	→	KRW 1 tri.

Action Plans

- To open and operate national carbon market

Through step-by-step operation of carbon market, MOE tries to create demands for carbon emission trade.

Pilot market in association with local government (2008) → inter-market trade (2009) → full implementation of emission trading system (2010)

Certification and verification institutes and trading market will be established(2009)

By utilizing CER, Carbon Trust Fund of 10billion won per year will be raised. (2008)

- To explore CDM project opportunities and establish basis for export

Taskforce team for CDM export will be organized in collaboration with industry, academia and research institutes in 2008. The team will survey CDM demands in Southeast Asia, establish database, and hold road shows.

Achievements in 2006 & Major Tasks for 2007

- Achievements in 2006
- Major Tasks in 2007



Achievements in 2006 & Major Tasks for 2007

Achievements in 2006

A Strong Environmental Health Policy for the Protection of Public Health

The Ministry released its environmental health policies including the formulation of a mid-to long-term road map, the 10-Year Comprehensive Plan on Environmental Health Policy, and the declaration of the First Year of Environmental Health in February 2006. In this vein, the Environmental Health Center was established as a research institute and an integrated environmental standard was set up for protecting the public health.

In particular, the existing environmental policies focused on reducing pollutants in metropolitan areas, but fell short of protecting people and areas vulnerable to environmental pollutants. To address this problem, the Ministry conducted basic surveys of such areas and social classes, and strengthened the monitoring of children's products which contain hazardous substances.

Given the emergence of 300 new chemicals each year and the increased use of hazardous substances in our living environment, the Ministry aimed to minimize the impact of environmental pollution on the public health by conducting environmental surveys to eliminate PCBs, developing a waste tracking system, as well as by enacting a special law on the control of Persistent Organic Pollutants (POPs) like dioxins and developing a life cycle management plan for asbestos, a cause of lung cancer.

In addition, the Ministry constituted a "Chemicals Policy Council" attended by relevant governmental departments and industrial communities to develop a joint response strategy for addressing and managing new chemicals.

The Ministry also reinforced safety management in the use and distribution of chemicals, including the pilot test of a satellite monitoring system for toxic chemical transportation. This system can provide immediate assistance when a traffic accident involving a transport vehicle occurs. Moreover, as concerns were raised over indoor air pollution in facilities such as day-care centers and subways, private day-care centers were included in the category of buildings subject to indoor air quality management, and relevant standards were reinforced as well.

As an example, the testing of hazardous substance emissions was conducted on 800 construction materials including adhesives and paints. The substances exceeding the standards were restricted in use. Moreover, a pilot project for installing the Tele-Monitoring System (TMS) was carried out on public facilities including underground stations and terminals.



A Sound and Healthy Environment for Life

As Strategic Environmental Assessment was launched in earnest in June 2006, the Prior Environmental Review System was expanded to the administrative planning stage, reviewing the appropriateness of locations and the validity of development plans.

Opinions were also collected from interested parties such as experts, residents and civic groups, aiming to prevent any social conflict or economic loss involved in development and conservation.

A "landscape review system" has also been introduced in January 2006 and applied to development projects within scenic areas in an attempt to encourage development in harmony with natural surroundings.

The "Task Force for Improving the Process of EIA" and the "Forum for Improving EIA" were formulated and operated to dramatically enhance Environmental Impact Assessment (EIA) - for example, establishing a mandatory scoping procedure and making assessment reports public.

Based on this effort, an amendment of "the Act on Assessment of Impacts of Works on Environment, Traffic, Disasters, etc" and its regulations has been in progress. Objectivity and fairness in the EIA process are expected to be strengthened, and efficient EIA should impose the minimum cost burden on businesses starting in 2008 when the improved EIA will be launched in earnest. In particular, concerns have been

rising over severe damage to natural ecosystems by growing public demand for supply-oriented land development policies and the use of the natural environment.

In this situation, the Ministry has prepared a framework for the management of the three core ecological axes, including the Baekdu-Daegan Protection Areas, the Ecosystems of the DMZ and vicinity, and the coastal regions and islands. Continued efforts have been made to establish and manage an eco-network for the Korean peninsula by conducting comprehensive research on excellently preserved areas, expanding the designated conservation areas, as well as carrying out a pilot test of Biotope Area Factors.

To preserve and manage the biological resources of the country systematically, a detailed workplan for the restoration of endangered species from 2006 to 2014 has been established and implemented to carry out the national survey of 221 endangered species and a genetic analysis of major endangered species to identify indigenous species.

A comprehensive plan for the management of damaged tourism sites, with a budget of KRW 7.9 billion, has also been formulated to upgrade 47 mountain sites including Mt. Jiri to improve eco-friendly public facilities and restore access roads damaged by too many visitors.

A Sound and Livable Environment

To secure and maintain clean air, the Ministry has pursued an eco-friendly regional development by setting up a regional emission cap for three capital areas (Seoul City, Incheon City, and Gyeonggi province), has reinforced control over specific diesel-fueled vehicles, especially old ones operating in metropolitan areas, and encouraged the manufacture and distribution of low emission vehicles such as hybrid cars, low emission diesel vehicles and electronic bicycles.

In addition, cooperating with other governmental bodies, the Ministry developed an integrated management plan for three sectors - land use, transportation and energy - to improve air quality in metropolitan areas. In order to create a safe and ecologically healthy aquatic environment, the Ministry has developed a water environment management master plan covering the years 2006 to 2015. Based on this, a stepwise water management plan was set up which deals with small stream zones (813 in total) and main stream zones (159 in total) under the jurisdiction of each River Basin Regional Office and municipality.

In furtherance of this, water quality standards and comprehensive assessment methods were introduced which focused on the public health and a healthy aquatic environment, and a system was established for risk assessment and management in water areas for the public use.

For a clean and safe drinking water system, the

Ministry has installed an advanced drinking water purification facility, driven forward a "project for making tap water with a natural taste", provided water supply facilities to less privileged areas, and improved the standard for drinking water quality. To improve the regional environmental conditions, public sewage treatment facilities were expanded to preserve the natural environment in urban, rural and coastal areas. Centering on 29 local governments, the Ministry has launched the private sector led BTL (Build-Transfer-Lease) sewage maintenance projects.

To improve groundwater quality and land conservation, the Ministry formulated measures for a thorough environmental investigation of vulnerable sites such as industrial complexes and abandoned metal mines and for their restoration, and drove forward a stepwise mandatory installation of oil tanks with double walls and pipes at gas stations.

A "Clean Gas Station" without any concern over a possibility of groundwater and soil contamination has been established as a test project. To enhance a pleasant and comfortable living environment, the Ministry has expanded the scope of metropolitan traffic noise control zones to include facilities that require tranquility and relaxation, such as nursing homes for seniors and patients and resorts, and developed guidelines on noise mapping to identify victims of noise exposure and conduct a noise impact assessment.

The Establishment of a Sustainable Resource Circulating Society

The Ministry has driven forward the development of an eco-city model which should create environmentally-friendly cities and concurrently enhance the quality of residents' lives; it also developed a regional environmental conservation plan identifying the features of urban and rural communities.

To support enterprises' environmental management, the Ministry has encouraged the public to buy eco-products, expanded voluntary agreements with relevant companies for green purchasing, and increased the number of eco-labelling products.

At the same time, the Ministry has conducted research on recent global trends in sustainable management, developed the methodology for sustainable management in the environmental, economic and social fields and supported gap analysis with a leading company in sustainable management by distributing a self-diagnosis program for sustainable management.

To develop futuristic core environmental technology and foster a world-class environmental industry, the Ministry has conducted the second stage Eco-STAR program, aiming to join the ranks of advanced countries through the development of next-generation core environmental technology, and also enhanced the competitiveness of domestic companies in the environmental sector through facilitating an environ-

mental consulting business.

To develop an institutional basis for resource circulating, the Ministry has introduced a system for resource circulating assessment which evaluates circulating products and identifies possibilities for their appropriate treatment. The nurturing and development of the recycling industry was actively begun through a test project for building a resource circulating complex.

Moreover, a mid-to long-term road map was drawn up for increasing products subject to the Extended Producer Responsibility (EPR) and the recycling of all materials collected.

At the same time, to increase the sustainability of water use, the Ministry invested a total of KRW 102.3 billion in building sewage reuse facilities at seven sewage treatment plants, so as to supply 80 million tons of treated sewage water annually.

Also, a plan was set up for fostering the reuse of sewage as a new emerging market for the water industry. As the result of a survey on the public awareness of environmental problems, a 10 year comprehensive plan for environmental education was formulated which enables the public to actively participate in environmental action. Also, tailored environmental information was provided through diverse media by age and social class.

Taking the Lead in Global Sustainable Development

To enhance the national capacity for addressing climate change and develop relevant responding strategies, much effort has been made as follows: the Tele-Monitoring System (TMS) was used to carry out a CO₂ emission survey on four industries including power generation; emission factors and the amount of emissions were developed in which real measurement values were reflected; a trial emissions trading was conducted twice a year in major industries, such as the petrochemical and semiconductor industries; and a preventive warning system was developed for abnormal heat in summer.

Regarding environmental negotiations including the Doha Development Agenda and Free Trade Agreements, the Ministry has analyzed the current status of environmental markets, preparing for the launch of Korea-U.S. and Korea-China FTA talks. In the preparation of international environmental regulations, a One-Stop Trade Environment Information System was also established which linked environ-

mental regulations and self-examination with a tool for enhancing the environmental quality of products.

To promote leadership in international environmental cooperation, the Ministry launched the second-phase ADB-GEF project which included participation in the 8th Tripartite Environment Ministers Meeting among Korea, China and Japan and the establishment of a Northeast Asia yellow dust monitoring network.

Moreover, the Ministry has concluded the Korea-UNEP agreement and deposited a total of KRW 4 billion in domestic trust funds by using its budget and the Inter Korean Cooperation Fund of the Ministry of Unification. In furtherance of this, the Ministry actively responded to the OECD Environmental Performance Assessment which could have great influence on the national image for the next seven to eight years and introduced best practices in Korea's environmental policies to the world.



Major Tasks in 2007

2007 was the year of promoting environmental health policies to protect the public health and improve the living environment based on established advanced environmental policies.

To build a sustainable and environmentally-friendly nation, the government set up and proceeded with various environmental policies to achieve its vision of "a beautiful environment and a healthy future".

This vision was to build an ecologically sound and

healthy urban environment; to strengthen environmental health policies for protecting the public health; to conserve natural resources and manage the land environment in a preventive way; to keep aquatic ecosystems healthy and sustainable; to save resources and improve resource circulation; to enhance our efforts toward a more pleasant and comfortable environment; and to strengthen international cooperation.

An Ecologically Sound and Healthy Urban Environment

The Establishment of a Sustainable Urban Environmental Management System

Quantitative urban development in Korea has not been harmonious with the natural environment, which has led to degradation in the quality of life in cities compared to the advanced countries. In this situation, not only the public interest in the quality of life, but also public demand for a sound and comfortable living environment have been rising.

In this vein, the Ministry complemented guidelines on environmental conservation plans for municipalities in an attempt to create urban spaces based on the Environment First Policy, and provided guidelines on eco-friendly city planning.

In addition, an environmental ecological plan was promoted which spatialized data and information on conservation areas and their ecological characteristics, especially in the case of large-scale development projects such as creating new towns and land develop-

ment for housing.

To encourage eco-friendly urban development, the Ministry provided guidelines and information necessary for Environmental Impact Assessment and developed urban environmental indicators which show the current status and goals of environmental ecology.

Moreover, "a city with its own personality" was driven forward to create a sound urban environment where ecology is harmonious with culture. Urban environmental assets were unearthed, so as to promote them as local brands. Furthermore, as an effort to lay the foundation for boosting urban environmental quality, the Ministry created a model for economically self-sufficient and environmentally -friendly regional development, especially in the restricted land use areas.

Improving the Eco-Friendliness of the Urban Environment

To set up the basis for urban ecological design and restoration, the Ministry expanded on a step-by-step basis the biotope areas in urban living environments, including the mandatory application of Biotope Area Factors when building new towns. Biotope maps which classify the ecological types of each region and its conservation value were created and used for the development and ecological restoration of urban ecosystems as well as for city planning.

Plus, a framework was developed for establishing ecologically-sound land, environment and comfortable living surroundings by linking urban ecological axes

with primary ones. A management basis for conservation and restoration of urban and primary ecological axes was formulated by drafting the results of research on primary ecological axes and creating their networks.

In addition to this effort, the Ministry enhanced the ecological friendliness of the urban environment by pushing forward ecological streams restoration, promoting water recycling use and improving its structure, as well as intensively managing urban non-point pollution sources through sewage treatment facilities.

Upgrading Urban Air Quality to Advanced Levels

Over the next five years, much effort will be made to improve air quality in metropolitan areas (Seoul City, Gyeonggi province, and five metropolitan cities) so as to meet the strong air quality standards that were applied in 2007 for Particulate Matters (PM10: $70 \mu\text{g}/\text{m}^3 \rightarrow 50 \mu\text{g}/\text{m}^3$) and Nitrogen dioxide (NO₂: 50ppb \rightarrow 30ppb).

To this end, the Ministry launched an emission cap system, focusing in particular on the Seoul urban area which is notorious for serious pollution issues; and applied to businesses an emissions cap and allowance trading system for sulfur oxides and nitrogen oxides. The Ministry conducted an initial performance assessment of measures for improving air quality of the capital area, including the attachment of exhaust emission reduction devices. For a stepwise improvement of urban air quality, the Ministry aimed to lower ozone concentrations by reducing two major sources,

volatile organic compounds (VOCs) and nitrogen oxides (NO_x).

To this end, firstly, a device was attached to gas pumps to retrieve the vapors including VOCs. Secondly, the standard for VOCs contained in paints which are supplied to the capital area was upgraded to the level of that in advanced countries. Thirdly, measures were developed for reducing non-point pollution sources for compounds such as VOCs. Fourth, the emission standard for NO_x from vehicles manufactured has been reinforced on a step-by-step basis. Last but not least, support was granted to the installation of devices for reducing NO_x emissions from businesses. In an effort to establish a "cool city," the Ministry developed "city climate maps" which show at a glance green areas, hot spots of air pollution, as well as wind flow through urban street canyons to alleviate the urban heat island phenomenon.

The provision of eco-friendly fuels was expanded through improving industrial heavy oil, increasing provisions of low-sulfur gasoline, and promoting the use of biodiesel for automobiles running on diesel.

A variety of measures were taken to enhance eco-friendliness of urban traffic conditions. Included were early commercialization of zero- and low-emission motor vehicles and upgrade of emission standards to the level of that in advanced countries. An emission certification system was also strengthened, and the management of off-road mobile sources will be

enhanced as well. Also, measures for eco-friendly traffic demand management which deal with both traffic congestion and air quality in a comprehensive way were adopted. At the same time, to advance the emission control system of vehicles in use, the Ministry is building a comprehensive electronic system to control their emissions, which covers the entire life cycle of cars from newly manufactured vehicles to End of Life Vehicles(from 2007 to 2008).

A Sound and Healthy Livable Environment

To meet public demand for high quality of living, the Ministry focused mainly on making the living environment clean and comfortable. To this end, with comprehensive measures for food culture improvement from 2006 to 2012, actions have been taken for reducing municipal wastes which include a reasonable price for volume-based waste bags according to the Polluter Pays Principle, and the improvement of ways to collect and divide municipal waste through installing automatic waste collection devices at apartment complexes. With regard to municipal noise, the standards were set up for regulating noise generated in the same building such as piano institutes and night clubs, and programs were also developed for noise mapping which shows the current status of urban noise. Concurrently, the Ministry implemented a mandatory noise labeling to reduce construction noise and promote the use of low-noise construction machinery.

In particular, facilities subject to indoor air quality standards were expanded, ranging from national/pub-

lic ones of 1,000 m^2 or more to private facilities of a certain scale, so as to protect the public health. Standards for indoor air quality management were rationalized, including upgrading the level of formaldehyde to that recommended by WHO. Moreover, support has been granted to industrial businesses for reducing offensive odor by creating buffer green zones near industrial complexes (since 2003). Customized technological assistance has been provided to businesses producing foul odor in order to help them build capacity for foul odor management(since 2006). A manual for foul odor management has been developed and distributed (since 2007). The Foul Odor Prevention Act will be amended, including the reinforcement of standards for odor emissions around school zones.

A Strong Environmental Health Policy for the Protection of the Public Health

The Control and Prevention of Environmental Degradation Which Threatens Public Health

As concerns have been raised over the health impact of the so-called environmental diseases like asthma and atopy, Sick House Syndrome (SHS) and exposure to hazardous substances contained in children's products, the Ministry has implemented plans to set up strong environmental health policies to protect the public health, shifting policy focus from a "media-oriented" approach to a "receptor-oriented" integrated management which is based on environmental capacity.

To secure and improve institutional infrastructure for environmental health policies, three centers for atopy, asthma and developmental disability were designated in 2007 and expanded to eleven centers nationwide by 2009.

The Ministry has formulated the basis for environmental health policies which includes the implementation of the Ten Year Comprehensive Plan on Environmental Health Policy and the revision of the Environmental Health Act.

Plans for integrated risk management to protect the

High Standards for Chemical Safety Management

The basis for scientific management for the emissions and distribution of chemicals was strengthened for the reinforcement of chemical safety management. The number of new chemicals subject to hazard assessment was increased to that of the OECD levels.

In addition, chemical accident response and safety management were strengthened through continued

public health include a detailed risk assessment regarding hazardous substances, especially substances such as benzene, nickel and chrome, and the formulation and operation of a group that will be responsible for integrated risk assessment.

To protect children from hazardous substances, surveys were conducted regarding exposure to hazardous substances in playgrounds, daycare centers, private institutes and school zones, as well as risk assessment of hazardous substances contained in children's products such as toys and stationary. Relevant measures were also taken. A routine monitoring of daily goods has protected the public from the risk of hazardous substances.

Furthermore, to establish a system for preventing and managing environmental diseases, diverse surveys were carried out, regarding hazardous substances in the blood, the impact of environmental pollution on pregnant women and infants, populations vulnerable to environmental diseases, and residents living around abandoned mines.

improvement in a chemical accident response information system, expansion of equipment for chemical accident response, as well as through nurturing and training experts.

In preparation for the effectuation of the Registration, Evaluation and Authorization of Chemicals (REACH) and international trends in strong chemical manage-

ment, the Ministry has monitored and analyzed the stances of the EU and non-EU countries on chemical safety and encouraged the industrial community to prepare for REACH.

To this end, tailored support has been provided through the establishment and operation of help desks and industrial consortiums differentiated by major chemicals and types of business, as well as through the implementation of a project for sharing information on chemical hazards.

In addition to this, Good Laboratory Practices (GLP) have been expanded and improved. With the systematic management for persistent organic pollutants (POPs), a strong safety management system has been

developed for specific hazardous chemicals, which includes the survey of chemical persistence at 50 major sites nationwide, the designation of sites with possible concern over contamination, and strong control over Hazardous Air Pollutants (HAPs) generated during industrial processes. Based on data from safety tests of existing chemicals and hazard assessment of new chemicals, as well as from initial risk assessment conducted by the OECD, information on hazardous chemical regulation has been analyzed and its database built on a step-by-step basis, so as to establish an integrated information system for chemicals and an accident response system for toxic chemical transportation.

Conservation of Natural Resources and Preventive Management of the National Environment

Ecological Land Management Through Conservation and Restoration

The rapid industrialization over the past decades which focused on using and developing the nature has led to loss of natural resources and ecosystem degradation. But now, it is urgent to effectively protect land ecosystems and improve the quality of life by conserving and restoring natural resources and preventively managing the national environment.

To achieve the goal, firstly, natural reserves have been expanded and their management reinforced. Based on the 2006 NIER survey on the natural environment of uninhabited islands in Korea, some of them were designated as protection areas.

The standards for designating and managing protection areas are being improved to the level of those in the advanced countries. Active support is being provided not only to the development of measures for

ecosystem preservation in protection areas but also to the promotion of public trust activities to purchase and conserve private natural assets.

Moreover, to conserve three core ecological axes - the Baekdu-Daegan Protection Area, the ecosystem surrounding the DMZ (Demilitarized Zone) District, and coastal regions and islands - the Ministry has pursued the designation of the Baekdu-Daegan Protection Area and the DMZ District as UNESCO Biosphere reserves.

Secondly, much effort was made to restore damaged natural ecosystems. To this end, the legal basis has been set up that enables a third party (e.g., a special agency for ecological restoration) to use funds for ecosystem conservation paid by developers. A "comprehensive plan for restoring the natural environ-

ment" will be established which includes training professionals and developing technologies. The increase in the designation of excellent preserved villages and ecologically restored ones has raised the pride of local residents and induced the active participation of residents in regional environmental conservation. At the same time, a "total natural resources load management" system will be introduced which includes wetlands and green areas, together with the implementation of restoration projects for damaged ecosystems (e.g., national parks).

Thirdly, eco-friendly use of natural resources has been

facilitated. In order to promote eco-tourism which is harmonious with nature, the Ministry has divided the nation into 5 to 7 areas to create a network for ecological access roads within each area. The Ministry has also developed and managed diverse programs to improve eco-tourism to national parks and improve and expand eco-friendly leisure facilities in which the public can take a rest and have opportunities of field study and ecological observation.

A Framework for Advanced Bio-Resources Management

The Ministry intends to balance ecosystems and also focuses on discovering new biological resources and managing indigenous species. In this vein, the Ministry aimed to contribute to the prevention of wildlife extinction and conservation of biological diversity through systematic protection and management of wildlife.

To this end, the survey of indigenous species, especially in forest, tidal land, estuaries, wetlands, oceans, and coastal areas, was conducted and a database of information collected from said survey is being built. The database includes the place where the information was collected, breeding sites/habitats, and the ecological characteristics of wildlife.

Moreover, the Ministry made efforts to proliferate and restore endangered species, build an integrated information network for biological resources in Korea, as well as analyze the genes which are the basis for the biotechnology industry.

In order to secure biological diversity, the Ministry will increase the number of wildlife rescue and management centers in 16 cities and provinces from ten in 2007 to 16 in 2011 (by opening two centers every year.) With measures for preventing poaching and illegal wildlife trade and for preventing agricultural wildlife damage, projects for international cooperation in protecting migratory birds have been promoted. Continued efforts have also been made to increase eco-bridges and promote biodiversity management agreements.

Additionally, to meet global standards for bio-resource management, the management of alien species has been strengthened, concurrently with the risk assessment of genetically modified organisms (GMOs), and the implementation of international cooperative projects for biosphere conservation and conducting research on long-term changes in Korean ecosystems.

Improvement in Credibility Through Innovative Environmental Impact Assessment & Contribution to Land Conservation

To promote environmental conservation and an integrated management for the national environment, the Ministry has sought to establish a close link between an environmental conservation plan and a land development plan, set up the principle, "environment first, development second", as well as use eco-governance for protecting the national environment. Notably, the Ministry will encourage sustainable regional development through scientific assessment methodology including an environmental capacity.

In addition, efforts to establish an Integrated Environmental Impact Assessment system included: firstly, a draft for integrated environmental assessment which will be developed to streamline institutional foundations for the Prior Environmental Review System (PERS) and Environmental Impact Assessment (EIA); secondly, the Environmental Impact Assessment Policy Council will be assembled in order to reinforce a

preliminary internal review on environmentally sensitive and large-scale development projects; and thirdly, the system will be established for a post-management of environmental impact assessment. Concurrently, for the innovative operation of environmental impact assessment, a customer satisfaction survey is being conducted, and projects for institutional improvement have been developed.

The review process and paper work for development projects which have little impact on the environment have been dramatically reduced, so as to prevent social and economic loss. Moreover, regular updates of national environmental information, such as environmental geographical information and the database of the EIA and PERS, have helped the public conduct the EIA. An integrated system of the Land and Environment Information Center has been promoted as well.



An Ecologically Sound Aquatic Environment and its Sustainable Use

Strong Risk Management for Watersheds and Keeping Aquatic Ecosystems Healthy

The focus of water policy has been shifted to the conservation of healthy aquatic ecosystems and risk management from physico-chemical water quality management mainly concentrating on the treatment of water pollution materials, such as Bio-chemical Oxygen Demand (BOD).

In this situation, it is necessary to develop and implement policies for water supply and sewerage service in order to conserve our living environment and to promote sustainable use of water.

To restore aquatic ecosystems ranging from water sources to estuaries, guidelines on business models and standards have been provided as a manual for natural stream conservation and restoration.

Additionally, a mid- to long-term strategy has been set up to introduce systematic management for riparian zones, along with measures for managing farmlands surrounding principal sources of water supply in upper streams.

For risk assessment of public water areas and the establishment of their management system, the Ministry will start in 2011 the risk assessment of aquat-

ic ecosystems at the five main watersheds which are expected to be under chronic exposure to chemical substances.

Emission standards will be applied for eco-toxicity tests which use some species (e.g., water fleas). Waste water emission standards will be set after taking into consideration the characteristics of waste water produced by individual businesses and the development of waste water treatment technologies.

At the same time, to reinforce control over industrial waste water and water pollution, in 2007, the "Water Quality Tele-Metering System (Automatic Measurement Item : Ph, BOD, COD, SS, T-N, T-P)" was established for the first time in the world. The system was introduced in public sewage treatment facilities (daily treatment capacity of more than 2,000 cubic meters), final wastewater treatment plants (daily discharge amount of more than 700 cubic meters) and wastewater-discharging businesses (daily discharge amount of more than 200 cubic meters). By 2009, the system will be phased in at about 600 plants. Buffer storage facilities will be set up to prevent initial rains and effluents of industrial parks from directly entering into streams.

Advanced River Basin Management System Including the Total Maximum Daily Load Management System (TMDL)

The Ministry focused on two ways to meet the needs of the public for water policies: one was a prevention policy including the Total Maximum Daily Load

Management System (TMDL); the other was to put in place a river basin management system in both upper and lower streams and to build a new basis for a water

environment policy.

First of all, to put the TMDL in place, relevant Acts and regulations has been amended to expand the areas which conduct the TMDL, from four major rivers to the other watersheds of the Sapkyo stream, the Hyungsan river, and the Taehwa river and so on; the second stage TMDL target (2011-2015) was set on the watersheds of three major rivers which mark the boundaries between cities and provinces.

Moreover, the Ministry has formulated and implemented an aquatic environment management plan with experts, municipalities, and local environmental offices for major streams (e.g., Kyungahn stream, Ahnyang stream, Gap stream in Daejeon, Sin stream in Daegu) which are the most polluted and ecologically damaged.

Secondly, efforts to build a basis for new water environment policies included: the mid- to long-term framework for a water quality monitoring network was established to assess and manage policies for improving the water environment; monitoring networks were set up to identify whether the water environment target of each small stream zone was achieved; water quality assessment methods which use biological indicators will be introduced; and ecological indicators for monitoring aquatic ecosystems will be developed to provide information by regional stream and river basin.

Laying the Groundwork for the Best Quality Tap Water in the World

To meet the public need for world-class quality tap water, the Ministry has implemented projects for fostering global competitiveness in the water industry

Thirdly, to put in place an advanced system for managing river basins in both upper and lower streams, the Ministry launched a pilot project to set up and manage an integrated network for Nakdong River Basin in cooperation with local NGOs, aiming to expand such a network to each regional watershed across the country. The Ministry shifted the focus of the allocation and procedure of funds for watersheds at four major rivers from a compensation-oriented approach to a performance-oriented one which is based on the mid- to long-term plan for managing the funds.

Last but not least, to strengthen measures for managing non-point source pollution and livestock waste, farming areas at high altitude and urban areas which are the source of non-point source pollutants have been designated as areas requiring management; the obligation of managing non-point source pollutants has been imposed on a wider range of businesses; given the types of land use in the watersheds of four major rivers, test projects for establishing facilities to reduce non-points source pollution are being implemented at 42 sites using KRW 52.5 billion. Measures for the monitoring and management of them will be taken; and continued efforts were made to convert livestock waste into energy resources and enhance the operation rate and effectiveness of public waste treatment facilities.

through the restructuring of the tap water industry.

The size of the water industry is expected to grow to KRW 20 trillion in 2015 from KRW 10 trillion in 2003.

Therefore, the Ministry has set up a five year plan for fostering the water industry during the period from 2007 to 2011, so as to develop this important industry as a new growth engine with the greatest potential.

In addition, the method of eliminating pollutants by micro-filter could help improve the quality and taste of tap water. This will be applied to water purification plants (5 tons or more in size) from July 2009.

Expanded Sewerage Services & Sustainable Water use

The Ministry Planned to expand public sewerage services to rural areas, improve the operation and management of sewerage services, and prevent water pollution in public water areas such as streams, rivers, and lakes.

To make the living environment clean and comfortable, the Ministry has bolstered the private sector-led BTL (Build-Transfer-Lease) program from 2005 to 2008, with a budget of KRW 5.6 trillion. Of this budget, KRW 1.3 trillion was granted in 2007.

To narrow the sewerage service gap, the sewerage service rate in towns, villages and rural areas increased to 44% in 2007 from 35.8% in 2005; and facility investment in public sewerage service was expanded from urban and highly populated areas to rural areas and dam sites in upper streams.

Much effort was made to manage old water supply pipes and reinforce quality standards for tap water, so as to provide clean and safe water. Furthermore, support was granted to develop water sources in rural and coastal areas and islands where the present water supply is not sufficient, and thereby, narrow the water supply gap between urban and rural areas.

A comprehensive improvement measure was formulated for sewerage service and waste water treatment facilities in rural areas. In 2007, KRW 115.4 billion was spent establishing and improving 309 small sewage treatment facilities.

Moreover, to enhance the effectiveness and economically efficient operation and management of public sewage treatment facilities, research projects were conducted for promoting outsourcing to the private sector.

Furthermore, in preparation for regulations on sewage sludge entering the oceans, a budget of KRW 119.2 billion has been used for establishing/refurbishing 55 sewage sludge treatment facilities (15 existing and 40 new ones), so as to ameliorate the impact of the sewerage service upon the ocean environment, ecology, and ecosystem.

A Strong and Advanced Management System for Soil and Groundwater

The Ministry increased the number of "Clean Gas Stations" equipped with double walls and pipes for preventing soil contamination to 49 stations in 2007 from two in 2006 to prevent soil pollution and intensively manage sites vulnerable to environmental pollution.

Measures for purifying polluted sites and dangerous areas have been taken by investigating large-scale industrial complexes and abandoned metal mines. The expansion of groundwater quality monitoring

networks raised the credibility of water quality monitoring.

The introduction of a quality certification system for drinking water has led to the provision of higher quality and safer drinking water. To secure public trust, the Ministry took measures to create a double-check between the municipalities and the water inspection agency in the monitoring of drinking water quality. Furthermore, a real-time, on-line database system was built for potable groundwater quality results.



Resource Saving and Improved Resources Circulation

An Advanced Management System for Hazardous Waste

As the public has an interest in the quality of life and international regulations have been strengthened on hazardous waste, it has become urgent to manage harmful waste, which has great potential to contaminate our living environment and threaten the public health, in an appropriate way. In this vein, to advance standards for classifying and managing hazardous waste, measures were taken for tests, analysis, and management of hazardous substances, as well as for infectious waste and asbestos.

In furtherance to this, standards were set up for management of hazardous substances from used electrical /electronic equipment and automobiles.

Secondly, to manage and treat hazardous waste in an appropriate way, measures were formulated and implemented for municipal hazardous waste (e.g.,

abandoned medicine, thermometers, and packing materials of abandoned pesticide), as well as for importing /exporting hazardous waste.

Continuous efforts were made to develop a strategy for preventing and disposing of abandoned waste through administrative execution and the operation of a waste disposal deposit-refund system.

Thirdly, for the systematic waste management, the enforcement ordinance of the Waste Control Act was amended to determine the types of industrial waste subject to a waste manifest system; and a basis was prepared for monitoring the generation, transportation, and treatment of infectious waste by using RFID (Radio Frequency Identification).

Promotion of the Conversion of Waste to Energy Resources

It is necessary to develop measures for converting municipal and industrial waste into resources in order to prevent the destruction of ecosystems caused by excessive waste generation and to solve the shortage of landfills. To this end, "quality-oriented circulation" was promoted.

First of all, to facilitate recycling of resources, a "recyclable aggregate quality certification system" was implemented to promote recycling of high value-added construction waste. Food waste was converted to high-quality livestock feed, compost, landfill cover soil, and diverse recycled products, creating new demand. Moreover, the capture and recycling of land-

fill methane emissions were launched in earnest through facilitating the energy recovery and use of existing and newly-built incinerators and operating a power generation facility (50MW/h) at Sudokwon Landfill Site Management Corporation (SLC). The recycling of electronic equipment, furniture, wood, and abandoned plastic bags from agricultural sites was facilitated.

Secondly, to facilitate resource circulation, the fourth basic plan for resource recycling from 2008 to 2012 was formulated to set recycling targets and develop recycling policies over the next five years. The Ministry also improved the Extended Producer Responsibility (EPR) system to clarify the responsibility for transport-

ing collected and sorted waste (e.g., fluorescent lamps, films, and electronic appliances) to recycling sites.

Thirdly, to expand infrastructure for resource circulation, the Ministry installed 32 public waste sorting sites at cities, towns and villages, one battery collecting / sorting / recycling site in metropolitan areas, and 10,000 battery collection boxes, with a budget of KRW 10.3 billion.

Furthermore, to foster and support the recycling industry, the Ministry analyzed the current status of the recycling industry tax reduction and developed measures for supporting the private recycling sector.

Waste Reduction and Safe Waste Treatment

The Ministry restricted the amount of municipal waste generated by a person during a day to within 0.99kg and reduced the growth rate of industrial waste to 5% or less, as well as strengthened safety standards through the continued expansion and improvement of garbage treatment facilities.

To this end, measures were developed for reducing the use of disposable items at large department stores, restaurants and shops that serve take-out coffee, and public agencies and institutions.

The Ministry also provided guidelines for each industry to help them reduce waste.

Secondly, to reinforce an institutional basis for waste reduction and safe treatment, the Ministry set plans to revise the second comprehensive plan for national waste management from 2002 to 2011 to reflect

A budget of KRW 65 billion was allocated to the recycling industry so as to improve the structure of the domestic recycling industry and its business environment.

The role of the Korea Environment Corporation was promoted in facilitating waste treatment, and encouraging the conversion of waste to resources. Last but not least, to successfully put into action, the "Act for Resource Recycling of Electrical/Electronic Products and Automobiles," the Ministry developed a program for supporting recycling businesses and improve the operation of the information management system to include data on construction waste and to promote the use of recycled aggregate.

changes in social, economic and environmental conditions; and set a new vision and strategy for waste management.

To improve the waste treatment fee system, the rate of waste fees, only 7% of the real treatment cost on average, was increased to the real level of treatment cost; but charges were imposed on final wastes only.

Thirdly, to expand the infrastructure for the safe treatment of waste, with a budget of KRW 98 billion, the Ministry improved 32 incinerators, 27 landfill facilities, 22 food waste treatment facilities, and 22 insanitary landfills.

A basis for measuring and analyzing dioxin was prepared, with the establishment of a comprehensive rural waste treatment facility. Finally, the Ministry con-

ducted a campaign for reducing disposable items and packaging materials, and promoted the eco-friendly operation of municipal waste treatment facilities.

To encourage public participation, active support was

provided to the activities of civic groups (e.g., The Korea Zero Waste Movement Network) to reduce and recycle waste.

Improving Environmental Quality through Cooperation between the Government, the Municipalities and Enterprises & Boosting International Cooperation

The Establishment of an Integrated Institutional Mechanism for Pursuing Environmental Policy to Improve National Environmental Sustainability

Following eco-friendly procedures in our day-to-day lives and exhibiting eco-friendly behavior are important in sustaining the national environment. Therefore, what is important is to implement an integrated environmental policy in order to put in place eco-friendly management in all aspects of the Korean society.

To this end, the Ministry developed an assessment and feedback policy, aiming to achieve a high placing in the Environmental Index (EI) which evaluates national competitiveness in the environmental sector. A pilot test of major items in the EI was also conducted.

Moreover, the strategy for assessing environmental quality in all municipalities was developed through evaluation of how many action plans of Local Agenda 21 were reflected into administrative programs.

In addition, to promote eco-friendly corporate man-

agement and participation in policy making, a roadmap was formulated to encourage financial institutions to help companies establish a system for environmental quality assessment through "eco-friendly" loan management.

Public-private partnership was reinforced through the creation of an informal gathering of the Minister of Environment and CEOs and the reorganization of the existing corporate environment policy council into subcommittees.

At the same time, an institutional basis for promoting environmental education was expanded through drawing up relevant laws and forming eight regional environmental education policy councils. Training programs were provided to foster and manage human resources for environmental education. Continued efforts were made to institutionalize advanced environmental governance.

The Commercialization of Environmental Technology and a Reasonable Strategy for International Expansion of the Environmental Industry

Much effort was made to develop technology for restoring aquatic ecosystems, convert waste to resource energy, and reduce non-CO₂ greenhouse gases. A total of KRW 130 billion was allotted to the Eco-STAR Project over six and a half years, so as to maximize the possibility of success in technology development.

Active support was provided to less developed sectors in the Technology Road Map for the success of the third stage of the comprehensive 10 year plan from 2008 to 2010.

12 categories by source of pollution were regrouped into five sectors by the objective to enhance business results. Additionally, to foster the environmental industry and boost its competitiveness, the Ministry has established a center for supporting the export of Korea's environmental expertise, aiming to build an environmental industry information network, manage a human resources network, and provide one-stop

service for international expansion of the environmental industry.

In furtherance to this, an integrated system for supporting and coordinating the entry of the environmental industry into overseas markets has been launched, through the expansion of a "supporting group for environmental industry development."

Moreover, the Standard Industrial Classification (SIC) has been improved to boost competitiveness of the environmental industry, with the enhancement of the quality of environmental consulting service.

To expand markets for the production and consumption of eco-products, a pilot project has been conducted to build stalls for eco-products in large stores (e.g., department stores) and special shops, so as to increase access to eco-products.

The conclusion of green purchase agreements with the religious sector was pursued, facilitating an increase in the purchase and consumption of eco-products.

Boosting International Environmental Cooperation & Responding to Discussions linking the Environment with Trade

Much effort has been made to strengthen regional cooperation in terms of the environment. The Ministry has promoted environmental cooperation in Northeast Asia through the participation in the 9th Tripartite Environment Ministers Meeting and the 15th Northeast Asian Conference on Environmental Cooperation (NEAC).

It also has sought ways to cooperate with Egypt and EU in the environmental field. In addition, the Ministry

has actively responded to international environmental agreements. It has prepared the Convention on Wetlands of International Importance for its 10th Meeting of the Conference of the Contracting Parties (CoP), to be held in Korea in 2008.

It also proceeded toward the designation of the Antarctic Special Protection Area in accordance with the Protocol to the Antarctic Treaty on Environmental Protection.

For strategic response to international environment/trade negotiations, the Ministry has expanded environmental cooperation including the conclusion of environmental agreements in accordance with the Free Trade Agreement. Support was granted to companies in

preparation for global environmental regulations, and strong environmental cooperation with international organizations such as the United Nations Environment Programme (UNEP) was undertaken.

Addressing Climate Change and Long-Range Transboundary Air Pollution

The Ministry has focused on effectively reducing greenhouse gases by adopting measures to address climate change. It provided assistance to 169 environmentally-friendly companies so that they could build an emission control system for voluntary reduction of greenhouse gases.

Moreover, to enhance our negotiation capabilities for addressing climate change, the Ministry hosted a workshop with climate change experts and public officers, so as to discuss a Greenhouse Gas (GHG) reduction target of the Fourth comprehensive Measure to address climate change.

It also actively attended programs for multilateral international cooperation. Concurrently, the Ministry revised the Clean Air Conservation Act, which became a legal basis for formulating a "Dust and Sandstorms

(DSS) countermeasure commission" and a "comprehensive measure for preventing damage by DSS.

Stations which detect and measure hazardous substances in dust and sandstorms were built to conduct research on the risk assessment of particulate matters and other harmful substances.

Furthermore, Korea, China, and Japan set plans to carry out a joint study to measure the amount of long-range transboundary air pollutants (especially, sulfur and nitrogen) in Northeast Asia.

The Status of Environment in Korea

- Nature
- Air
- Water
- Soil & Groundwater
- Wastes & Recycling
- Toxics & Chemicals
- International Environmental Cooperation

The Status of Environment in Korea

Nature

Conditions and Prospects

In Korea, as of the end of 2005, non-urban land including forest (65.0%), farming land (21.3%), rivers and streams (7.5%) accounted for 93.8% of the total land, covering 99,646^{km²}. On the other hand, there is a shortage of urban land which includes lots for housing and building (2.5%), for plants (0.6%), as well as public lots for schools and roads (3.0%, 6,101^{km²}).

This indicates that there is an urgent need for land development which focuses on expanding usable land. The 2005 population survey results from the Korea National Statistical Office show that the current population of 48.082 million, as of late 2004, will

increase to 49.956 million in 2020.

This increase will raise demand for urban land to 9.1% of the total land, and concurrently there will be an additional need for urban land covering 3,848^{km²}. Land development is unavoidable, but sustainable development, which seeks the harmony of land development and conservation, is the most important.

The objectives of environmental conservation policy can be summarized by "a live community where mankind lives in harmony with nature." Major tasks to achieve these objectives are as follows:

Conservation of the Baekdu-Daegan Mountain System

The Baekdu Daegan ridge stretches the length of the Korean peninsula and includes most of its highest peaks. It holds great national and ecological importance for the Korean people as the provider of life, energy sources and water for the peninsula and as a treasure trove of biodiversity.

Firstly, the Baekdu Daegan is a key habitat and ecological bridge for wildlife on the Korean peninsula. It is covered with old growth forest (more than 20 years-old), with excellently conserved ecosystems, which serve as food sources for wildlife. Secondly, the

Baekdu Daegan boasts a great diversity of species. Out of 1,528 wildlife species (123 mammals, 457 birds, 43 amphibians/reptiles, and 905 fishes) known to live in the Korean peninsula, most of species are living in the Baekdu Daegan except for some indigenous species (e.g., *Crocidura russula quclpartis*, *Micromys minutus hertigi*, etc.) on Jeju island.

For this reason, the Baekdu Daegan provides important habits and breeding sites for wildlife on the Korean peninsula. Thirdly, the Baekdu Daegan has excellent conservation value, in terms of its ecologi-

cal/geographical characteristics. It has distinct species compositions - coniferous forests in subpolar zones, and deciduous forests in temperate zones - according to differences in altitudes and temperature. Floral

zones in the North and the South are interlaced due to geographical features of the Baekdu Daegan. Therefore, the Baekdu Daegan can be used as a habitat indicator.

[Table 13] The Baekdu Daegan

(Unit : km²%)

Classification	Total		Core region	% (Core/Total)	Buffer Zone	% (B.Z./Total)
	Area	%				
Total	2,634	100.0	1,699	65	935	35
Gangwon	1,339	50.8	941	70	398	30
Chungcheong	356	13.5	120	34	236	66
North Jeolla	179	6.8	143	80	36	20
Sough Jeolla	52	2.0	34	65	18	35
North Kyungsang	478	18.2	320	67	158	33
South Kyungsang	230	8.7	141	61	89	39

- Date of Designation : September 9, 2005
- Legal Framework : Article 6 of Act on the Protection of Baekdu Daegan Mountain System
- Area : 2,634km² (Core Area: 1,699 km² (65%), Buffer Zones: 935km² (35%))
- Location : The peak of Hyang-Ro (in Gosung, Gangwon Province), the Cheonwang Peak of Mt. Jiri (in Sanchung, South Kyungsang Province)
- Ownership : Public (86.8%), Private (13.2%)
- Current Status of Land Use : Forest/Fields (99.6%), Ranches (0.13%), Roads (0.16%), Farm (0.1%)
- Range : 6 Provinces, 32 Cities/Counties(Gun)(12 cities, 20 counties), 103 Towns(Eup/Myeon/Dong)
- * 7 National Parks and Two Provincial Parks Included.

Conservation of the Ecosystem of the DMZ District

The Demilitarized Zone (DMZ) District, Civilian Control Zone, have been restricted for security reasons since the end of the Korean War. With no human intervention, biodiversity in the area has been so well-preserved. But recently concerns have been raised over environmental degradation in the DMZ District, as demand for developing said areas has been growing in line with increased inter-Korean exchanges and cooperation.

The enactment of the Border Area Support Act in January 2000 and the implementation of "Comprehensive Measures for the Ecosystem Surrounding the DMZ District from 2003 to 2012."

For systematic conservation and management of aforementioned areas, the Korean government aims

to designate the DMZ District as one of the three core ecological pillars, divide existing conservation areas into three major zones on the basis of ecological research and eco-maps, as well as to promote and reinforce the EIA(Environmental Impact Assessment) and PERS(Prior Environmental Review System) of development projects in the DMZ District.

In particular, the government has proceeded toward the designation of the DMZ District with its unique natural assets as the UNESCO Biosphere reserve. The designation will help the aforementioned area to be managed and conserved as an ecological pillar linking the East and West of the Korean peninsula, and consequently make a great contribution to the establishment of a peaceful and ecological area.

Protection of Excellently Preserved Ecosystems

According to the Natural Environment Conservation Act, Eco-System/Landscape Conservation Areas are designated by the Minister of Environment (in the case of land) or the Minister of Maritime Affairs and Fisheries (in the case of oceans).

Municipal/Provincial Eco-System/Landscape Conservation Areas are designated by local governors as areas considered worthy of protection. As of the end of 2006, there are 30 Eco-System/Landscape Conservation Areas (e.g., the estuary of the Nakdong River) covering 352.039 including 16 Municipal /Provincial Eco-System/Landscape Conservation Areas (e.g, Mt. Baekwoon in Gwangyang) covering 38.945^{km²}.

The places within Eco-System/Landscape Conservation Areas, especially for protecting endangered wildlife and preventing ecological degradation, are designated and managed as Natural Ecology / Preservation Areas.

10 Areas (242.720^{km²}) including the estuary of the Nakdong River have been managed by the Minister of Environment, 4 Areas (70.373^{km²}) including Sindu-ri's coastal sand-dunes by the Minister of Maritime Affairs and Fisheries, and 16 Areas (38.945^{km²}) including Bam Islet in the Han River by local governors.

The number of Natural Eco-System/Landscape

Conservation Areas will be increased after collecting opinions from relevant government departments and municipalities.

Similarly, Wetland Conservation Areas are designated by the Minister of Environment or the Minister of Maritime Affairs and Fisheries, according to the Wetland Conservation Act.

As of the end of 2006, there are 12 Wetland Conservation Areas (e.g., the estuary of the Nakdong River) covering 107.109 km^2 which were designated by the Minister of Environment, and 6 Areas (e.g., Moan tidal flat) covering 144.228 km^2 , which were designated by the Minister of Maritime Affairs and Fisheries.

The number of Wetland Conservation Areas will also be increased after collecting opinions from relevant government departments and municipalities. The Special Act on the Ecosystem Conservation of small Islands, such as Dokdo Island, stipulates that special islands are defined as islands that are uninhabited or inhabited in some restricted areas.

They are designated by the Minister of Environment. Thus far, 153 islands with high ecological conservation value were designated as special islands. The number of special islands will continue to be increased after collecting opinions from relevant government departments and municipalities.

Conservation of National Bio-Resources & Protection of Wildlife

As the Convention on Biological Diversity (CBD) which was signed at the 1992 UN Conference on Environment and Development (UNCED) recognized, the 'sovereign right over biological resources,' approval should be gained from the chief of the River Basin Environmental Office when exporting biological resources designated by the Minister of Environment.

In accordance to this rule, 201 species (11 fishes (e.g., Korean rose bitterling) and 190 plants) were designated in April 2000 as those which need approval when being exported, and a total of 359 species (7 reptiles (e.g., lizard), 4 amphibians, 44 fishes, 54 insects, and

250 plants) were designated in January 2002.

With the implementation of the Wildlife Protection Act in February 2005, a further 333 species (1 reptile, 37 fishes, 53 insects, and 242 plants) were designated as those which need approval before export, except for existing endangered species. Moreover, a database for indigenous species has been built to protect and manage Korea's endemic species.

National Institute of Biological Resources was established in 2006 to collect and manage national biological resources in a systematic way.

[Table 14] Current Status of Biological Resources in Korea
(18,117 Animals, 8,271 Plants, 3,528 Others)

(As of Dec. 31, 2006)

Broad Classification		Narrow Classification		Species (No.)		Broad Classification		Narrow Classification		Species (No.)	
Animals (18,117)	Vertebrates (1,528)	Mammals		123		Higher Plants (4,662)	Monocotyledons		842		
		Fish		905			Dicotyledons		2,815		
		Amphibians/Reptiles		43			Pteridophytes · Gymnosperms		314		
		Birds*		457*			Bryophytes		691		
	Invertebrates I (3,564)	Sponges	204	Cinadarians	224	Plants (8,271)	Diatoms		1,512		
		Platyhelminthes	123	Rotiferans	159		Flagellates		316		
		Acanthocephala	1	Kamptozoans	1		Lower Plants (3,609)	Green Algae		1,064	
		Bryozoans	145	Clams	9			Stoneworts or Charophytes		27	
		sipunculidans	9	Mollusks	997			Sea Algae		690	
		Annelids	380	Tardigradans	49			Fungi(Lichens included)		1,625	
		Arthropods	1,028	Chaetognathans	39			Protozoans		736	
		Echinoderms	107	urochordatans	89			Procaryotes		1,167	
	Invertebrates II (13,025)	Insects		11,853		Others (3,528)					
Arachnids(Spiders)		1,172									

29,916 in Total (In case of Fungi being included in Others)

Furthermore, the government has designated endangered and protected wild fauna and flora and also substantially reinforced the penalties (up to 5 years in prison and a 30 million won fine) for the illegal capture or gathering of these species.

To conserve endangered wildlife and restore it

through artificial propagation, 12 organizations including Seoul Grand Park and Jeju Halla Arboretum were designated as ex-situ conservation agencies, as of late December 2006. The national budgets have been allocated to facilitate the conservation and restoration of endangered species since 2003.

[Table 15] Current Status of Designated Endangered Wild Fauna and Flora
(Animals : 156, Plants : 64, Others : 1)

(As of Dec. 31, 2006)

Classification	Total	Category I	Category II
Total	221	50	171
Mammals	22	12	10
Birds	61	13	48
Amphibians/Reptiles	6	1	5
Fish	18	6	12
Insects	20	5	15
Invertebrates	29	5	24
Plants	64	8	56
Sea Algae	1	-	1

- Category I : a species facing imminent extirpation or extinction because of a decrease in the population by a variety of human and natural factors

- Category II : a species likely to become endangered because of a decrease in the population by a variety of human and natural factors

To fully eliminate poaching, the government has installed a poaching prevention task force in the Ministry of Environment, so as to organize a private poaching control group. The government also has placed poaching rangers in local environmental offices, cities and provinces, to reinforce anti-poaching operations.

As a result, 678 cases of illegal poaching were detected and punished in 2006. Additionally, the government collected poaching equipment, jointly with civic groups, so as to find more than 15,000 traps and snares in hills and mountains nationwide.

[Table 16] Current Status of Yearly Control of Poaching/Illegal Trade in Wildlife

(No., as of Dec. 31, 2006)

Year	Total	Poaching	Illegal Trade	Illegal Sale of Hunting Rifles	Illegal Trade in Stuffed Animals	Others
2001	1,401	1,166	86	16	3	130
2002	1,033	876	38	13	3	103
2003	808	659	14	7	-	128
2004	762	653	13	2	-	94
2005	603	540	7	2	-	54
2006	678	580	3	5	2	88

Natural Park Management

As of the end of 2006, Korea has a total of 76 natural parks (20 national parks, 23 provincial parks, and 33 county parks) covering an area of 7,805 km² which accounts for 7.8% of the total land.

[Table 17] Current Status of Designation of Natural Parks

(km², as of Dec. 31, 2006)

Total	Total	National Parks	Provincial Parks	Country Parks
Number	76	20	23	33
Area (km ²)	7,805	6,580	784	441

"Special protection zones" are designated to protect important animals and plants, especially endangered species, in national parks.

For example, a 'species restoration project for the Asiatic black bear' has been implemented to propagate the existing population of wild Asiatic black bears to a Minimum Viable Population (MVP: 50 individuals or more) through immigration and Individual Management (IM).

A "national park special protection zone" (previously called the temporary closure program) has been designated to protect rare species of animals and plants and restore access roads severely damaged by too many visitors.

This has proven to be effective in restoring vegetation surrounding the zones. Therefore, the zone designations will be increased in 2007 to 54 sites in 12 parks.

[Table 18] Current Status of Implementation of Rest-Year System

(km², as of Dec. 31, 2006)

Classification		Total	Implemented in 2006	Newly Implemented in 2007	Remark
Sites		54	33	21	
Scale	Area(km ²)	209.35	168.74	40.61	
	Distance(km)	41.9	32.4	9.5	

Air

The air quality conservation policy aims to maintain a clean and sound air quality, so as to protect the public health and enable people to enjoy a comfortable environment.

To this end, the Ministry has developed and implemented diverse policies for air quality improvement such as setting air quality standards and encouraging businesses that emit air pollutants to comply with emission standards

[Table 19] Air Quality Standards (Implemented since Jan. 1, 2007)

Category	Standard	Methodology
Sulfur dioxide (SO ₂)	<ul style="list-style-type: none"> • 0.02 ppm or less/Yearly Average • 0.05 ppm or less/24-Hr Average • 0.15 ppm or less/1-Hr Average 	Pulse U.V.Fluorescence Method
Carbon Monoxide (CO)	<ul style="list-style-type: none"> • 9 ppm or less/8-Hr Average • 25 ppm or less/1-Hr Average 	Non-Dispersive Infrared Method
Nitrogen Dioxide (NO ₂)	<ul style="list-style-type: none"> • 0.03 ppm or less/Yearly Average • 0.06 ppm or less/24-Hr Average • 0.1 ppm or less/1-Hr Average 	Chemiluminescent Method
Particulate Matters (PM-10)	<ul style="list-style-type: none"> • 50 $\mu\text{g}/\text{m}^3$ or less/Yearly Average • 100 $\mu\text{g}/\text{m}^3$ or less/24-Hr Average 	β -Ray Absorption Method
Ozone(O ₃)	<ul style="list-style-type: none"> • 0.06 ppm or less/8-Hr Average • 0.1 ppm or less/1-Hr Average 	U.V. Photometric Method
Lead(Pb)	<ul style="list-style-type: none"> • 0.5 $\mu\text{g}/\text{m}^3$ or less/Yearly Average 	Atomic Absorption Spectrophotometry
Benzene	<ul style="list-style-type: none"> • 5 $\mu\text{g}/\text{m}^3$ or less/Yearly Average (To be applied in 2010) 	Gas Chromatography

Note. 1. 1-hour average: when converting the entire number of measurements into 1,000, the 999th percentile value should be less than the standard.
8-hour and 24-hour averages : when converting the entire number of measurements into 100, the 99th percentile value should be less than the standard.

2. PM10 Refers to Particulate Matter for which the size is 10 μm or less

Pollution Level

SO₂ Level

[Table 20] Sulfur Dioxide (SO₂) Levels in Major Cities

(Unit : ppm)

Year	City	Seoul	Busan	Daegu	Incheon	Gwangju	Daejeon	Ulsan
1992		0.035	0.033	0.040	0.036	0.017	0.022	0.031
1993		0.023	0.028	0.035	0.021	0.014	0.020	0.032
1994		0.019	0.023	0.038	0.022	0.013	0.021	0.030
1995		0.017	0.023	0.031	0.023	0.010	0.017	0.028
1996		0.013	0.022	0.023	0.012	0.008	0.015	0.022
1997		0.011	0.018	0.016	0.013	0.009	0.011	0.019
1998		0.008	0.016	0.014	0.009	0.008	0.009	0.015
1999		0.007	0.014	0.011	0.008	0.007	0.009	0.017
2000		0.006	0.010	0.009	0.008	0.006	0.007	0.013
2001		0.005	0.008	0.008	0.007	0.004	0.006	0.012
2002		0.005	0.007	0.006	0.006	0.004	0.004	0.010
2003		0.005	0.006	0.006	0.007	0.004	0.004	0.011
2004		0.005	0.007	0.006	0.007	0.004	0.005	0.010
2005		0.005	0.006	0.006	0.007	0.004	0.005	0.008
2006		0.005	0.006	0.006	0.007	0.004	0.004	0.007

Table 20 shows that SO₂ levels before 1993 in major cities except for Seoul and Gwangju exceeded an annual environmental standard of 0.02ppm but have gradually declined since the mid 1990s due to the provision of low sulfur gas oil and the mandatory use of clean fuels.

In particular, SO₂ levels in Seoul slowly declined from the peak of 0.094ppm in 1980 to 0.062ppm in 1988 to

0.019ppm in 1994 and down to 0.005ppm in 2005. Most cities except for Seoul met the WHO recommended standard of 0.019ppm after 1997.

Notably, Ulsan city where large emitters are located, shows higher concentrations of SO₂ than other cities, but the overall average concentrations were 0.007ppm in 2006, lower than the environmental standard.

PM10 Level

[Table 21] PM10 Levels in Major Cities

(Unit : $\mu\text{g}/\text{m}^3$)

Year \ City	Seoul	Busan	Daegu	Incheon	Gwangju	Daejeon	Ulsan
1991	121	134	109	144	100	68	104
1992	97	113	119	103	104	52	102
1993	88	96	105	100	75	53	98
1994	78	97	93	93	64	58	99
1995	85(78)	93(73)	73(81)	93(76)	63(49)	69(63)	106(69)
1996	85(72)	89(76)	75(87)	86(67)	74(51)	63(63)	97(51)
1997	72(68)	84(68)	62(72)	86(70)	74(49)	67(69)	84(43)
1998	62(59)	74(67)	72(72)	81(57)	62(49)	64(58)	72(29)
1999	84(66)	44(65)	- (66)	- (53)	43(56)	- (55)	71(29)
2000	99(65)	- (62)	- (63)	- (53)	- (58)	- (51)	43(52)
2001	71	60	67	52	57	48	55
2002	76	69	71	57	52	53	54
2003	69	55	59	61	36	43	40
2004	61	60	58	62	46	49	50
2005	58	58	55	61	49	48	50
2006	60	59	54	68	55	49	52

※ Parentheses refer to PM10 levels; figures after 2001 refer to concentrations of PM10

PM10 had been on the rise since 1998 and has declined since 2002. This phenomenon is believed to be resulted from the Ministry's comprehensive policy

for air quality improvement.

In general, PM10 concentrations increase temporarily in spring due to yellow sand and low relative humidity.

Acid Rain

[Table 22] Rain Acidity in Major Cities

City \ Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Seoul	5.3	5.4	5.4	5.8	5.7	5.3	4.9	5.0	4.8	4.7	5.0	4.8	4.5	4.4	4.7
Busan	5.2	5.3	5.3	5.2	5.2	5.2	4.7	4.8	4.9	5.0	6.2	4.9	5.0	4.8	5.7
Daegu	5.6	5.5	5.6	5.7	5.6	5.8	5.4	5.6	5.8	6.0	5.6	4.8	5.3	5.3	5.5
Incheon	6.2	5.8	6.0	5.9	5.9	5.0	4.4	4.6	5.0	4.7	4.8	4.7	4.7	4.5	5.4
Gwangju	5.7	5.8	5.8	6.2	5.9	5.9	4.8	5.2	5.2	5.0	5.1	5.0	5.2	4.8	5.2
Daejeon	5.7	5.5	5.7	5.9	5.8	6.2	4.7	5.0	4.7	4.9	5.1	4.7	4.8	4.6	4.7

※ Arithmetic average values were used by 1997; weighted average values have been used since 1998.

Overall, the data show a surge in rain acidity (pH) in most cities since 1998. That is because of a change in acidity calculation, i.e., from arithmetic calculation by 1997 to weighted calculation since 1998.

Pollutants contained rainfalls affect the level of acidity. They are generated from near sources and also transported from remote areas. For this reason, the cause of acidity surge in specific areas or cities is not easily detected and found.

Other Air Pollutants Levels

[Table 23] Other Air Pollutants Levels (2004~2006)

(Unit : ppm)

Air Pollutants	NO ₂								O ₃							
	0.05/Year								0.06/8 Hr							
Environmental Standard																
City	2000	2001	2002	2003	2004	2005	2006	2000	2001	2002	2003	2004	2005	2006		
Seoul	0.035	0.037	0.036	0.038	0.037	0.034	0.036	0.017	0.015	0.014	0.014	0.014	0.017	0.018		
Busan	0.024	0.030	0.029	0.026	0.024	0.023	0.023	0.022	0.025	0.024	0.024	0.024	0.023	0.024		
Daegu	0.029	0.030	0.023	0.026	0.026	0.023	0.023	0.017	0.019	0.018	0.018	0.022	0.022	0.020		
Incheon	0.024	0.027	0.027	0.030	0.028	0.025	0.029	0.018	0.019	0.019	0.019	0.020	0.022	0.020		
Gwangju	0.020	0.026	0.021	0.019	0.019	0.021	0.024	0.018	0.019	0.016	0.016	0.022	0.022	0.021		
Daejeon	0.023	0.025	0.020	0.018	0.022	0.020	0.020	0.020	0.021	0.019	0.019	0.019	0.021	0.018		
Ulsan	0.020	0.022	0.019	0.016	0.022	0.024	0.022	0.018	0.020	0.021	0.021	0.022	0.022	0.021		

※ Note : The environmental standard for NO₂ : 0.03/Year since January 1, 2007

The frequency of ozone exceedance events is more meaningful, rather than changes in annual average ozone concentrations because exposure to high ozone concentrations during the short term poses a threat to humans.

The status of ozone exceedance events during a short term (0.1ppm/h), which is not described in Table

above, shows that exceedance events have been on the rise, from 343 exceedances at 49 stations nationwide in 1996 to 1,090 at 220 stations in 2006. This phenomenon is believed to result from an increase in the number of automobiles in Seoul and urban cities.



Water

Water Management in Public Water Areas

Water Quality in Four Major Rivers

Overall, water quality in four major rivers in South Korea has been improved since 1997, as a result of water management efforts made by the Ministry. Special measures for four major rivers have been implemented since 1998, so as to put in place the river basin management system (e.g., the Total Maximum Daily Load Management System), expand environ-

mental infrastructure, and reinforce the emission standard.

The water quality of the Han river, which is the water supply source of 20 million people in Seoul and metropolitan areas, is at a level of 1.2mg/L on average in 2006, similar to the previous year. Water sources of four major rivers are managed at the level of 1~2mg/L.

[Table 24] BOD Measurement Results of 4 Major Rivers

(Unit : mg/L)

Classification	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04	'05	'06
Han(Paldang)	1.3	1.4	1.5	1.5	1.5	1.4	1.3	1.4	1.3	1.3	1.1	1.2
Nakdong(Mulgeum)	5.1	4.8	4.2	3.0	2.8	2.7	3.0	2.6	2.1	2.6	2.6	2.7
Geum(Daechong)	1.2	1.5	1.2	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.1	1.1
Youngsan(Juam)	1.5	1.1	1.3	0.9	0.9	0.8	0.7	0.9	1.2	1.0	0.9	1.1

The Rate of Meeting Water Environmental Standard

All streams nationwide are classified into 194 sectors which set and operate target water quality (e.g., BOD levels). The rate of said streams which meet the standard was 35.6% in 2006, down by 6.7% compared to the previous year. That was because heavy rainfalls in summer and an increase of nonpoint pollution sources deteriorated water quality upstream and

downstream.

The overall rate of water quality standard achieved has been on the rise from 12.8% in 1991 to 27.8% in 2000 and to 35.6% in 2006. The individual rate of four major rivers is as follows: the Han river (42.3%), the Nakdong river (32.5%), the Geum river (36.8%), the Youngsan/Sumjin rivers (33.3%), and others (30.4%).

[Table 25] Rate of Meeting Environmental Standard of 4 Major Rivers

(Unit : %)

Watershed	2000	2001	2002	2003	2004	2005	2006
Nation	27.8 (54/194)	29.4 (57/194)	37.6 (73/194)	49.0 (95/194)	36.6 (71/194)	42.3 (82/194)	35.6 (69/194)
Han	38.5	42.3	53.8	57.7	53.8	53.8	42.3
Nakdong	20.0	22.5	32.5	55.0	32.5	45.0	32.5
Geum	34.2	26.3	31.6	44.7	34.2	44.7	36.8
Youngsan	8.3	25.0	25.0	41.7	16.7	16.7	25.0
Sumjin	16.7	16.7	33.3	33.3	16.7	16.7	50.0
Others	23.9	26.1	32.6	41.3	30.4	34.8	30.4

Environmental Standards for Water Quality and Aquatic Ecosystems








The Ministry has replaced the existing physico-chemical and organism-based environmental standard with new environmental standards that consider the effect of pollution on aquatic ecosystems in 2007.

Five grades in the existing category are adjusted and increased into seven grades. The table containing biological characteristics was introduced to enable the

public to easily understand the environmental standard.

Additionally, eight environmental standards were newly added for hazardous substances, which can pose a direct/indirect threat to the public health. The environmental standards for cadmium and lead were reinforced to twice the existing standard

[Table 26] Environmental Standards for Water Quality and Aqua-Ecosystems

Category	State (Character)	pH	Standard					
			BOD (mg/L)	SS (mg/L)	DO (mg/L)	Coliforms (No./100mL)		
						Total Coliforms	Fecal Coliforms	
Very Good	I a		6.5~8.5	≤1	≤25	≥7.5	≤50	≤10
Good	I b		6.5~8.5	≤2	≤25	≥5	≤500	≤100
Fairly Good	II		6.5~8.5	≤3	≤25	≥5	≤1,000	≤200
Fair	III		6.5~8.5	≤5	≤25	≥5	≤5,000	≤1,000
Fair-Poor	IV		6.0~8.5	≤8	≤100	≥2	-	-
Poor	V		6.0~8.5	≤10	No floating matters such as garbage	≥2	-	-
Very Poor	VI		-	≥10	-	<2	-	-

Current State and Features of Lakes

Currently in Korea, there are 18,797 lakes and marshes, most of which are agricultural reservoirs (17,573). The rest are man-made lakes that were formed when building dams. There are only five natural lakes.

The Ministry has set environmental standards for phosphorous and nitrogen, given various side effects of eutrophication. It has also set and are managing water quality grades, water quality targets and compliance periods for the forty lakes in the country. Most

lakes have grade II or III quality water.

Most water resources are man-made lakes that were formed when building dams. To address water pollution caused by algae, the Algae Prediction System has been introduced and implemented in major water resources since 1997. Algae incidents have been on the rise since 1994. A stepwise notice (Alert/ warning/ emergency) is issued according to the number of Cyanobacteria

Status of Water Supply Service

As of December 2006, 45.3 million (91.3% of the total population), in 1,060 water service areas (90 cities, 212 towns (Eup), 758 rural area myeons), benefit from waterworks.

The daily water supply per capita 346 ℓ in 2006, declining from 351 ℓ / person · day in 2005, and has shown a steady decrease since 2001. That is attribute to the installation of water-saving devices, water-saving campaigns, and the prevention of water leakage.

[Table 27] Status of Waterworks Supply

Classification	2001	2002	2003	2004	2005	2006
Total Population (10 ³ persons)	48,289	48,518	48,824	49,053	49,268	49,624
Population Benefiting from Waterworks (10 ³ persons)	42,402	43,021	43,633	44,187	44,671	45,303
Water Supply Rate (%)	87.8	88.7	89.4	90.1	90.7	91.3
Water Supply Amount (ℓ /person · day)	374	349	347	353	351	346

If we compare the supply ratio according to the size of the region, the supply rate for the seven special metropolitan/metropolitan area cities is 99.1%, 97.5% for city areas, 82.8% for towns, and 40.7% for rural area myeons.

[Table 28] Supply Ratio to Size of Regions

Classification	Total Population (10 ³ persons)	Population Benefiting from Waterworks (10 ³ persons)	Water Supply Rate(%)	Water Supply (10 ³ m ³ /day)	Water Supply Amount (ℓ /person · day)
Nation	49,624	45,303	91.3	15,667	346
Special Metropolitan/ Metropolitan Area Cities	23,164	22,950	99.1	7,590	331
City areas	17,537	17,105	97.5	6,211	363
Towns	3,841	3,179	82.8	1,866	356
Myeons	5,081	2,070	40.7		

Status of Sewerage Service

As of the end of 2006, the supply rate (registered population divided by the population in sewerage service regions) is 85.5%. The capacity of 344 sewage service facilities across the nation is 23.2 million tons per day.

[Table 29] Status and Trends : Sewerage Service

Classification	2001	2002	2003	2004	2005	2006
Total Population (10 ³ persons)	48,289	48,518	48,824	49,052	49,268	49,624
Population Served by Sewers (10 ³ persons)	35,369	36,760	38,449	39,924	41,157	42,450
Facilities (No.)	184	207	242	268	294	344
Supply Rate (%)	73.2	75.8	78.8	81.4	83.5	85.5
Daily Capacity (10 ³ t/day)	19,230	20,233	20,954	21,617	22,568	23,275

The total length of sewer pipelines was 91,098km, as of the end of 2006. 48,966km (53.7%) were combined sewer system pipelines, which simultaneously remove rain and sewage water, and 42,132km (46.3%) were separate sewer system pipelines that remove rain and sewage water separately.

[Table 30] Sewer Pipelines

(Unit : km)

Classification	2001	2002	2003	2004	2005	2006	
Expanded Plan	112,567	116,141	119,521	120,814	125,709	127,980	
Facility Extension	Total	71,839	75,859	78,605	82,215	85,755	91,098
	Combined	44,534	45,680	46,167	47,255	48,257	48,966
	Separate	27,305	30,179	32,438	34,959	37,498	42,132
Supply Rate (%)	63.8	65.3	65.8	68.1	68.2	71.2	

Soil & Groundwater

Soil

Currently, sixteen substances, including cadmium, copper, arsenic, mercury, oil, and solvents that are causes of soil contamination have been prescribed as soil contaminants and are subject to regulation.

For each of these substances, a "soil contamination precautionary level" for contamination has been set that indicates reason for concern about possible damage to human health or assets, or adverse effects on the viability of animal and plant life. And a "soil conta-

mination regulatory standard" for situations in which measures are needed beyond the precautionary level has been established.

The soil contamination precautionary level divides total land into two categories, according to the Cadastral Act and land use; a "Ga" zone has a relatively low potential for soil contamination such as rice paddies, fields and forest; and a "Na" zone has a relatively high potential including plant lots, road and railroad land.

[Table 31] Soil Contamination Precautionary Level and Regulatory Standard

(Unit : mg/kg)

Classification	Category	Cd	Cu	As	Hg	Pb	Cr ⁶⁺	Zn	Ni	F	OP	PCB	CN	Phenol	BTEX	TPH	TCE	PCE
Precautionary Level	A Area	1.5	50	6	4	100	4	300	40	400	10	-	2	4	-	500	8	4
	B Area	12	200	20	16	400	12	800	160	800	30	12	120	20	80	2,000	40	24
Regulatory Standard	A Area	4	125	15	10	300	10	700	100	800	-	-	5	10	-	1,200	20	10
	B Area	30	500	50	40	1,000	30	2,000	400	2,000	-	30	300	50	200	5,000	100	60

The Ministry established 250 stations nationwide in 1987 constituting the national soil monitoring network and started routine measurements. Starting in 1997, it expanded this to regional networks and by

2001 had established 4,500 stations. In 2006, it carried out a soil contamination investigation at 2,294 sites with 1,500 stations.

[Table 32] Results of Soil Pollution Investigation

Classification	2000	2001	2002	2003	2004	2005	2006
Total	4,494	4,500	3,545	3,605	3,683	3,902	3,794
Stations Tested (No.)	1,499	1,500	1,500	1,500	1,500	1,500	1,500
Sites Tested (No.)	2,995	3,000	2,045	2,105	2,183	2,402	2,294

As a result of operating the national soil monitoring network, it was found that the level of contamination was similar to that in 2005, as of the end of 2006, but that levels of As, Zn, Ni, and BTEX were rising slightly.

The density of heavy metals is similar to the natural content of domestic soil, but levels of Cu, As, and Pb were slightly higher. The pH ranged from 4.1~9.9, and the pH average was 6.7 (natural soil: 5.7).

[Table 33] Average Level of Soil Contamination:
Result From the Use of the National Soil Monitoring Network

(unit: mg/kg)

Classification	Cd	Cu	As	Hg	Pb	Cr ⁶⁺	Zn	Ni	F	OP	PCB	CN	Phenol	Oil		TCE	PCE
														BTEX	TPH		
Average Level in 2006	0.076	3.587	0.481	0.025	5.395	0.000	82.318	10.222	280.109	0.000	0.000	0.010	0.000	0.000	16.207	0.000	0.000
Average Level in 2005	0.078	3.768	0.167	0.016	6.162	0.000	77.317	9.587	260.665	0.000	0.000	0.012	0.000	0.021	5.153	0.000	0.009
A Level of concern (A Area)	1.5	50	6	4	100	4	300	40	400	10	-	2	4	-	-	8	4
Natural Content	0.040	0.48	0.089	0.085	3.06	0.09	54.27	17.28	-	-	-	-	-	-	-	-	-

1. The pH ranged from 4.1~9.9 in 2006 (pH Average: 6.7)
2. Natural content is the result of analyzing forest soil in Korea via the "Soil Contamination Process Test Method" (National Institute of Environment Research, Study of Assessment and establishment of Soil Contamination Standards (I), 2004)

The national average of contamination levels did not exceed soil contamination precautionary levels (based on a "Ga" area) and the average level of pollutants such as Cd, Cu, Pb were also around 1/10 of the precautionary levels.

The average level of As, Zn, Ni, F, Oil were from 1/2 to 1/5. In addition, organic phosphorus, PCB, PCE are below detectable levels and the pH showed a range of 3.1~12.8. However, in most regions it is close to pH 5.7, the pH level of natural soil.

Groundwater

The supply of water had thus far relied mostly on inland water. But surface water pollution, limitations on water supply due to the construction of dams, as well as the rise in water consumption have led to more underground water being used. As of the end of 2005, there are 1.27 million underground water facilities in use or under construction.

As of the end of 2005, the total use of groundwater was still only at 34.3% (3.72bil m³/year, except salt groundwater) of the development potential of our groundwater (10.85bil m³), which signifies that the value of groundwater as a alternative source of water is very high. A groundwater monitoring network has also been put in place to regularly update the status of water quality for groundwater and to monitor trends,

so that basic data for policy formulation can be assured.

As a result of the 2006 groundwater quality study which monitored 2,462 sites once or twice a year, of the 4,740 test samples, 299 (6.3%) did not meet water quality standards. In terms of which criteria were not met, they were general bacteria 31%, NO₃-N 23%, Cl- 12%, TCE 10%, and pH 9%.

The general bacteria criteria that are not being met, is mainly due to insufficient management of groundwater wells, and the case of NO₃-N is from sewage water and leachate infiltrating into the ground. In 2006, sites not meeting water quality standards increased by 1.5%, compared to the previous year (4.8%), which has been on the rise over the past five years.

[Table 34] Yearly Status of Exceeding Groundwater Quality Standards

Classification	2000	2001	2002	2003	2004	2005	2006
Total Sites Tested (A)	3,890	3,861	3,882	3,934	3,865	4,760	4,740
Sites Not Meeting Standards (B)	184	189	143	142	212	230	299
Ratio (B/A, %)	4.7	4.9	3.7	3.6	5.4	4.8	6.3

Wastes & Recycling

Status of Waste Generation

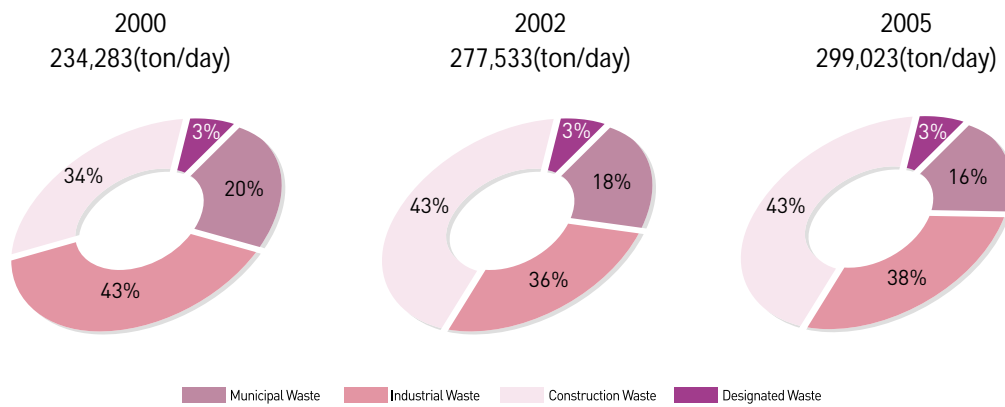
Total waste generation has shown an average annual increase of 8.6% over the past five years (1999-2004). But total waste generation in 2005 was 299,023 tons per day, decreased by about 4% compared to the previous year (311,666 tons/day)

Waste generated is composed of municipal waste

(16.2%), industrial waste (37.6%), and construction waste (43.3%) which has the largest portion of waste produced.

This ratio indicates that a dramatic increase in construction waste arose from an increase in construction and reconstruction and from the implementation of a waste reporting system.

[Figure 2]



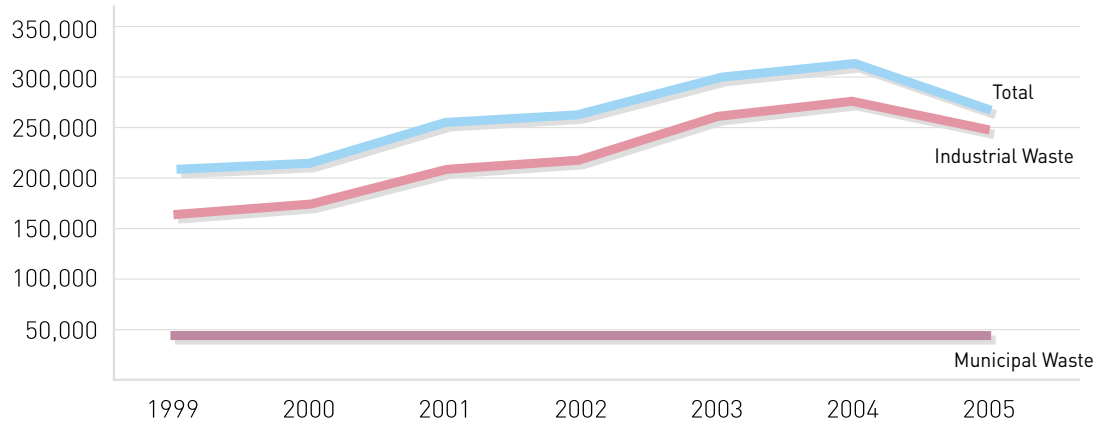
[Table 35] Trends in Waste Generation

(Unit : ton/day)

Classification		1999	2000	2001	2002	2003	2004	2005
Total		219,217	234,283	261,032	277,533	303,029	311,666	299,023
Municipal Waste		45,614 (0.97kg /person)	46,438 (0.98kg /person)	48,499 (1.01kg /person)	49,902 (1.04kg /person)	50,736 (1.05kg /person)	50,007 (1.03kg /person)	48,398 (0.99kg /person)
Industrial Waste	Subtotal	173,603	187,845	212,533	227,631	252,293	261,659	250,625
	General Industrial Waste	103,893	101,453	95,908	99,505	98,891	105,018	112,419
	Construction Waste	62,221	78,777	108,520	120,141	145,420	148,489	129,572
	Designated Waste	7,489	7,615	8,105	7,985	7,982	8,152	8,634

[Figure 3] Trends in Waste Generation

(Unit : ton/day)

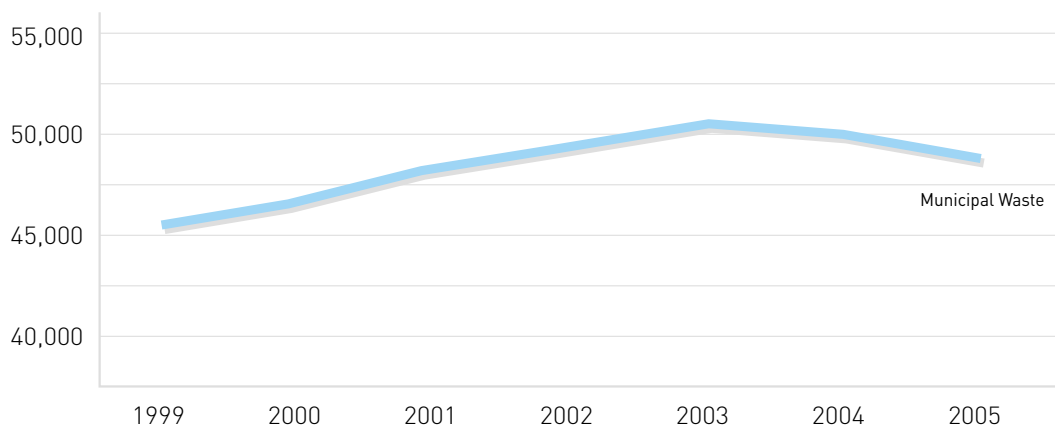


Municipal waste was expected to steadily go up due to a rapid increase in population and economic growth. But policies for controlling waste generation (e.g., reg-

ulations on disposable goods and a Volume-Based Waste Fee System) have led to a gradual reduction in the amount of waste.

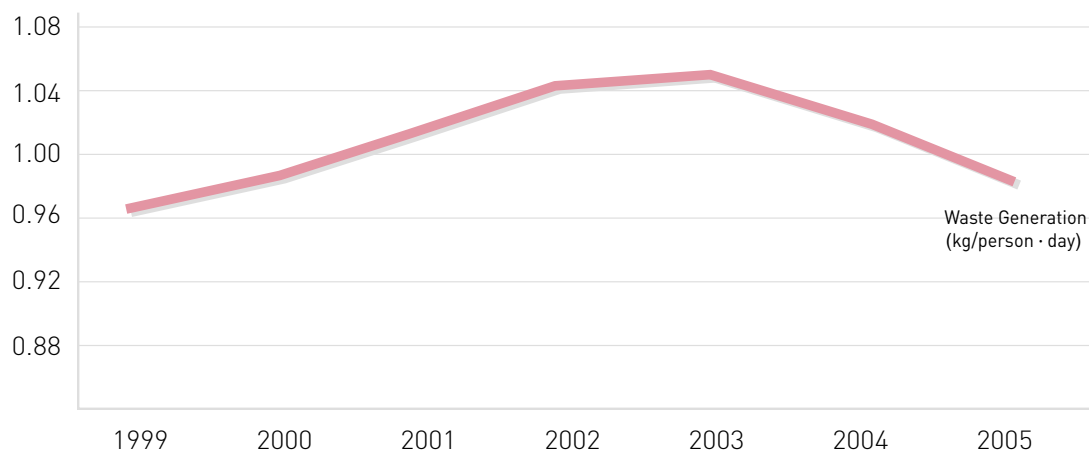
[Figure 4] Trends in Municipal Waste Generation

(Unit : ton/day)



[Figure 5] Trends in Municipal Waste Generation

(Unit : kg/person · day)

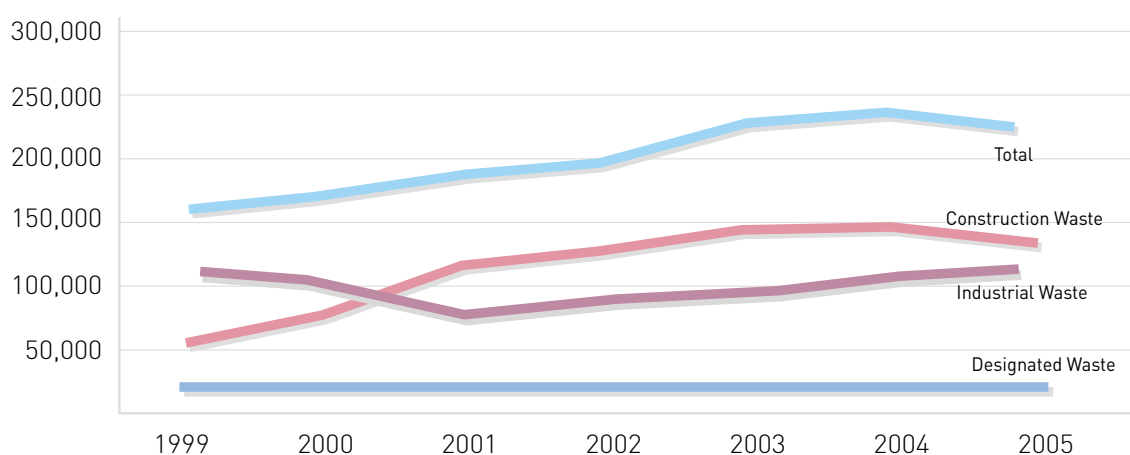


Industrial waste has increased an annual average of 10.4% over the past five years (1999-2004) because of an increase in industrial activities, the expansion of economic activities, and energy-intensive

industrial/economic structures. But industrial waste in 2005 recorded 250,625 tons per day, down 4.2% from the previous year

[Figure 6] Trends in Industrial Waste Generation

(Unit : ton/day)



Status of Waste Treatment and Disposal

In the case of municipal waste, the implementation of the "Volume-based Waste Fee System" has promoted waste separation and rapidly increased recycling, and on the other hand, the rate of incineration has gradually been on the rise.

The recycling rate has shown a steady increase to 56.3% in 2005. The rate of incineration has also increased to 16.0% in 2005 from 10.3% in 1999, whereas landfilling has continued to decline to 27.7% in 2005

[Table 36] Status of Municipal Waste Treatment

(Unit : ton/day)

Classification	1999	2000	2001	2002	2003	2004	2005
Generation	45,614	46,438	48,499	49,902	50,736	50,007	48,398
Landfilling	23,544	21,831	21,000	20,724	20,450	18,195	13,402
	(51.6%)	(47.0%)	(43.3%)	(41.5%)	(40.3%)	(36.4%)	(27.7%)
Incineration	4,676	5,441	6,577	7,229	7,348	7,224	7,753
	(10.3%)	(11.7%)	(13.6%)	(14.5%)	(14.5%)	(14.4%)	(16.0%)
Recycling	17,394	19,166	20,922	21,949	21,938	24,588	27,243
	(38.1%)	(41.3%)	(43.1%)	(44.0%)	(45.2%)	(49.2%)	(56.3%)

Separation of food waste from other waste has been put in place since direct landfilling was banned in January 2005.

For this reason, while food waste generation has been on the rise, the rate of recycling food waste as livestock feed and compost is at 93% as of 2005

[Table 37] Food Waste Generation and Treatment

Year	Generation	Recycling	Landfilling	Incineration
1999	11,577	3,928 (34%)	6,803 (59%)	846 (7%)
2000	11,434	5,161 (45%)	5,185 (45%)	1,088 (10%)
2001	11,237	6,378 (57%)	3,856 (34%)	1,003 (9%)
2002	11,397	7,130 (63%)	3,345 (29%)	922 (8%)
2003	11,398	7,718 (68%)	2,836 (25%)	844 (7%)
2004	11,464	9,316 (81%)	1,607 (14%)	541 (5%)
2005	12,977	12,105 (93%)	356 (3%)	516 (4%)

The rate of recycling industrial waste has been on the rise. As of 2005, of industrial wastes, 81.3% were recycled, 10% went to landfills, 4% were incinerated, and 4.7% were dumped at sea, etc.

In the case of industrial waste and construction waste,

their recycling rates are very high at 68.5% and 96.7%, respectively, because they are mostly single material items that can be recycled with ease. But they show low incineration rates, 6.5% and 0.7%, respectively.

[Table 38] Status of Industrial Waste Treatment

(Unit : ton/day)

Classification	1999	2000	2001	2002	2003	2004	2005
Total	173,603 (100)	187,845 (100)	212,533 (100)	227,631 (100)	252,293 (100)	261,659 (100)	250,625 (100)
Landfilling	30,574 (17.6)	29,904 (15.9)	32,677 (15.4)	34,303 (15.1)	29,377 (11.6)	26,043 (10.0)	21,431 (8.5)
Incineration	8,893 (5.1)	11,732 (6.2)	12,105 (5.7)	10,892 (4.8)	11,338 (4.5)	11,341 (4.3)	9,660 (3.9)
Recycling	125,990 (72.6)	138,031 (73.5)	158,842 (74.7)	172,323 (75.7)	200,830 (79.6)	212,728 (81.3)	207,557 (82.8)
Others (Dumping at Sea, etc)	8,146 (4.7)	8,178 (4.4)	8,909 (4.2)	10,113 (4.4)	10,748 (4.3)	11,547 (4.4)	11,977 (4.8)

The amount of industrial waste generation includes industrial waste, construction waste, and designated waste.



Status of Waste Recycling

Waste paper which takes a large portion of waste separation/collection is continuously increasing since a waste separation/collection system has been put in place through the implementation of the Volume-Based Waste Fee System.

The domestic use of waste paper is 75.4% in 2006, up 3.6% from 2005, whereas imports of waste paper are on the decline

[Table 39] Waste Paper Recycling

(Unit : 10³ ton)

Classification		2000	2001	2002	2003	2004	2005	2006
Paper Production		10,078	9,948	10,660	10,999	11,182	11,279	11,244
Paper Consumption(A)		8,366	8,521	9,339	9,965	9,909	9,868	9,889
Use of Materials	Total	10,398	10,316	10,540	10,897	11,479	11,436	11,599
	Pulp	3,213	3,108	2,943	2,955	3,082	2,935	2,932
	Subtotal	7,185	7,208	7,597	7,942	8,397	8,501	8,667
	Waste Paper							
	Domestic(B)	5,003	5,251	5,999	6,611	6,875	7,086	7,455
	Import	2,182	1,957	1,598	1,331	1,522	1,415	1,212
Use of Waste Paper (Domestic level)(B/A,%)		59.8	61.6	64.2	66.3	69.4	71.8	75.4

The use of scrap recorded about 24.2 million tons in 2006, 76.2% of this (18.49 million tons) was generated in Korea, and 23.8% (5.77million tons) was imported. The scrap use rate in Korea in 2006 was at 38.3%, a bit down from 2005.

[Table 40] Scrap Metal Recycling

(Unit : 10³ ton)

Classification		2000	2001	2002	2003	2004	2005	2006
Iron Material Consumption (A)		38,333	38,092	43,720	45,370	47,218	47,124	48,299
Use of Scrap Metal	Total	22,234	22,454	23,773	23,394	25,923	25,640	24,268
	Domestic(B)	15,369	15,726	16,550	17,160	18,375	18,825	18,490
	Import	6,865	6,728	7,223	6,234	7,548	6,816	5,778
Scrap Use Rate (Domestic Level) (B/A, %)		40.1	41.2	37.9	37.8	38.9	39.9	38.3

In the case of metal cans, 48.2% (159,000 tons) of 330,000 tons generated in 2006 were collected and recycled.

[Table 41] Metal Can Recycling

(Unit : 10³ ton)

Classification	2000	2001	2002	2003	2004	2005	2006
Generation	334	359	366	384	360	331	330
Recycling	211	180	168	195	159	146	159
Recycling Rate (%)	63.1	50.2	45.9	50.8	44.2	44.1	48.2

Separation of waste glass from other solid wastes has been expanded, and technologies for recycling waste glass have continued to be developed. In 2006, the use of waste glass was 531,000 tons, down from 567,000 tons in 2005.

[Table 42] Recycling of Waste Glass

(Unit : 10³ ton)

Classification	2000	2001	2002	2003	2004	2005	2006
Glass Bottle Consumption	731	738	794	756	760	776	749
Use of Waste Glass	492	504	587	530	544	567	531
Recycling Rate (%)	67.4	68.3	73.9	70.1	71.6	73.0	70.1

The Korean Tire Manufacturers Association has collected waste tires and provided them to recycling companies by using 27 collectors nationwide. 19.5 million (82.3%) of 23.689 million waste tires generated in 2006 were collected and recycled.

[Table 43] Waste Tire Recycling

(Unit : 10³ ton)

Classification	2000	2001	2002	2003	2004	2005	2006
Generation	19,596	16,919	24,023	23,233	776	24,202	23,689
Recycling	13,271	14,315	17,167	18,561	18,015	19,176	19,500
Recycling Rate (%)	67.7	84.6	71.5	79.9	80.3	79.2	82.3

224,194 tons of waste lubricant oil were generated in 2006. 146,499 tons (65.3%) of them were collected and recycled.

[Table 44] Waste Lubricant Oil Recycling

(Unit : 10³ ton)

Classification		2000	2001	2002	2003	2004	2005	2006
Generation (A)	Drum	1,044,910	1,010,925	1,144,850	1,170,110	1,198,720	1,198,720	1,120,970
	Ton	208,982	202,185	228,970	234,022	239,744	239,744	224,194
Recycling (B)	Drum	688,455	521,067	731,843	758,390	769,474	746,296	732,495
	Ton	137,691	104,213	146,369	151,678	153,895	149,259	146,499
Recycling Rate (B/A)		65.4	51.8	64.7	64.6	64.2	62.3	65.3

Toxics & Chemicals

According to the Toxic Chemicals Control Act, chemicals are divided into two groups, the existing chemicals and new chemicals.

The former includes 37,021 chemicals, designated and informed by the Minister of Environment after discussions with the Minister of Labor, which had been commercially used in Korea before February 2, 1991 and other 3,710 chemicals were designated and informed by the Minister of Environment through the hazard assessment process after February 2nd, 1991.

Management of the Existing Chemicals

Hazardous substances among the existing chemicals refer to toxic chemicals, observational chemicals, use restricted / banned chemicals, and accident precaution chemicals.

- Toxic Chemicals : 558 hazardous substances including formaldehyde, benzene, toluene
- Observational Chemicals : 21 substances with a potential hazard such as 4,4-bisphenol A

- Restricted Chemicals : Five substances including CCl₄, arsenic oxide (As₂O₅), malachite green
- Banned Chemicals : DDT, PCBs, benzidine, asbestos (except white asbestos), penta- /octa-BDEs
- Accident Precaution Chemicals : 56 substances such as phosgene, benzene, and benzoyl chloride (including 36 substances designated among toxic chemicals) with a high accident risk or the huge potential damage if the accident occurs

Hazardous Substance Management

Anyone who intends to handle toxic chemicals (including manufacturing, transportation, sale, use and storage of toxic substances) must register with local authorities.

The import of toxic chemicals must go through the process of declaration to the Korea Chemicals Management Association. Handling observational chemicals is not subject to regulation. These chemicals can be manufactured and imported, only with declaration to the Association. Handling and importing of restricted chemicals must go through the process of obtaining a permit.

Exporting of such chemicals needs approval from River

Basin or Regional Environmental Offices. Distribution of banned chemicals is not allowed in Korea. Chemicals highly likely to cause accidents have been included in the revision of a relevant Act.

Anyone who tends to handle such chemicals in more than certain quantities must set up an emergency preparedness plan and submit it to the Mayor or the Chairperson of the Regional Environmental Office. If relevant facilities exist within the zone designated (e.g., a national industrial complex) in line with a presidential decree, local residents should be notified of their existence.

The Status of Distribution of Toxic Chemicals

Distribution of toxic chemicals has been continuously increasing annually, 32,294 tons in 2006, up 57.1% from 20,544 tons in 2000.

[Table 45] Distribution of Toxic Chemicals

(Unit : 10³ ton)

Classification	1998	1999	2000	2001	2002	2003	2004	2005	2006
Total(a+b)	19,611	19,985	20,554	21,159	24,446	25,833	31,058	31,788	32,294
Production(a)	15,269	16,409	16,566	17,616	20,806	21,791	26,688	26,103	27,017
Imports (b)	4,342	3,576	3,988	3,543	3,640	4,042	4,370	5,685	5,277

International Environmental Cooperation

Responding to Global Warming

Korea ranked 10th in the world in terms of CO₂ emissions (as of 2004, IEA) which have been on the rise, because of Korea's continued economic growth and an energy-intensive industrial structure. Among greenhouse gases, CO₂ emissions have increased to 88.5% in 2002 from 83.6% in 1990 (an annual rise of 5.7% since 1990). Methane emissions have shown an annual decrease of 4.2% due to a decline in farm lands and the implementation of waste reduction measures.

The ratio of methane emissions to other greenhouse gas emissions has dramatically dropped to 4.6% in 2002 from 13.9% in 1990. Greenhouse gases are believed to be emitted mainly from energy, industrial processes and waste sectors. Without a change in the

current energy-intensive industrial structure and without dramatic measures for cutting greenhouse gases, the upward trend in greenhouse gas emissions is expected to continue by 2020.

The Energy Economics Institute and the Korean Environment Institute assume that if emissions are cut 10% against the expected CO₂ emissions of 2020, KRW 3.4 trillion, or 0.29% of GDP, could be lost. On the other hand, a reduction of CO₂ emissions by 10% against 2010 levels could generate environmental co-benefits of USD 5.16 billion, because of the reduction in air pollutants, disease occurrence, death rates, and agricultural damage.

<State of CO₂ Emissions by Country>[Table 46] Korea Ranked 10th in CO₂ Emissions(Unit: Million CO₂ ton)

Classification	1990	2000	2001	2002	2003	2004	2005	Specific Gravity (%)
The World	20,711.3	23,439.2	23,630.8	24,101.8	24,983	26,583	27,136	100
Annex I Countries	13,574.1	13,740.7	13,730.2	13,789.8	14,066.07	14,179.26	14,183	52.27
OECD	11,033.7	12,479.7	12,462.4	12,554.0	12,794	12,911	12,910	47.58
1 U.S.	4,843.0	5,688	5,613.8	5,652.3	5,728.53	5,799.97	5,816.96	21.44
2 China	2,256	2,982.1	3,055.4	3,270.6	3,719.44	4,732.26	5,059.87	18.65
3 Russia	2,022.6	1,513.5	1,516.4	1,503.1	1,526.75	1,528.78	1,543.76	5.69
4 Japan	1,015.2	1,178.4	1,164.6	1,206.9	1,201.37	1,214.99	1,214.19	4.47
5 India	594.7	973.9	985.5	1,016.5	1,049.72	1,102.81	1,147.46	4.23
6 Germany	966.4	835.0	850.1	837.5	854.29	848.6	813.48	3.00
7 Canada	430.2	529.2	521.2	531.9	553.29	550.86	548.59	2.02
8 England	560.3	524.5	541.7	529.3	540.25	537.05	529.89	1.95
9 Italy	400.1	425.2	426.1	433.2	453.36	462.32	454.00	1.67
10 Korea	226.2	427.7	441.7	451.6	448.37	462.1	448.91	1.65
11 Iran	175.3	310.2	322	345.2	348.94	369.38	407.08	1.50
12 Mexico	292	362	360	365.2	374.25	373.68	389.42	1.44
13 France	352.7	375.8	384.3	377.1	389.55	386.92	388.38	1.43
14 Australia	259.7	329.2	341.9	342.9	347.13	354.36	376.78	1.39
15 Spain	206.5	279.9	287.3	303.4	313.24	329.77	341.75	1.26
16 Indonesia	138.7	273.4	293.9	303.2	318.08	336.32	340.98	1.26
17 South Africa	254.6	296.9	296.9	301.5	317.97	343.36	330.34	1.22
18 Brazil	192.4	303.3	310.3	309.3	302.85	323.32	329.28	1.21
19 Saudi Arabia	171.7	267.3	283	301	306.46	324.88	319.68	1.18
20 Ukraine	595.4	287.2	292.2	292.5	296.79	304.85	296.82	1.09

- The World includes sea/air bunkering.

- Source : IEA, CO₂ Emissions from Fuel Combustion 1971-2002, 2004 Edition

IEA, Key World Energy Statistics, 2005~2006

The Ministry has allotted 4.4 trillion won for 22 projects from 2005 to 2007. This includes building the infrastructure for a GHG trade system, development of next-generation environmental technology tackling climate change, expanding the supply of zero and low emission vehicles including hybrid electric vehicles, measuring greenhouse gas levels in the atmosphere, and monitoring ecological changes due to climate change.

As negotiations have begun in 2006 regarding a mandatory reduction in greenhouse gases after the Kyoto Protocol's first commitment period ends, South Korea has strengthened bilateral cooperation through the conclusion of MOUs with England, Canada and France, actively attended the Asian Pacific Partnership on Clean Development and Climate, and has joined the Methane to Markets Partnership (M2M) and the International Partnership for Hydrogen Economics (IPHE).

International Environmental Treaty

As global environmental problems have become a new issue in international society, various environmental treaties, which have a direct impact on each country's environmental policies and economic activities, have increased in number.

Protection of the Ozone Layer, the Montreal Protocol on Substances that Deplete the Ozone Layer, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the Convention on Biological Diversity, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, and the United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa.

There are about 220 international environmental treaties in the fields of air, water quality, waste and natural environment. Korea has signed 45 treaties including the United Nations Framework Convention on Climate Convention, the Vienna Convention for the

[Table 47] International Environmental Treaties & Treaties Signed by Korea

Classification	Total	Air & Climate	Freshwater Protection	Marine & Fishery	Nature & Biological Resources Protection	Nuclear Safety	Hazardous Substances & Waste	Others
Adoption	221	14	15	86	50	13	13	30
Effectuation	164	10	9	66	40	12	8	19
Signing	47	8	-	16	7	7	2	7

Regional Environmental Cooperation

Promoting Environmental Cooperation in Northeast Asia

The countries of Northeast Asia, Korea, China and Japan, share a common environment due to geographical proximity.

In addition, this region has shown rapid changes for continuous economic growth and improvement in living standards. Therefore joint efforts for environmental conservation among states are urgently called for.

According to this need, active promotion of multilateral environmental cooperation is taking place in Northeast Asia since the 1992 UN Commission of Sustainable Development. Initiatives include the Northeast Asian Conference on Environmental Cooperation (NEAC), the Northeast Asia Sub-regional Program on Environmental Cooperation (NEASPEC), and the ADB-GEF project on prevention and control of dust and sandstorms. In particular, since the Tripartite

Environment Ministers' Meeting among South Korea, China, and Japan was formed in 1999, it has played a pivotal role in promoting environmental cooperation in the region.

Environmental Cooperation With Southeast Asia

Southeast Asia is a region which requires a joint effort to conserve the environment because of the recent rapid industrialization and urbanization. To promote sustainable development in Asia, the Ministry has expanded environmental cooperation projects which aim to share knowledge and experiences between South Korea and ASEAN.

The Ministry has been boosting and furthering cooperation with Southeast Asia through holding or attending the ASEAN+3 Environmental Ministers' Meetings and the Korea-Vietnam Environmental Ministers' Meetings since 2000.



Best Environmental Polices

- A Project for the Establishment of the Environmental Impact Assessment Support System(EIASS)
- Measures for the Management of Non-point Pollution Source
- Fostering the Water Industry Through the Promotion of Water Circulation
- Operation of the Waste Manifest System, Allbaro
- The CDM Project Registration of Landfill Gas-Fueled Power Facility in Seoul Metropolitan Areas

Best Environmental Policies

A Project for the Establishment of the Environmental Impact Assessment Support System(EIASS)

The Environmental Impact Assessment Support System (EIASS) has contributed a great deal toward changing the existing paper-based administration into a computer-based administration.

The system intends to provide EIA information to the public, assessment agencies, public officers, and relevant businesses in order to improve the quality of public services and thereby reducing administrative costs through database sharing, and increasing efficiency in paperwork related to the EIA report.

This system was launched on May 1st 2006 through a series of process steps which included pre-feasibility studies conducted in 2002, EIA reports completed from 2004 to 2006 and post-EIA reports compiled into a database. In addition, the system contains a wealth of data on EIA.

Of 3,275 cases which were completed in discussions on EIA from 1981 to late 2006, 2,590 cases were compiled into a database.

Of the EIA reports discussed after 1998, EIA documents of 1,470 projects were made public, 455 post-EIA reports, as well as, 30 item reports (e.g., executive summaries in EIA documents, and data on environmental states and quality) are readily available in the system.

Moreover, the Geographic Information System (GIS) database was also established to provide information on locations of businesses subject to EIA, the results of the survey of animal and plants species, conservation areas, as well as on places for environmental quality measurement, so as to be used for the preparation of EIA reports.

It contains essential data on EIA laws and relevant academic reports and provides information in real-time on an ongoing EIA process and the person in charge of preparing the report.

It is the first time in the world that all EIA statements are managed in an integrated system to make information public. This system is expected to improve the public right to know, reinforce monitoring of assessment projects, allow assessment agencies and businesses to easily access the information necessary for the preparation of the EIA report, as well as to improve the quality of the report through comparison and competition with other environmental statements.

The system will also serve as a basis for the Strategic Environmental Assessment (SEA). The SEA is a support tool for systematic decision making processes aimed at sustainable development, integrating consideration of the economic and social impacts, together with the environmental impact in the process of high-level

administrative planning, carried out prior to beginning a development project.

The Environmental Impact Assessment Act will be revised to create a provision for a system to make the EIA report public automatically without any consent at

the time the statement is registered; and to use an internal portal system which allows the search of municipality EIA information in the existing electronic system; and thereby providing one-stop services to the general public and secure public trust on EIA policies and administrative authorities.

Measures for the Management of Non-Point Pollution Source

Non-point source pollution not only occurs at a variety of development sites but also in everyday surroundings including urban and industrialized areas, agricultural regions, farmlands, forests, roads, rivers and streams. This type of pollution is especially severe during heavy rainfall when there is direct inflow into water bodies.

The fact that nonpoint source pollution heavily fluctuates according to precipitation is a major cause of the difficulty in setting up management measures. In gen-

eral, point pollution originates from identifiable sources and is relatively easily controlled, which leads to high efficiency in the treatment process.

On the other hand, non-point pollution does not originate from a single source, or point, and is not easy to detect and control. Worse yet, the discharge of non-point pollutants heavily depends on the amount of rainfall, which causes the difficulty in the formulation of measures for quantitative management.

[Table 48] Comparison of Point Pollution Source & Non-Point Pollution Source

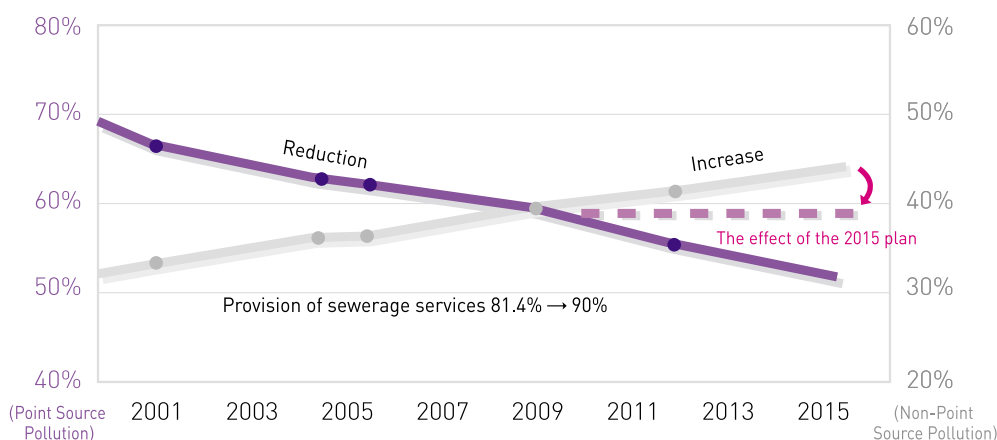
Classification	Point Pollution Source	Non-Point Pollution Source
Sources	plants, domestic wastewater, livestock, waste treatment, fisheries, livestock farms	paddy fields, forest and hills, housing / building lots, roads, air-borne pollutants
Features	<ul style="list-style-type: none"> - Artificial factors - Specified discharging locations - Intensively emitting from one point - Little effected by seasonal patterns and natural factors - Easy to collect, high efficiency in treatment 	<ul style="list-style-type: none"> - Artificial and natural factors - Unspecified discharging locations - Diluted and spread into broader areas - Much effected by seasonal patterns, and hard to predict - Difficult to collect, low efficiency in treatment due to rainfalls

The effect of nonpoint pollution sources on aquatic ecosystems can not be measured due to the aforementioned characteristics of non-point pollution sources.

However, pollutants originating from non-point

sources increased from 22~37% of the total pollutant load (BOD level) in the four major rivers in 2000 to 42~69% in 2003. Without proper measures, the proportion of non-point source pollutants is expected to rise significantly by the year 2015.

[Figure 7]



Point source pollution has been increasing as a result of industrial development, while its total pollutant load has gradually decreased on the back of the establishment of environmental facilities and the development and implementation of diverse measures for water quality improvement.

However, the discharge of nonpoint pollutants has been rising due to growing economic activities and land use, which have had a negative effect on water quality. As a result, the total pollution load of non-point sources has increased, compared to that of point sources.

Policies focused on point source pollution have shown its limitations in achieving water quality improvement, pointing out the need for an advanced and systematic management system for nonpoint source pollution.

To make a concentrated effort in the prevention of non-point source pollution, the Ministry of Environment formulated and implemented the "Comprehensive Measures for Water Management in Four Major Rivers" from 1998 to 2000, aiming to designate riparian zones, create buffer zones and urban reservoirs, restrict the use of agricultural fertilizers and pesticides, and convert livestock waste into energy resources.

For a systematic management of non-point source pollution, the "Comprehensive Measures for Non-point Source Pollution Management in the Four Major Rivers" were established in March 2004, under the leadership of the Prime Minister's Office and through the cooperation of related ministries.

These measures contained three major policy areas: firstly, the improvement of relevant institutions; secondly, pilot projects on the construction and management of non-point source pollution treatment facilities; and thirdly research and study of non-point source pollution and public relations.

Such areas of concern will be addressed over three phases: the first phase from 2004 to 2005 focused on the improvement of relevant policies and measures and the implementation of pilot projects; the second phase from 2006 to 2011 is concentrated on best-fit management projects for the four major river basins and the mandatory management of non-point source pollution.

The third phase from 2012 to 2020 will implement the nationwide management of non-point source pollution. In line with the aforementioned measures, the Water Quality Conservation Act was revised in March 2005 to set out the following: the shared responsibility of both central and local government authorities for non-point source pollution management; a mandatory establishment of facilities to reduce non-point source pollution; and the incorporation of the clauses on the management of non-point source pollution into 27 pieces of legislation and guidelines which stipulate the environmental impact assessment, city planning, and forest laws, so as to promote environmentally sound land use practices at the early planning stage

of new urban development and land use.

In addition, to develop standards for the design, operation and maintenance of non-point source pollution abatement facilities, pilot projects are being conducted in the four major rivers between 2004 and 2009. 25 facilities have been built at the Han river since 2004, and five at the Nakdong river since 2005.

Said facilities have been constructed at the Geum and Youngsan rivers since 2006. In furtherance to this, areas with the potential for significant threat to lakes/streams, ecosystems, and public health due to polluted runoff originating from non-point sources will be designated as a zone for the management of non-point source pollution.

If Comprehensive Measures for Non-point Source Pollution Management in the Four Major Rivers are driven forward as planned, it is expected that the amount of non-point pollutants will decrease by 34.3%, from a current 381 tons/day to 250 tons/day in 2020, so as to improve water quality in the four major watersheds to BOD levels of 0.20~0.65mg/L.

The Ministry will continue to cooperate with other government bodies to reduce non-point source pollution. In particular, a best-fit model for non-point source pollution at each small watershed will be developed and distributed; measures will be formulated for the management of muddy water originating from the occurrence of landslide around agricultural areas at high altitude; and control over non-point source pollution on roads and in urban areas will be reinforced to improve water circulation through the management of unaffected areas.

Fostering the Water Industry Through the Promotion of Water Circulation, Focusing on the Reuse of Treated Sewerage Water

South Korea has built large dams or reservoirs to secure water resources, but has faced the limit of this water policy due to concerns over environmental destruction and opposition from residents living in the areas to be submerged by dam building.

To develop new water resources and prepare for the possibility of water shortage, it is necessary to introduce a sustainable water circulation policy which aims to utilize rainwater, reusable wastewater, and treated sewerage water while reducing reliance on natural water resources.

Notably, advanced sewerage treatment methods have resulted in the creation of 6.4 billion tons per year of

quality water that is suitable for everyday life, industry, agriculture, and river maintenance flow.

For this reason, treated sewerage water has emerged as one of the best alternative water resources. In this vein, the Ministry decided to drive forward the promotion of the reuse of treated sewerage water as one of its major policies, expecting that the treated water will serve to relieve the imbalance of the regional water supply; improve water quality of rivers by reducing pollution load; boost corporate competitiveness by providing low-cost industrial water; and provide water front areas in urban streams.

Policy Process

To facilitate the reuse of treated sewerage water, the Sewerage Act was revised in March 2001 to incorporate the strategy for reusing treated sewerage water in the Framework for Sewerage Service Improvement.

A pilot project plan for promoting the reuse of treated sewerage water was developed in March 2005, to allocate the national budget and grant support to municipalities which intend to reuse said water.

Moreover, water quality recommendations were made in November 2005 to regulate the reuse of treated sewerage water for the intended purpose of everyday life, industry, agriculture, and river maintenance flow.

Furthermore, the Sewerage Act was revised in September 2006 to stipulate the mandatory reuse of a certain proportion of treated sewerage water when building a new sewerage treatment facility.

The Framework for Water Circulation was formulated in February 2007 to include the mid-to long-term goals, an implementation mechanism, financial support and tax credit, and the mid-to long-term road map for recycled sewerage water. As a follow-up measure, a bill regarding water circulation promotion was laid on the table of the National Assembly.

Status of the Reuse of Treated Sewerage Water

The reuse of treated sewerage water has been on the rise from 2.9% in 2000 to 5.4% in 2003 and to 7.7% in 2006. Of the total amount of treated water (6.41 billion tons), 490 million tons were reused in 2006, half of which was for cleaning, washing and cooling in treatment facilities and the remainder was for river maintenance and agriculture.

Since the pilot project for promoting the reuse of treated sewerage water has been implemented, 82,000 tons per day was used for the industry, daily life, agriculture, and river maintenance, at six sewerage treatment facilities from 2006 and 2008; and 86,000 tons per day will be used for river maintenance at another six facilities from 2007 to 2008.

However, the reuse of the aforementioned water has not been widely spread because of a potential presence of microbial pathogens such as bacteria or viruses in the recycled water, its unpleasant smell and color, a high initial cost for relevant facilities including supply pipes, and the remoteness of said facilities from urban areas.

Regarding the potential risk to humans and unwillingness to use the recycled water due to its smell and color, water quality recommendations were made for the reuse of treated sewerage water, which categorized the intended purposes of the reuse into six groups to stipulate water quality standards and analysis methods through a consulting expert.

In addition, to reduce a high initial investment cost, the government has supplied 30~70% (since 2006) of the total cost to the municipalities which are driving forward the reuse of the treated water. The revised Sewerage Act contained provisions on the mandatory reuse of the treated water in an effort to increase the proportion of the treated water that is used.

To widely spread the reuse of the treated water, the government will encourage municipalities to promote the reuse for river maintenance and agriculture, and on the other hand, induce the private sector to facilitate reuse for the industry and everyday life through tax credit and institutional improvement.



Future Plan for the Reuse of Treated Sewerage Water

The government will continue to allocate the national budget to the reuse of treated water and enact the Water Circulation Promotion Act by 2008. Additionally, a guide book for the reuse of the treated sewerage water will be published in 2007 to help municipalities and private businesses to promote the reuse.

The book will contain the method of reuse and information on the establishment and maintenance of relevant facilities, considering that the enactment of the

aforementioned Act will take a long time as the reuse of treated water is at an initial stage.

The policy for the reuse of treated sewerage water aims to provide the general public safe and good quality water at a low cost; and to reuse 1.24 billion tons of treated water per year by 2016 to create a market with a scale of USD 370 million and 2,500 new jobs, so as to develop the Third Water Market.

Operation of the Waste Manifest System, 'Allbaro'

The Waste Manifest System, "Allbaro" is a compound of the words "All" and "barometer", describing a waste system that deals with all waste and is sufficiently world-class to be a barometer of waste treatment to the rest of the world.

This waste manifest system is a comprehensive information system which allows individuals to access online the entire waste treatment process ranging from initial collection/transfer of industrial wastes, to their burning, crushing or other intermediate treatment to the final deposition in a landfill.

The operation of this system launched in 2003 led to a cost reduction of USD 38.5 million and a work time saving of 2.9 million hours by the year 2006. A total of 200,000 waste businesses will be subject to the mandatory operation of the waste manifest system in 2009, which is expected to save USD 133.6 million.

This system has been highly recognized for its excellence in the world, by applying the RFID (Radio Frequency Identification) technology to waste treatment. This technology has been benchmarked by Japan and will be transferred to Vietnam.

[Figure 8] Main Contents

Waste Handover System	input information on waste handover on the Internet and manage relevant databases
Waste Approval and Licensing System	make it possible to register and deal with the waste-related approvals and licensing through the waste manifest system.
Intelligent Online Analytical Processing (iOLAP) System	analyze information on waste handover in a systematic way
Disaster Recovery System	provide continued services in the event of natural disasters

The Waste Handover System

This is a brand new system allowing administrative bodies to check on all the processes of waste collection, transportation, and treatment in real time by the inputting of the relevant information on the Internet.

This system has made a contribution to the preven-

tion of abandoned waste and illegal treatment, the reduction of costs and personnel and thereby boosting competitiveness. The stepwise management system for all types of waste (including general and construction waste) has been completed as follows:



[Table 49]

Stage I (2001-2002)	Stage II (2003)	Stage III (2004)	Stage IV(2005)
Establishment and initial operation of the system	Expansion of the system	Expansion of electronic waste statistics management	Establishment of scientific statistics management
- Designated waste of 200 tons/year - General hospital	- Designated waste of 100kg/month - General hospital	- General waste - Hospitals and clinics - Designated waste general hospital	- Construction waste - Designated waste Above the level of hospitals - General waste
Approx. 1,500 business locations	Approx. 7,000	Approx. 20,000	Approx. 35,000
Establishment of handover system - digitalized waste handover copier form and its reporting	Establishment of the approval/licensing system - Application/ acceptance on the system Establishment of analysis system - Comparison analysis between approval/licensing information and handover data - Distract of information on management targets	Demonstrative operation of analysis of the approval/licensing system - Local environmental offices Establishment of the distributed processing system - Includes the function of disaster recovery center - Intelligent Online Analytical Processing (I-OLAP)	Expanded demonstrative operation of analysis of the approval/licensing system to 11 municipalities Establishment of an infectious waste management system using RFID

[Table 50] Status of the Registration and Use of the Handover Management System

Classification	2002	2003	2004	2005	2006	As of the End of May, 2007
Target Firms	1,476	7,382	19,146	33,956	34,882	33,440
Registered Firms (percentage)	1,476 (100%)	6,311 (86%)	11,061 (58%)	17,793 (52%)	19,497 (56%)	21,909 (66%)
Firms Using the System (percentage)	1,476 (100%)	3,733 (51%)	6,434 (34%)	7,841 (23%)	9,852 (28%)	10,798 (32%)
Target Waste	Designated Waste		Designated Waste, Industrial General waste	Designated Waste, Industrial General waste, Construction Waste		

Use of Electronic Handover Copier Forms

The use of electronic handover copier forms has been on the rise, which enables to check in real time on waste transportation information and to collect scientific statistical data.

※ 80,000 in 2002 → 250,000 in 2003 → 330,000 in 2004 → 460,000 in 2005 → 630,000 in 2006

[Table 51]

Classification	2002 (Sept.~Dec.)	2003 (Jan.~Dec.)	2004 (Jan.~Dec.)	2005 (Jan.~Dec.)	2006 (Jan.~Dec.)	2007 (Jan.~May)
Total (Monthly Average)	81,023 (20,255)	255,009 (21,250)	331,163 (27,597)	467,725 (38,977)	628,431 (52,369)	(70,715)
Designation	49,819	161,083	232,025	253,967	268,247	110,825

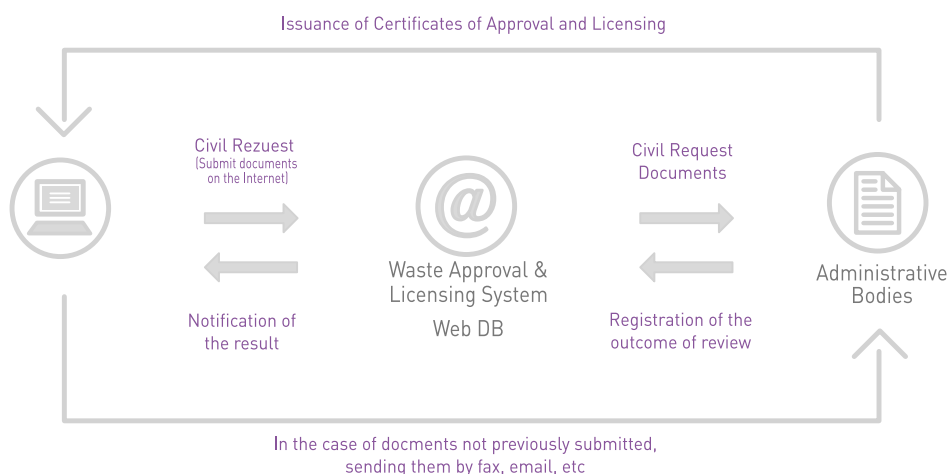
The Waste Approval and Licensing System

It is planned to make it possible to register and deal with the waste-related approvals and licensing through the waste manifest system. Under this system, a person in charge at regional environmental offices or municipalities reviews the application and then issues the certificate of waste approval/licensing

on the Internet.

This electronic system has contributed to boosting efficiency in approval/licensing work, saving work time through transferring diverse online documents required for approval and licensing, as well as establishing the scientific statistical database.

[Figure 9] System Flow Chart



This system was demonstrated in 2005, targeting all businesses under the jurisdiction of regional environmental

offices and has been put in place since 2006 to deal with civil requests related to waste permits and licensing.

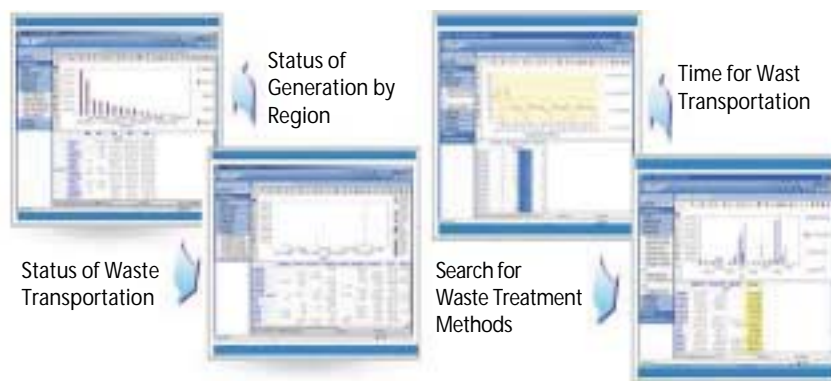
[Table 52]

Step I (Feb. 2004)	Step II (July 2004)	Step III (Dec. 2004)	Step IV (July 2005)	Step V (Jan. 2006)
Initial operation of the system	Expansion of operation	Expansion and stabilization of operation	Foundation for the expansion of operation and then smoothing operation	Smoothing operation
Jeonju Regional Environmental Office (200 in total)	Kyungin and Jeonju Regional Environmental Offices (4,000 in total)	Entire Environmental Offices (8,000 in total)	Entire Environmental Offices and 11 local authorities (12,000 in total)	Entire Environmental Offices and local authorities (100,000 in total)

The Intelligent Online Analytical Processing (iOLAP) System

The system aims to make diverse data graphics regarding the status of waste transportation and generation by region, and treatment methods on the basis of the waste handover information under the

waste manifest system and to analyze them in a multi-dimensional way to be used for the waste policy decision-making and formulation process.



The Disaster Recovery System (DRS)

In preparation for service disruptions due to network hindrance caused by natural disasters, a separate data repository is operated to store backup copies of critical data together with system backups etc. This repos-

itory serves as both a first level backup of systems and data, as well as a means to enable users access to that data in the event of a major disaster.



Advanced Waste Handover Management : An Infectious Waste Management System Using RFID

To protect the public health from highly risky hazardous and infectious waste, the RFID-based infectious waste management system has been developed.

Way Forward

The Ministry will expand the scope of the application of this system to reinforce the management of all PCB-containing waste and add an electronic tag to prevent the input of false information into the system and thereby thoroughly controlling all processes from the generation to the final disposal of waste.

The system will be applied to hazardous chemicals as the new European Chemicals regulation, REACH (Registration, Evaluation, Authorization and restriction

of Chemicals), was adopted. Additionally, South Korea's technology associated with the waste manifest system will be transferred to Vietnam.

The conclusion of the Memorandum of Understanding between South Korea and Japan on technological cooperation has promoted information exchange and will lay the foundation for the establishment of the proper management of importing/exporting waste.



The CDM Project Registration of 50MW Landfill Gas-Fueled Power Facility in Seoul Metropolitan Areas

Landfill sites in Seoul Metropolitan areas are grouped into four zones: the landfill operation was completed at the first site from 1992 to 2000, has been ongoing at the second site since 2000, and will be available at the third and fourth sites. Most of the landfill gases from the first and second sites were treated in centralized incinerators and small-scale incinerators.

The remaining gases were used for power generation at small-scale generators (9.88MW) and for cooling and heating. The statistics of the Sudokwon Landfill Site Management Corporation (SLC) shows that 87.2% of landfill gases collected as of 2005 were treated at the centralized incinerator and 12.8% were used for both cooling and heating.

The CDM (Clean Development Mechanism) project for landfill gas-to-energy aims to: firstly, maximize efficiency in gas capture/collection through the expansion of landfill gas capture facilities, so as to realize a stable landfill gas supply; secondly, use a landfill gas-to-power plant equipped with 50MW steam turbines to treat landfill gases in a more efficient way than the existing central and small-scale incinerators and 9.88MW power plants.

By doing so, the reduction in greenhouse gas emissions will amount to 12 million tons of carbon dioxide over the decade from 2007 to 2016.

History & Process

- Groundbreaking of the 50MW landfill gas-fueled power facility (March 2004)
- The development of the CDM project for landfill gas-to-energy (November 2005)
- Outsourcing contracts on the first-stage CDM project, registered at the UNFCCC (February 2006)
 - Contractors : Ecofrontier, Co., and Korea Power Engineering Company, Inc.
- The designation of DNV (Det Norske Veritas Certification Ltd) as the CDM operating authority; and launching of a feasibility study (May 2006)
- Posted at the website of the UNFCCC (June 13 - July 13) and public hearings (June 2006)
- Field visit of the CDM operating authority : July 2006
- Request for approval from the Designated National Authority (DNA), i.e., the Office of Government Policy Coordination (August 2006)
- Acquisition of a CDM certificate (November 2006)
- The completion of the 50MW landfill gas-fueled power facility (December 2006)
- The final confirmation of feasibility by the CDM operating authority and application for registration at the UNFCCC (February 2007)
- The completion of registration (April 2007)

Business Contents

Landfill Gas Capture/Collection Facility

The expansion of a landfill gas capture facility was completed in early 2004 at the first landfill site where the existing horizontal capture pipes and newly-built vertical pipes for the landfill gas-to-energy project are capturing and collecting landfill gases.

These vertical pipes at the second site are designed to

maximize the capture of landfill gases, and will dramatically increase the amount of said gases collected. Landfill gases captured go to the 50MW power plant and the remaining gases are provided to central incinerators and small-scale generators (9.88MW), especially when the 50MW plant is out of operation



< Landfill gas supply pipes >



< Central Incinerators >

The 50MW Power Plant

This plant consists of blowers for landfill gas supply, boilers, steam turbines, generators, and transmission lines.

[Table 53] Landfill Gas-to-Power Generation

Boiler	Steam Turbine	Transmission Line
<ul style="list-style-type: none"> - Steam Flow: 106.2t/hr - Steam Pressure : 100kg/cm² - Steam Temperature : 539°C - Efficiency : 82.4% 	<ul style="list-style-type: none"> - Rated Output: 50,000kw - Main Steam Temperature:536 °C - Main Steam Pressure: 95kg/cm² - Main Steam Flow:184,300kg/hr 	<ul style="list-style-type: none"> - Standard : 154kv,1Circuit, 240mm² Overhead line - Steel Tower : 29 - Extension : 7.615km - Linkage Point : KEPCO Keyang s/s



< The 50MW Power Plant >



< 9.88MW Power Plant >

Analysis and Application of Methodology

There are five landfill treatment methods approved by the UNFCCC, consisting of AM0002, AM0003, AM0010, AM0011, and ACM0001. ACM0001 is a consolidated baseline methodology for landfill gas project activities and created by an integration of the four previous methods.

These methods are used after considering their applic-

ability and the characteristics of target businesses. ACM0001 was applied to the Sudokwon Landfill Sites, setting the existing rate of landfill gas capture (approx. 42.8%) as a baseline and presenting the reduction in landfill gas emission not only through the increase in gas capture (approx. 70%) but also through the effects of shifting this waste into a new and renewable source of energy.

Expected Effect

The CDM project for landfill gas-to-power aims to expand and improve the existing landfill gas capture facility, so as to capture and collect more gases; to operate the 50MW power plant using said collected gases, so as to prevent odor and air pollution caused by landfill gases; and consequently will contribute to the generation of new and renewable sources of energy, less-

ening South Korea's dependence on overseas energy. Moreover, the reduction in greenhouse gases as the result of the current CDM project is the largest in scale among CDM projects registered in the landfill gas sector. Therefore, this project is expected to produce significant economic benefits when the emission trading system is put in place.

Way Forward

The Ministry will monitor the amount of greenhouse gases reduced by the CDM project for landfill gas-to-power; gain emission permits through the approval of the CDM operating entity; and set up a plan for using and operating emission permits.

In furtherance to these efforts, the Ministry will develop and implement a project for food waste leachate

treatment in Seoul metropolitan areas, a new CDM project for sewerage sludge-to-energy, and two additional projects for combustible waste treatment, including the Mechanical Biological Treatment (MBT) process used as a pre-treatment to stabilize residual wastes prior to landfilling and produce a high energy fuel, called RDF (Refuse Derived Fuel).

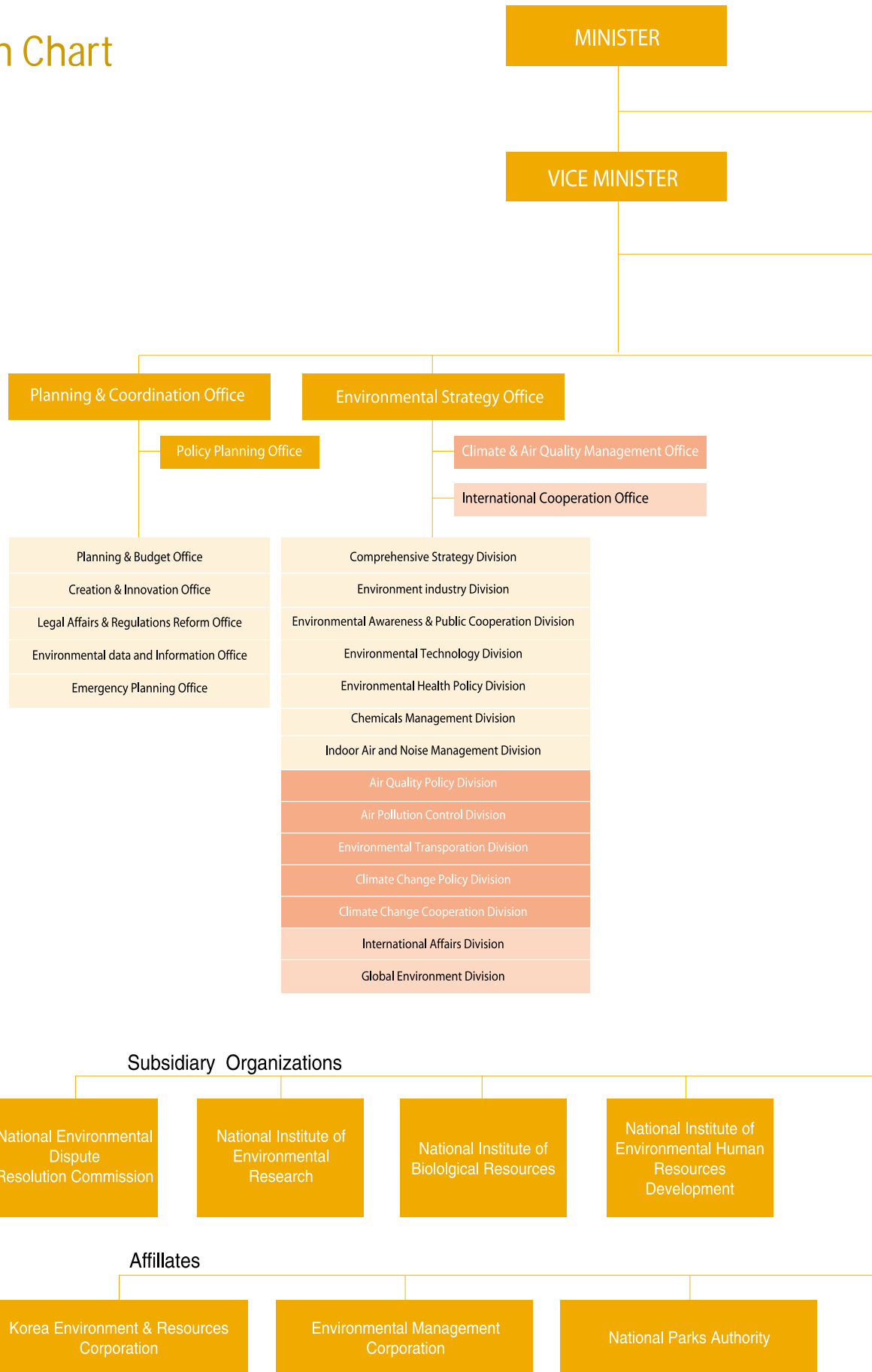




Appendix

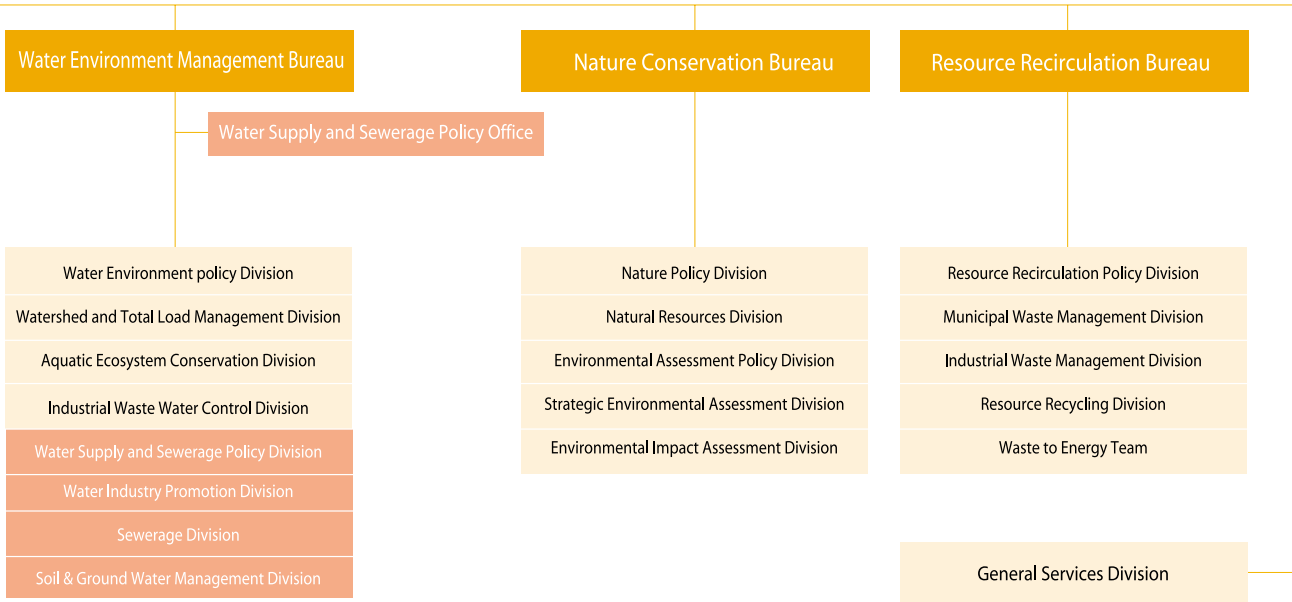
- Organization Chart
- Personnel
- 2008 Budget
- Head Office and Roles
- Contact Information and Websites of Subsidiary / Affiliated Organizations
- Environmental Laws
- Environmental Quality Standards
 - Air
 - Noise
 - Water & Aquatic Ecosystems
 - Drinking water
 - Discharge Water
 - Soil

Organization Chart



Office of Spokesperson — Policy Publicity Team

Office of the Inspector-General — Audit & Inspection Office
 — Environmental Inspection & Investigation Team



Personnel(1,759)

(as of December 2007)

Subsidiary Organization(1,270)													
MOE	NEDRC	NIER	NIBR	NIEHRD	River Basin Environmental Office(535)				Metropolitan Air Quality Management Office	Regional Environmental Office(231)			
					Han	Nakdong	Geum	Yeongsan		Wonju	Deagu	Jeonju	
489	21	297	102	27	147	147	116	125	57	76	99	56	

2008 Budget

(Unit : KRW100Million)

Category	Budget
Total	35,914
■ Business Expenses	34,280
· Water Supply/Sewage Services & Water Quality	21,274
- Water Supply/Sewage Services	17,958
- Water Quality	3,315
· Waste Management	2,872
· Air Quality Improvement	3,599
· Nature Conservation	2,778
· General Environmental Protection	3,757
- Environmental Policy	1,764
- International Cooperation	88
- Environmental Research / Education	378
- Environmental Management, etc	1,527
■ Labor Expenses/Basic Expenses	1,634

Head Office and Roles

Office / Bureau	Functions
Office of Spokesperson	<ul style="list-style-type: none"> • Establishment and coordination of public relation plans and strategies on major policies and support for public relation consultations • Management of public relation activities within a division and support for press conferences
Office of the Inspector General	<ul style="list-style-type: none"> • Audit & inspection issues and the inspection of MOE and its subsidiary organizations • Comprehensive coordination of investigation and regulation activities on pollutant emitting facilities
General Services Division	<ul style="list-style-type: none"> • Management of personnel, security, documents, and employee welfare • Purchase, procurement, management of goods, capital management, accounting, and settlement
Planning & Coordination Office	<ul style="list-style-type: none"> • Administrative innovation, the establishment of major task plans, budget allocation, and management of organizations and employees • Public service centers, the establishment and amendment of statutes, emergency plans, and environmental informatization, etc.
Environmental Strategy Office	<ul style="list-style-type: none"> • Formation of comprehensive mid-and long-term plans for environmental protection • Support for the development of environmental technology and industry • Environmental education and cooperation with private environmental organizations • Environmental health and control of toxic chemicals • Prevention of environment pollution in daily lives including indoor air quality, noise, and dust • Air quality improvement and the establishment of basic plans for the management of air quality in metropolitan areas • Establishment of comprehensive plans for the management of air-pollutant-emitting businesses • Measures to prevent automobile exhaust and to encourage the use of low-polluting fuel • Establishment of mid-and long-term plans to address climate change • International environmental cooperation and global environment conservation

Office / Bureau	Functions
Water Environment Management Bureau	<ul style="list-style-type: none"> • Formation of basic policies to preserve water quality • Establishment of water quality management plans for each watershed and related areas • Management of industrial wastewater, livestock waste, and non-point sources • Establishment of basic waterworks plans and implementation of measures to control water demand • Implementation of measures to nurture and support water industry • Establishment of framework plans on sewerage and household wastewater treatment • Formation of comprehensive measures to preserve soil and groundwater
Nature Conservation Bureau	<ul style="list-style-type: none"> • Development of basic policy for nature conservation • Conservation of ecosystem and management of national parks • Environmental Impact Assessment and Prior Environmental Performance Review
Resource Recirculation Bureau	<ul style="list-style-type: none"> • Establishment of framework plans and comprehensive measures for waste treatment • Development of framework plans for household and industrial waste management • Waste recycling and support for recycling industry • Formation of framework plans for waste recycling

Contact Information and Websites of Subsidiary/Affiliated Organizations

Organization	Telephone / Website
National Env' l Dispute Resolution Commission (NEDRC)	(82) 2-2110-6980 http://edc.me.go.kr/
National Institute of Environmental Research (NIER)	(82) 32-560-7714 http://nier.go.kr/
National Institute of Biological Resources	(82) 32-590-7000 http://nibr.go.kr/
National Institute of Environmental Human Resources Development(EHRE)	(82) 32-560-7751 http://ehrd.me.go.kr/
Han River Basin Environmental Office	(82) 31-790-2420 http://hg.me.go.kr/
Nakdong River Basin Environmental Office	(82) 55-211-1611 http://ndg.me.go.kr
Geum River Basin Environmental Office	(82) 42-865-0800 http://gg.me.go.kr/
Yeongsan River Basin Environmental Office	(82) 62-605-5114 http://yeongsan.me.go.kr
Metropolitan Air Quality Management Office	(82) 31-481-1312 http://mamo.me.go.kr
Wonju Regional Environmental Office	(82) 33-764-0982 http://wonju.me.go.kr
Daegu Regional Environmental Office	(82) 53-760-2502 http://daegu.me.go.kr
Jeonju Regional Environmental Office	(82) 63-270-1810 http://jeonju.me.go.kr
Korea Environment & Resources Corporation	(82) 32-560-1588 http://www.envico.or.kr
Environmental Management Corporation	(82) 32-560-2151~3 http://www.emc.or.kr/
National Parks Authority	(82) 2-3272-7931~3 http://www.npa.or.kr/
Sudokwon Landfill Site Management Corporation	(82) 32-562-2549 http://www.slc.or.kr
Korea Institute of Environmental Science & Technology	(82) 2-380-0500 http://www.kiest.org
Korea Eco-Products Institute	(82) 2-2085-0000 http://www.koeco.or.kr

Environmental Laws

(Total of 45 laws in effect)

Current Status	Enacted Date	Revised Date
Framework Act on Environmental Policy	Aug. 1, 1990	May 17, 2007
Clean Air Conservation Act	Aug. 1, 1990	Apr. 27, 2007
Framework Act on Sustainable Development	Aug. 3, 2007	Feb. 4, 2008 (Effective Date)
Indoor Air Quality Management Act	Dec. 30, 1996	Dec. 30, 2006
Noise & Vibration Control Act	Aug. 1, 1990	Apr. 11, 2007
Foul Odor Prevention Act	Feb. 9, 2004	Jan. 3, 2007
Special Act on Metropolitan Air Quality Improvement	Dec. 31, 2003	Jan. 26, 2007
Water Quality Conservation Act	Aug. 1, 1990	May. 17, 2007
Act Relating to the Han River Water Quality Improvement & Community Support	Feb. 8, 1999	Jan. 16, 2001
Act on the Nakdong River Watershed Management & Community Support	Jan. 14, 2002	Jan. 14, 2002
Act on the Geum River Watershed Management & Community Support	Jan. 14, 2002	Jan. 14, 2002
Act on the Yeongsan & Sumjin River Watershed Management & Community Support	Jan. 14, 2002	Jan. 14, 2002
Natural Environment Conservation Act	Dec. 31, 1991	May. 17, 2007
Act on Special Measures for the Control of Environmental Offenses	May. 31, 1991	Dec. 31, 1999
Environmental Dispute Adjustment Act	Aug. 1, 1990	May 11, 2007
Act on Antarctic Activities and Environmental Protection (jointly enacted)	Mar. 22, 2004	Mar. 22, 2004
Act on Promotion of the Purchase of Environment-Friendly Products	Dec. 31, 2004	Sept. 27, 2006
Act on Environmental Test and Examination	Oct. 4, 2006	Oct. 5, 2007 (Effective Date)
Environment Improvement Expenses Liability Act	Dec. 31, 1991	Jan. 3, 2007
Natural Park Act	Jan.4, 1980	Apr.11, 2007
Special Act on the Ecosystem Conservation of Small Islands such as Dokdo Island	Dec.31, 1997	May 17, 2007
Wetland Conservation Act (jointly enacted)	Feb.8, 1999	Apr.11, 2007
Act on the Assessment of Impacts of Works on Environment, Traffic, Disasters,etc. (jointly enacted)	Dec.31, 1999	May 17, 2007

Current Status	Enacted Date	Revised Date
Soil Environment Conservation Act	Jan.5, 1995	May 17, 2007
Act on the Protection of the Baekdu Daegan Mountain System (jointly enacted)	Dec.31, 2003	Jul.13, 2007
National Trust Act on Cultural Heritage & Natural Environment Assets (jointly enacted)	Mar.24, 2006	Mar.25, 2007 (Effective Date)
Wildlife Protection Act	Feb. 9, 2004	May 17, 2007
Environmental Management Corporation Act	May 21, 1983	Jan. 3, 2007
Act Relating to Special Accounting for Environmental Improvement	Jan. 5, 1994	Dec. 30, 2006
Development of & Support for Environmental Technology Act	Dec. 22, 1994	Jan. 3, 2007
Toxic Chemicals Control Act	Jan. 5, 1994	Dec. 31, 2004
Persistent Organic Pollutants (POPs) Control Act	Jan. 26, 2007	Jan. 27, 2008 (Effective Date)
Waste Control Act	Dec. 31, 1986	Apr. 11, 2007
Act on the Disposal of Sewage, Excreta & Livestock Wastewater (to be annulled)	Mar. 8, 1991	Sep. 28, 2007 (Annulment Date)
Act on the Management and Use of Livestock Manure (jointly enacted)	Sep. 27, 2006	Sep. 28, 2007 (Effective Date)
Act on the Promotion of Saving and Recycling of Resources	Dec. 8, 1992	May 11, 2007
Act on Resource Recycling of Electrical and Electronic Equipment and Vehicles (jointly enacted)	Apr. 27, 2007	Jan. 1, 2008 (Effective Date)
Act on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal	Dec. 8, 1992	May 17, 2007
Act on the Promotion of Construction Waste Recycling	Dec. 31, 2003	Dec. 28, 2006
Promotion of Installation of Waste Disposal Facilities and Assistance, etc. to Adjacent Areas Act	Jan. 5, 1995	Jan. 3, 2007
Sudokwon Landfill Site Management Corporation Act	Jan. 21, 2000	Jan. 21, 2000
Korea Environment & Resources Corporation Act	Dec. 27, 1993	Dec. 30, 2003
Sewerage Act	Aug. 3, 1966	Sept. 27, 2006
Water Supply & Waterworks Installation Act	Dec. 31, 1961	Apr. 11, 2007
Drinking Water Management Act	Jan. 5, 1995	Apr. 11, 2005

Environmental Quality Standards

Air

Air Pollutants	Standard	Measurement Method
Sulfur Dioxide (SO ₂)	≤0.02ppm (an annual average) ≤0.05ppm (24-hr average) ≤0.15ppm (1-hr average)	PulseUV.Fluorescence Method
Carbon Monoxide(CO)	≤9ppm (8-hr average) ≤25ppm (1-hr average)	Non-Dispersive Infrared Method
Nitrogen Dioxides (NO ₂)	≤0.03ppm (an annual average) ≤0.06ppm (24-hr average) ≤0.1ppm (1-hr average)	Chemiluminescent Method
Particulate Matters(PM10)	≤50 μg/ m ³ (an annual average) ≤100 μg/ m ³ (24-hr average)	β-Ray Absorption Method
Ozone(O ₃)	≤0.06ppm (8-hr average) ≤0.1ppm (1-hr average)	U.V. Photmetric Method
Lead(Pb)	≤0.5 μg/ m ³ (an annual average)	Atomic Absorption spectrophotometry
Benzene	≤5 μg/ m ³ (an annual average)(to be applied in 2010)	Gas Chromatography

Note : 1. 1-hour average: the 999th percentile value less than the standard

8-hour and 24-hour average: the 99th percentile value less than the standard

2. PM10 stands for Particulate Matter of less than 10 millionths of a metre (10 micrometers or 10 um) in diameter.

Noise

Region	Subjected Area	Standard	
		Day(06:00~22:00)	Night(22:00~06:00)
General Area	Exclusively Residential Zone	50	40
	General Residential Zone	55	45
	Commercial Zone	65	55
	Industrial Zone	70	65
Roadside Area	Residential Zone	65	55
	Commercial Zone	70	60
	Industrial Zone	75	70








Water & Aquatic Ecosystems

Rivers and Streams

- Standard for Human Health Protection(Rivers, Streams and Lakes)

Pollutants	Standard Value (mg/L)
Cadmium (Cd)	≤0.005
Arsenic (As)	≤0.05
Cyanide (CN)	Not Detected (Limit of Detection 0.01)
Mercury (Hg)	ND (LOD 0.001)
Organic Phosphorus	ND (LOD 0.0005)
poly-chlorinated biphenyls (PCB)	ND (LOD 0.0005)
Lead (Pb)	≤0.05
Hexachromium (Cr ⁶⁺)	≤0.05
Alkyl Benzene Sulfate (ABS)	≤0.5
Carbon tetrachloride (CCl ₄)	≤0.004
1,2-Dichloroethylene	≤0.03
Tetrachloroethylene (PCE)	≤0.04
Dichloroethylene	≤0.02
Benzene	≤0.01
Chloroform	≤0.08
Di-Ethylhexyl Phthalate (DEHP)	≤0.008
Antimony(Sb)	≤0.02

- Standard for the Living Environment

Grade	State (Character)	Standard					
		pH	BOD (mg/L)	SS (mg/L)	DO (mg/L)	Coliforms (No./100mL)	
						Total Coliforms	Fecal Coliforms
Very Good	I a 	6.5~8.5	≤1	≤25	≥7.5	≤50	≤10
Good	I b 	6.5~8.5	≤2	≤25	≥5.0	≤500	≤100
Fairly Good	II 	6.5~8.5	≤3	≤25	≥5.0	≤1,000	≤200
Fair	III 	6.5~8.5	≤5	≤25	≥5.0	≤5,000	≤1,000
Fairly Poor	IV 	6.0~8.5	≤8	≤100	≥2.0	-	-
Poor	V 	6.0~8.5	≤10	No floating matters such as garbage	≥2.0	-	-
Very Poor	VI 	-	> 10	-	< 2.0	-	-

Remarks 1. Water Quality by Grade & State of Aquatic Ecosystems

- a. Very Good : Higher concentrations of DO (Dissolved Oxygen), no pollutant, excellent condition of ecosystems, and residential use after a simple purification process (e.g., filtration and sterilization)
- b. Good : High DO levels, few pollutants, good condition of ecosystems, and residential use after a general purification process (e.g., sedimentation, filtration, and sterilization)
- c. Fairly Good : Good DO levels, a few pollutants, good and moderate condition of ecosystems, and residential/ swimming pool use after a general purification process (e.g., sedimentation, filtration, and sterilization)
- d. Fair : Moderate concentrations of DO, general pollutants, moderate condition of ecosystems, residential use after an advanced purification process (e.g., sedimentation, filtration, carbon block filtration, and sterilization) and industrial use after a general purification process
- e. Fairly Poor : Low concentrations of DO, many pollutants, an agricultural use, and an industrial purpose after an advanced purification process
- f. Poor : Lower concentrations of DO, a significant amount of pollutants, an industrial use after an advanced purification process (e.g., sedimentation, filtration, carbon block filtration, sterilization, and reverse osmosis), and no effect of bad or unpleasant odor on daily life
- g. Very Poor : Little DO, polluted water, and few fish to survive
- h. A certain grade of water can be used for lower-grade water purpose.
- i. An appropriate water treatment in line with the status of pollution by item (e.g., pH) and the method of water treatment, allows lower-grade water to be used for higher-grade water purpose.

– Water Quality By Grade & Biological Features of Aquatic Ecosystems








Grade	Biological Indicator Species		Habitats & Features
	Benthos	Fish	
Very Good ~ Good	Gammarus, Korean fresh water crayfish, <i>Drunella aculea</i> , <i>Cincticostella levanidovae</i> , Plecoptera, <i>Rhyacophila</i> , <i>Glossosoma KUa</i> , <i>Hydatophylax nigrovittatus</i> McLachlan, <i>Psilotreta kisoensis</i>	Trout, Moroco SP, Fresh Water Salmon, Chinese minnow, etc.	- Crystal clear water, and high flow velocity - Rocks and pebbles at the bottom - Very little attached algae
Good ~ Fair	Melanian snail, <i>Glossiphonia</i> , <i>Rhoenanthus</i> (<i>Potamanthindus</i>), <i>Ephemera Orientalis</i> , <i>Uracanthella rufa</i> , <i>Caenis nishinoae</i> , <i>Psephenoides</i> sp. 1, <i>Macronema radiatum</i> McLachlan	Shiri, Dark chub, Sweetfish, Mandarin fish, etc.	- Clear water, and normally high or moderate flow velocity - Rock and gravel at the bottom - A bit attached algae
Fair ~ Fairly Poor	<i>Lymnaeidae</i> , <i>Arhynchobdellidae</i> , Water boatman, <i>Orthetrum albistylum specisum</i> ,	Dace fish, Korean piscivorous chub, False [goby] minnow, Stone moroko, etc	- Low water turbidity, and normally low flow velocity - Small gravel and sand at the bottom - Much attached green algae
Fairly Poor ~ Very Poor	<i>Physa acuta</i> , <i>Tubifex</i> , Red sea bass, Mothfly, Hover fly	crucian [Prussian] carp, carp, loach, Catfish, etc.	- High water turbidity and low flow velocity - Sand and silt at the bottom; and the color of water is black. - Much attached brown/gray algae

Lakes

- Standard for Human Health Protection

This standard is the same as that of rivers and streams for human health protection

- Standard for the Living Environment

Grade	State (Character)	Standard								
		pH	COD (mg/L)	SS (mg/L)	DO (mg/L)	T-P (mg/L)	T-N (mg/L)	Chl-a (mg/m ³)	E-Coliforms(No. of E-Coliforms /100mL)	
									Total Coliforms	Fecal Coliforms
Very Good	I a 	6.5 ~8.5	≤2	≤1	≥7.5	≤0.01	≤0.2	≤5	≤50	≤10
Good	I b 	6.5 ~8.5	≤3	≤5	≥5.0	≤0.02	≤0.3	≤9	≤500	≤100
Fairly Good	II 	6.5 ~8.5	≤4	≤5	≥5.0	≤0.03	≤0.4	≤14	≤1,000	≤200
Fair	III 	6.5 ~8.5	≤5	≤15	≥5.0	≤0.05	≤0.6	≤20	≤5,000	≤1,000
Fairly Poor	IV 	6.0 ~8.5	≤8	≤15	≥2.0	≤0.10	≤1.0	≤35	-	-
Poor	V 	6.0 ~8.5	≤10	No floating garbage	≥2.0	≤0.15	≤1.5	≤70	-	-
Very Poor	VI 	-	>10	-	<2.0	>0.15	>1.5	> 70	-	-

- Remarks
1. When the ration of total nitrogen to total phosphorate is less than 7, the criteria of total phosphorate shall not be applied, and on the other hand, the ratio is more than 16, the criteria of total nitrogen shall not be applied.
 2. Water quality by grade and the status of aquatic ecosystems is the same as the first column of A. Rivers and Streams, (2) the Standard for the Living Environment.
 3. Design of characters is the same as the first column of A. Rivers and Streams, (2) the Standard for the Living Environment.

Groundwater

1. Groundwater used for drinking shall be subject to the standard of drinking water in accordance with article 5 of the Drinking Water Management Act
2. In the case of groundwater for residential / agricultural / fishery / industrial uses

(Unit : mg/L)

Category	Water Use	Living Water	Agricultural Water Fishery Water	Industrial Water
	General Pollutants (5 in total)	pH	5.8~8.5	6.0~8.5
No. of E-Coliforms		≤5,000 (MPN/100mℓ)	-	-
Nitrate Nitrogen (NO ₃ -N)		≤20	≤20	≤40
Chloride (Cl ⁻)		250	≤250	≤500
Total Colony Count		≤100CFU/1 mℓ	-	-
Specific Hazardous Substances (15 in total)	Cadmium (Cd)	≤0.01	≤0.01	≤0.02
	Arsenic (As)	≤0.05	≤0.05	≤0.1
	Cyanide (CN)	ND	ND	≤0.2
	Mercury (Hg)	ND	ND	ND
	Organic Phosphorus	ND	ND	ND
	Phenol	≤0.005	≤0.005	≤0.01
	Lead (Pb)	≤0.1	≤0.1	≤0.2
	Hexachromium (Cr ⁺⁶)	≤0.05	≤0.05	≤0.1
	TCE(Trichloroethylene)	≤0.03	≤0.03	≤0.06
	PCE (Tetrachloroethane)	≤0.01	≤0.01	≤0.02
	1,1,1-Trichloroethane	≤0.15	≤0.3	≤0.5
	Benzene	≤0.015	-	-
	Toluene	≤1	-	-
	Ethyl Benzene	≤0.45	-	-
	Xylene	≤0.75	-	-

Remarks

1. Residential Water : used for domestic purposes including laundry, dishes, and toilets, except for drinking, agriculture, fishery, and the industry.
2. Agricultural / Fishery Water : used for agriculture in accordance with article 2 of enforcement regulations of the Framework Act on Agriculture and Rural Community, and for fishery in conformity with article 2(3) of the Special Act on Rural Development
3. Industrial Water : used for industrial businesses equipped with waste discharge facilities in accordance with article 2(5) of the Water Quality Conservation Act
4. Fishery water and groundwater shall not be subject to the chloride standard, when the concentration of chloride ions does not pose a threat to the public health and groundwater is used for the intended purpose designated by the Minister of Environment.

※ Common criteria : agriculture/fishery/industry water also used for domestic purposes (e.g., laundry, dishes, etc) shall be subject to the standard for residential water.

Drinking Water

Tap Water

- Concentration Standard

(Unit : mg/L)

Classification	Water Pollutants	Standard	Classification	Water Pollutants	Standard	
	55 Substances in Total			Dichloromethane	0.02 mg/L	
Micro-organism	Total Colony Counts	100CFU/ml	Hazardous Organic Substances	Benzene	0.01 mg/L	
	Total Coliforms	ND/100ml		Toluene	0.7 mg/L	
	Fecal Coliforms	ND/100ml		Ethyle Benzene	0.3 mg/L	
	Escherichia Coli	ND/100ml		Xylene	0.5 mg/L	
				1,1-Dichloroethylene	0.03 mg/L	
Hazardous Inorganic Substances	Pb;Lead	0.05 mg/L		Carbontetrachloride	0.002 mg/L	
	F;Fluoride	1.5 mg/L		Pesticide	Diazinon	0.02 mg/L
	As;Arsenic	0.05 mg/L			Parathion	0.06 mg/L
	Se;Selenium	0.01 mg/L			Fenitrothion	0.04 mg/L
	Hg;Mercury	0.001 mg/L			Carbaryl	0.07 mg/L
	CN;Cyanide	0.01 mg/L		1,2-Dibromo-3-Chloropropan	0.003 mg/L	
	Cr ⁶⁺ ;Hexachromium	0.05 mg/L		Disfection Residues	Free Residual Chlorine	4.0 mg/L
	NH ₃ -N;Ammonium Nitrogen	0.5 mg/L			THMs;Trihalomethanes	0.1 mg/L
	NO ₃ -N;Nitrate Nitrogen	10 mg/L			Chloroform	0.08 mg/L
	Cd;Cadmium	0.005 mg/L			Chloralhydrate	0.03 mg/L
B;Boron	0.3 mg/L	Dibromoacetonitrile			0.1 mg/L	
		Dichloroacetonitrile			0.09 mg/L	
		Trichloroacetonitrile			0.004 mg/L	
Volatile Organics	Phenol	0.005 mg/L		HAA;Haloacetic acid	0.1 mg/L	
	1,1,1-Trichloroethane	0.1 mg/L				
	PCE;Tetrachloroethylene	0.01 mg/L				
	TCE;Trichloroethylene	0.03 mg/L				

Classification	Water Pollutants	Standard	Classification	Water Pollutants	Standard
Aesthetic Standard	Hardness	300mg/ℓ	Aesthetic Substances	Zn; Zinc	1 mg/ℓ
	Consumption of KMnO4	10 mg/ℓ		Cl ⁻ ; Chloride	250 mg/ℓ
	Odor	ND		Total Solids	500 mg/ℓ
	Taste	ND		Fe; Iron	0.3 mg/ℓ
	Cu; Cooper	1 mg/ℓ		Mn; Manganese	0.3 mg/ℓ
	Color	5		Turbidity	0.5 NTU
	ABS; Alkyl Benzene Sulfate	0.5 mg/ℓ		SO ₄ ⁻² ; Sulfate	200 mg/ℓ
	pH	5.8~8.5		Al; Aluminium	0.2 mg/ℓ

- Treatment Technique Standard

Classification	Standard	Detailed Standard
Virus	Remove or knockout 99.99% or more	<input type="checkbox"/> The inactivity ratio must be 1 or higher. <input type="checkbox"/> Measurement of turbidity and residual chlorine at 4-hr intervals more than six times during a day - The average value of two samples measured consecutively must not exceed 0.5NTU, and each sample not exceed 1.0NTU - Reinforcement of the turbidity standard according to the capacity of water purification plants (100,000ton ≤ : since July 2004, 50,000ton ≤ : since July 2005, 5,000ton ≤ : since Jan. 2007) • More than 95% of samples measured monthly must not exceed 0.3NTU (in the case of slow filtration, 0.5NTU), and each sample not 1.0NTU. • Water quality monitoring on each individual filter every 15 minutes by using a continuous measuring device
Giardia Cyst	Remove or knockout 99.9% or more	

Bottled Water

Classification	Water Pollutants		Standard	Classification	Water Pollutants	Standard	
	51 items in Total						
Micro-organism	Total Colony Counts	Psychrophilic bacteria (21°C)	100CFU/mL	Hazardous Organic Substances	Volatile Organics	Toluene	0.7 mg/L
		Mesophilic Bacteria (35°C)	20CFU/mL			Ethyl Benzene	0.3 mg/L
	Total Coliforms		ND/250 mL			Xylene	0.5 mg/L
	Fecal Streptococci		ND/250 mL			1,1-Dichloroethylene	0.03 mg/L
	Pseudomonas aeruginosa		ND/250 mL			Carbontetrachloride	0.002 mg/L
	Spore-forming Sulfite-reducing anaerobes		ND/50 mL		Pesticide	Diazinon	0.02 mg/L
	Salmonella		ND/250 mL			Parathion	0.06 mg/L
	Shigella		ND/250 mL			Fenitrothion	0.04 mg/L
			Carbaryl			0.07 mg/L	
			1,2-Dibromo-3-Chloropropan			0.003 mg/L	
Hazardous Inorganic Substances	Pb; Lead		0.05 mg/L		Aesthetic Substances	Hardness	500 mg/L
	F; Fluoride		2.0 mg/L			Consumption of KMnO4	10 mg/L
	As; Arsenic		0.05 mg/L			Odor	ND
	Se; Selenium		0.01 mg/L			Taste	ND
	Hg; Mercury		0.001 mg/L	Cu; Cooper		1 mg/L	
	CN; Cyanide		0.01 mg/L	Color		5	
	Cr ⁺⁶ ; Hexachromium		0.05 mg/L	ABS; Alkyl Benzene Sulfate		ND	
	NH ₃ -N		0.5 mg/L	pH		5.8~8.5	
	NO ₃ -N; Nitrate Nitrogen		10 mg/L	Zn; Zinc		1 mg/L	
	Cd; Cadmium		0.005 mg/L	Cl ⁻ ; Chloride		250 mg/L	
Hazardous Organic Substances	Volatile Organics	Phenol		0.005 mg/L	Total Solds	500 mg/L	
		1,1,1-Trichloroethane		0.1 mg/L	Fe; Iron	0.3 mg/L	
		PCE; Tetrachloroethylene		0.01 mg/L	Mn; Manganese	0.3 mg/L	
		TCE; Trichloroethylene		0.03 mg/L	Turbidity	1.0 NTU	
		Dichloromethane		0.02 mg/L	SO ₄ ⁻² ; Sulfate	200 mg/L	
		Benzene		0.01 mg/L	Al; Aluminium	0.2 mg/L	

- ND : Not Detected

- Total Colony Counts are inspected within 12 hours after being bottled at 4°C

Public Water Supply Wells

Classification	Water Pollutants	Standard	Classification	Water Pollutants	Standard	
	48 items in Total					
Micro-organism	Total Colony Counts	100CFU/mℓ	Hazardous Organic Substances	Pesticide	Xylene	0.5mg/ℓ
	Total Coliforms	ND/100mℓ			1,1-Dichloroethylene	0.03 mg/ℓ
	Fecal Coliforms	ND/100mℓ			Carbontetrachloride	0.002 mg/ℓ
	Escherichia Coli	ND/100mℓ			Diazinon	0.02 mg/ℓ
	Yersinia	ND/2 ℓ			Parathion	0.06 mg/ℓ
Hazardous Inorganic Substances	Pb;Lead	0.05 mg/ℓ		Aesthetic Substances	Fenitrothion	0.04 mg/ℓ
	F;Fluoride	1.5 mg/ℓ			Carbaryl	0.07 mg/ℓ
	As;Arsenic	0.05 mg/ℓ			1,2-Dibromo-3-Chloropropan	0.003 mg/ℓ
	Se;Selenium	0.01 mg/ℓ			Hardness	300mg/ℓ
	Hg;Mercury	0.001 mg/ℓ			Consumption of KMnO4	10 mg/ℓ
	CN;Cyanide	0.01 mg/ℓ	Odor		ND	
	Cr ⁺⁶ ;Hexachromium	0.05 mg/ℓ	Taste		ND	
	NH ₃ -N	0.5 mg/ℓ	Cu; Cooper		1 mg/ℓ	
	NO ₃ -N;Nitrate Nitrogen	10 mg/ℓ	Color		5	
	Cd;Cadmium	0.005 mg/ℓ	ABS; Alkyl Benzene Sulfate		0.5 mg/ℓ	
B;Boron	0.3 mg/ℓ	pH	5.8~8.5			
Hazardous Organic Substances	Volatile Organics	Phenol	0.005 mg/ℓ	Zn; Zinc	1 mg/ℓ	
		1,1,1-Trichloroethane	0.1 mg/ℓ	Cl ⁻ ; Chloride	250 mg/ℓ	
		PCE;Tetrachloroethylene	0.01 mg/ℓ	Total Solds	500 mg/ℓ	
		TCE;Trichloroethylene	0.03 mg/ℓ	Fe; Iron	0.3 mg/ℓ	
		Dichloromethane	0.02 mg/ℓ	Mn; Manganese	0.3 mg/ℓ	
		Benzene	0.01 mg/ℓ	Turbidity	1.0 NTU	
		Toluene	0.7 mg/ℓ	SO ₄ ⁻² ;Sulfate	200 mg/ℓ	
		Ethyle Benzene	0.3 mg/ℓ	Al; Aluminium	0.2 mg/ℓ	

Discharge Water Quality

Sewerage Treatment Facility

Standard		BOD (mg/L)	COD (mg/L)	SS (mg/L)	T-N (mg/L)	T-P (mg/L)	Total Coliforms (No./m ³)
Classification							
Sewerage Act	Specific Areas	≤10	≤40	≤10	≤20	≤2	
	Other Areas	≤20	≤40	≤20	≤60	≤8	≤3,000

- Remarks**
- Of special management areas at the Han river watersheds, designated in accordance with article 22 of the Framework Act on Environmental Policy, the Paldang special countermeasure area for the protection of water quality and the Jamsil water reservoir shall be subject to the standard for the special management area since January 1st 2002.
 - The Han river watersheds (except for the Jamsil water reservoir) and the Nakdong /Geum/Youngsan/Sumjin river watersheds shall be subject to the standard for the special management area since January 1st 2004. However, they shall be subject to regional standards, if discharge water from sewerage treatment facilities does not inflow into major rivers and streams and there is no water supply facility at the discharge point in accordance with article 3(15) of the Water Supply & Waterworks Installation Act.
 - Regions excluding the areas subject to the standard for the special management zone shall follow regional standards, but shall be subject to the aforementioned special standard since January 1st, 2008.
 - Regarding total nitrogen and total phosphate, the areas subject to the standard for the special management zone shall follow regional standards in the winter season of December to March.
 - The standard for the number of coliforms shall be applied to all areas since January 1st, 2003. A more reinforced standard for discharge water, i.e., 1,000coliforms/ml shall be applied to the areas below.
 - Clean areas under annexed list 5 of enforcement regulations of the Water Quality Conservation Act.
 - The areas within 10km of upstream distance from water source protection areas and boundaries, in accordance with article 5 of the Water Supply and Waterworks Installation Act
 - The areas within 15km of upstream distance from water supply facilities, in accordance with article 3(15) of the Water Supply and Waterworks Installation Act

Wastewater Treatment Facility

Standard	BOD (mg/L)	COD (mg/L)	SS (mg/L)	T-N (mg/L)	T-P (mg/L)	Total Coliform(No. of Total Coliforms/m ³)
Period						
By Dec. 31, 2007	≤30(30)	≤40(40)	≤30(30)	≤60(60)	≤8(8)	
Jan. 1, 2008.1.1~Dec.31, 2012	≤20(30)	≤40(40)	≤20(30)	≤40(60)	≤4(8)	≤3,000
From Jan. 1, 2013	≤10(10)	≤40(40)	≤10(10)	≤ 20(20)	≤2(2)	≤3,000 (3,000)

- Remarks**
- The standards for water discharged from waste treatment facilities of industrial and agro-industrial complexes are decided and notified by the Minister of Environment, with a request from an operator of the aforementioned facility. Pollutants (e.g., phenol) which discharge water contains refer to ones which are treatable at the facilities within the permissible discharge standard applied to specific areas, in accordance with article 8, annexed list 5 (2) of the Water Quality Conservation Act.
 - The parentheses in the Table above show the standard for the quality of water discharged from the waste treatment facility at agro-industrial complexes.

Public Treatment Facility for Human/Livestock Waste

Standard Classification	BOD (mg/L)	COD (mg/L)	SS (mg/L)	Total Coliforms (No./m ^l)	Others (mg/L)
Human Waste Treatment Facility	≤30	≤50	≤30	≤3,000	T-N : ≤60 T-P : ≤8
Livestock Waste Treatment Facility	≤30	≤50	≤30	≤3,000	T-N : ≤60 T-P : ≤8

Soil

(Unit : mg/kg)

Soil Contaminants (16 in total)	Precautionary Level		Regulatory Level	
	"Ga" Zone	"Na" Zone	"Ga" Zone	"Na" Zone
Cadmium	1.5	12	4	30
Copper	50	200	125	500
Arsenic	6	20	15	50
Mercury	4	16	10	40
Lead	100	400	300	1,000
Hexachromium	4	12	10	30
Zinc	300	800	700	2,000
Nickel	40	160	100	400
Fluorine	400	800	800	2,000
Organic Phosphorus Compounds	10	30	-	-
PCB	-	12	-	30
Cyanide	2	120	5	300
Phenol	4	20	10	50
Oil (except animal and plant types) - Benzene · Toluene · Ethyle Benzene · Xylene(BTEX) - Total Petroleum Hydrocarbon(TPH)	- 500	80 2,000	- 1,200	200 5,000
Trichloroethylene (TCE)	8	40	20	100
Tetrachloroethylene (PCE)	4	24	10	60

Remarks

- "Ga" Zone : the land used for paddy fields, orchards, ranches, forest, streams, water supply, building lots, school lots, parks, amusement parks, and religion activities, and physical activities (only in the areas of grass and trees), in accordance with the land category of the Cadastral Act
- "Na" Zone : the land used for plant lots, roads/ railroads, and multipurpose lots, in accordance with the land category of the Cadastral Act

ECOREA



Environmental Review 2007, Korea



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