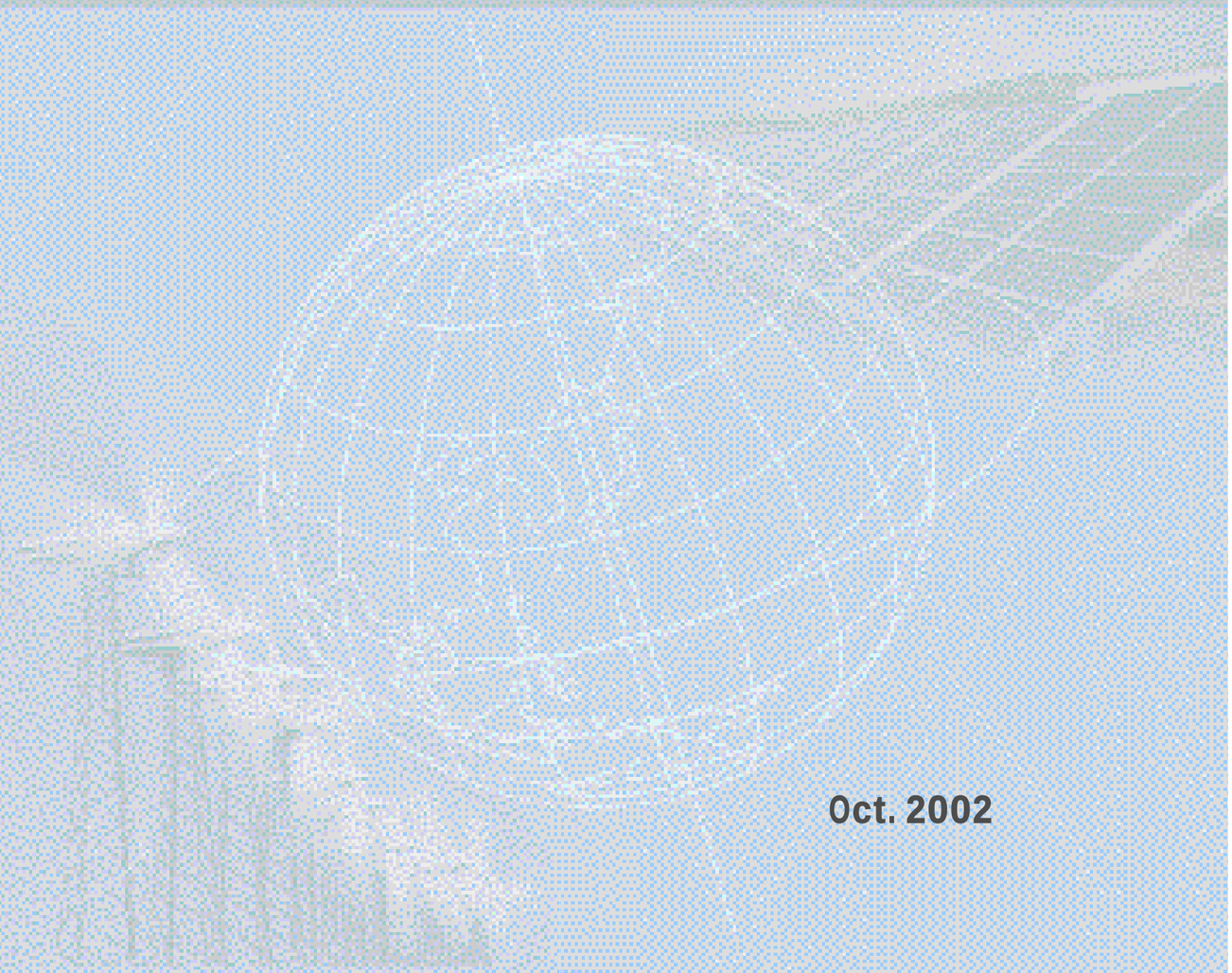
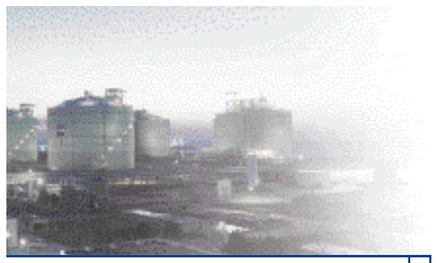
Korea's Climate Change Policy in the Energy and Industrial Sector



Oct. 2002

Ministry of Commerce, Industry & Energy
Republic of Korea



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Executive Summary

Current Situation

Whereas industrialized countries have gone through a long period of economic development since the industrial revolution to arrive at the stage of stable economic development and energy consumption, Korea started its economic development in earnest only in the 1970s, focusing on energy intensive heavy & chemical industries, including steel, chemicals, shipbuilding and cement. Since Korea is a relatively young economy, it will take a considerable period of time before Korea reaches a stable growth path.

Korea's Efforts to Mitigate Climate Change

Korea has been implementing policies concerning energy, environmental protection and economic development through a variety of programs. In order to formulate and implement measures to deal more efficiently with the United Nations Framework Convention on Climate Change(UNFCCC), an Inter-Ministerial Committee on the UNFCCC comprised of related government agencies, research institutions and private companies, was established in April 1998 with the Prime Minister as the head of the committee. The committee are preparing and implementing comprehensive measures to cope with the UNFCCC every three years. It is noteworthy that since 1995 the Korean government has budgeted more than 5.3 trillion Won(US$ 6 billion) to finance various projects aimed at mitigating the adverse effects of climate change through the "Energy Project Special Account."

Major Achievements in the Energy & Industrial Sector

Since more than 97% of Korea's energy demand is met through imports, Korea's energy policy has always placed top priority on energy conservation and energy efficiency even before the adoption of the UNFCCC in 1992. After the Rio Conference, such efforts have been further strengthened. In addition, the use of energy sources with low carbon intensity, such as nuclear energy and LNG is continuing to be expanded and the policy of promoting energy-related technology development is being vigorously implemented.

Challenges for the Future

The Korean government will promote less energy-intensive economic activities and encourage a more environmentally friendly life style. Furthermore, the government will develop and commercialize innovative technology to reduce the emissions of greenhouse gases, such as a next-generation nuclear reactor and a fuel cell. At the same time it will promote a "Clean Energy Community" to enhance energy efficiency in the residential and commercial sectors

Korea as an Attractive CDM Partner

Korea has been implementing a wide range of projects to reduce greenhouse gases. Given that Korean companies are committed to and have longstanding experience in energy conservation and GHG reduction and the government has a strong commitment to such projects and supports a very stable and favorable investment environment, Korea can be a very attractive CDM partner.

I. Korea at a Glance

Natural Environment

The Republic of Korea occupies the southern half of the Korean Peninsula, which lies between east longitudes 125°04'and 131°52'and between north latitudes 36°06'and 38°27'. The land area of the Republic of Korea is 99,313 km2, 65.9% of which is covered by mountains.

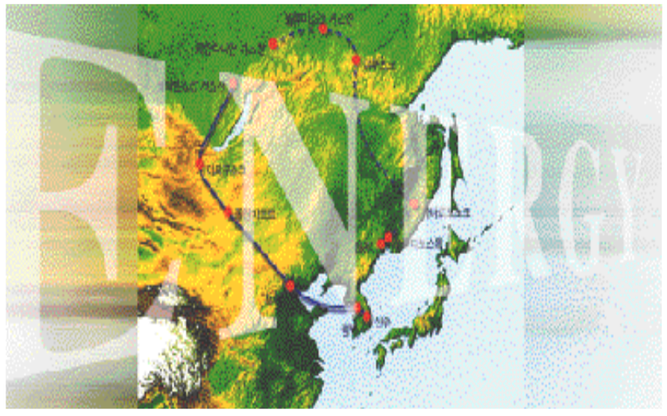
Korea is located in the middle latitudes, within the temperate zone and it has four distinct seasons. Seasonal temperature fluctuations are great, which means there is a sudden rise in energy demand for heating during winter and for air conditioning during summer. Moreover, Korea is very densely populated. In, 2001, Korea's total population reached 47.3 million, placing it among the most densely populated countries in the world, with 471 people per ㎢.

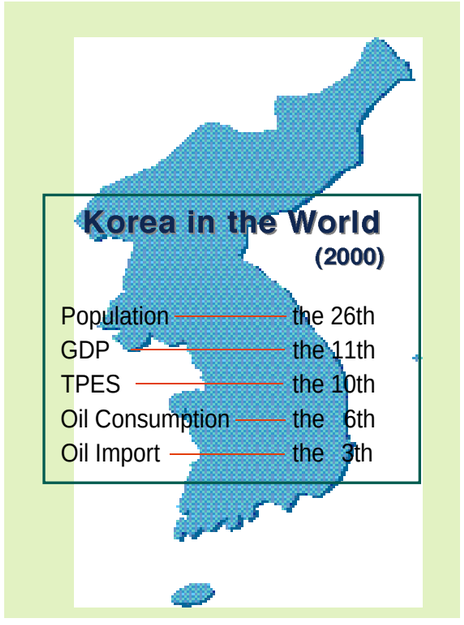
Economy & Industry

Current Economic Situation

Due to the impact of the recent Asian financial crisis, the Korean economy underwent a serious economic downturn. However, the government took a series of bold reform and rationalization measures in the public, financial, labor, and corporate sectors, and successfully established a foundation for another economic leap forward.

It is estimated that economic growth for 2001 would reach 3.0%, and that steady growth is likely to continue. Per capita GNP is expected to reach the current OECD average(US$20,000) after the year 2013(World Economic Outlook, 2001).



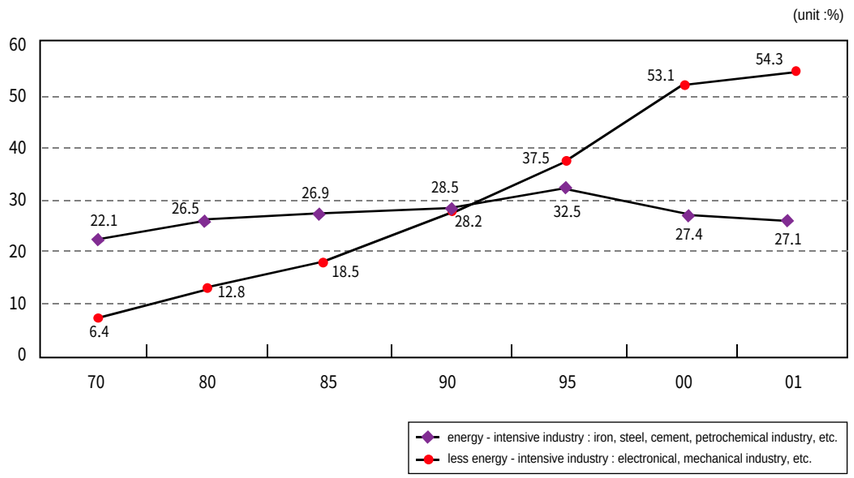


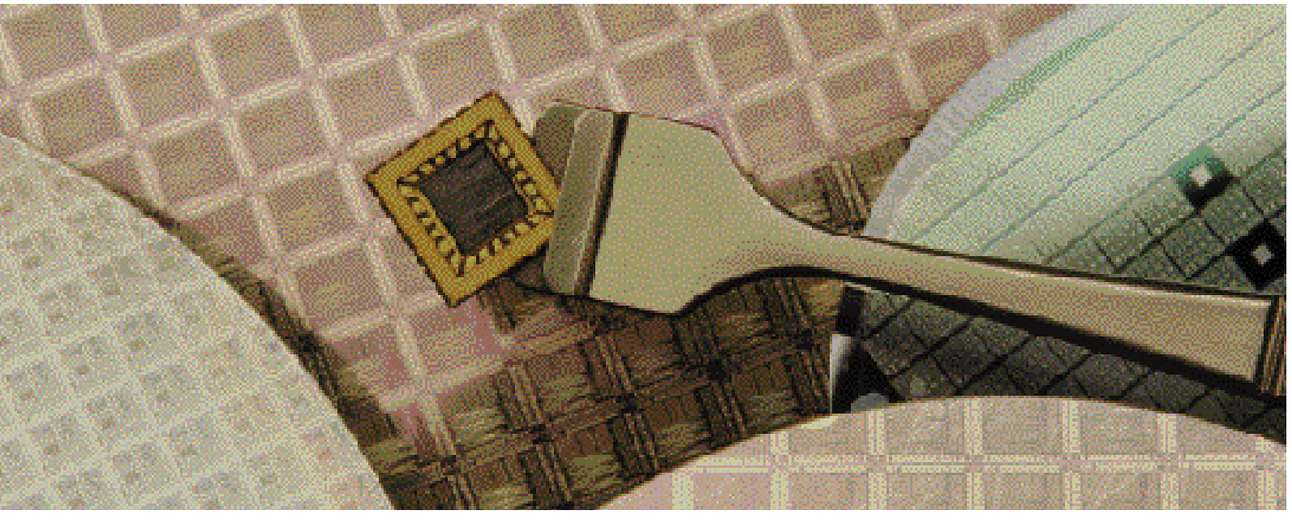
Industrial Structure

From the time of Korea's economic takeoff in the mid-1970s until the recent economic downturn, real GNP grew at an average annual rate of 9.5%. Since its economic takeoff, the country has been called "World Plant" because it has been a worldwide supplier of energy-intensive intermediate goods such as iron & steel and petrochemicals as well as consumer durables such as automobiles and electronic goods.

The share of added value created by heavy & chemical industry in the total added value of the manufacturing sector increased from 22.1% in 1970 to 27.1% in 2001. Currently, the government is implementing measures for Korea's transformation into a knowledge-based economy.

Industrial Structure





II. Energy Consumption and CO_2 Emission in Korea

Energy consumption in Korea is increased rapidly in tandem with the industrialization of the 1970s. CO_2 emissions are also increased. But, due to energy conservation and shift to less energy intensive - industry - IT, BT - energy cosumption has recently been stabilized.

Energy Indicator in Korea

	1970	1980	1990	1995	2000	2001
Population(million)	32.2	38.1	42.9	45.1	47.0	47.3
GDP(billion, 95US$)	8.0	62.2	252.5	489.4	461.7	422.2
TPES(Mtoe)	19.7	43.9	93.2	150.4	192.9	198.4
Energy Overseas Dependence (%)	47.5	73.5	87.9	96.8	97.2	97.3

Energy Consumption

Energy Consumption by sources shows that the increase in energy consumption was led by the LNG and nuclear.

Energy Consumption by sources

(unit:Mtoe)

Sector	1970	1980	1990	1995	2000	2001
Oil	93	26.8	50.2	94.0	100.3	100.4
LNG	-	-	3.0	9.2	18.9	20.8
Anthracite	5.8	9.9	9.9	3.0	3.1	3.7
Bitumionous	0.1	3.3	14.4	25.1	39.8	42.0
Hydro	0.3	0.5	1.6	1.4	1.4	1.0
Nuclear	-	0.9	13.2	16.8	27.2	28.0
Firewood & Others	4.3	2.5	0.8	1.1	2.1	2.5
TPES	**19.7**	**43.9**	**93.2**	**150.4**	**192.9**	**198.4**

The increase in energy consumption was led by the industrial sector. The energy consumption in industry sector has rapidly been increased from 16.2 Mote in 1980 to 85.2 Mote in 2001.

Energy Consumption by Sectors

(unit:Mtoe)

Sector	1980	1990	1995	2000	2001
Industry	16.2	36.2	62.9	84.1	85.2
Transport	5.1	14.2	27.1	30.9	31.9
Residential/ Commercial	14.0	22.0	29.5	32.4	32.9
Public & Others	2.3	2.8	2.4	1.2	3.0
Total	**37.8**	**75.1**	**122.0**	**150.1**	**153.0**

The unique feature of Korea ŝ energy consumption structure is that the share of non-energy use, most of which is the petrochemicals feedstock such as naphtha, is 13.0%, much higher than that of other industrialized countries(3 5%). This is owing to the rapid expansion of the petrochemicals industry, which has increased the consumption of naphtha at an average consumption rate of 16.5 percent annually during the period of 1990-2000.

Non-energy use in Total Primary Energy Supply

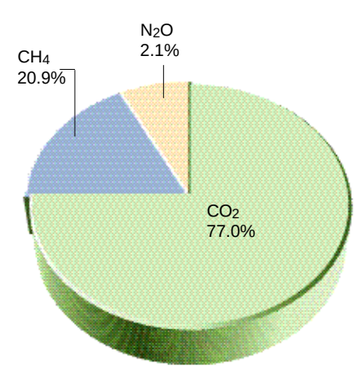
(unit :%)

	Korea	Japan	U.S.A	France	Germany
1990	6.5	5.1	2.6	3.8	3.9
2000	13.0	6.4	2.8	4.5	5.9

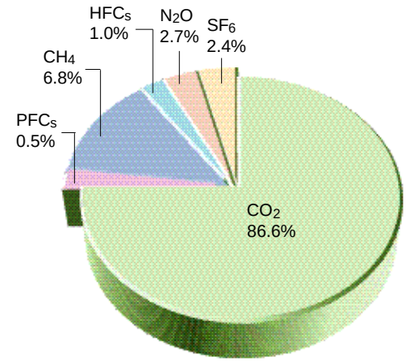
(Source : Energy Balances of OECD Countries 2002)

GHG emissions by gases

Among all greenhouse gases, CO_2 emissions are the greatest, accounting for 86.6 percent of the total emissions in Korea. This figure is considered as relatively higher than other countries.



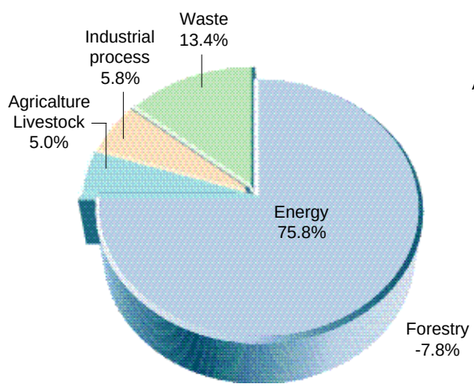
GHG emissions by gases, 1990



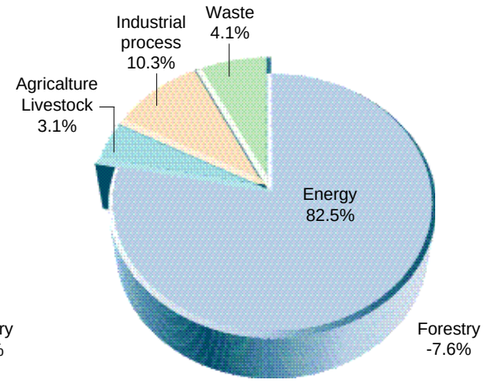
GHG emissions by gases, 2000

GHG emissions by sectors

GHG emissions in energy sectors are the greatest among all greenhouse gases and GHG emission in industrial sector is increased rapidly.



GHG emissions by sectors, 1990

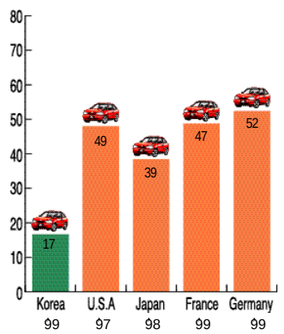


GHG emissions by sectors, 2000

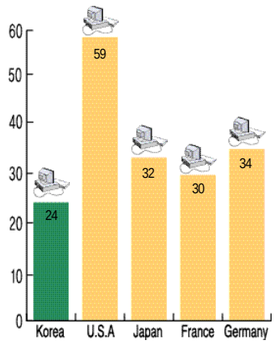
Due to the rapid growth in manufacturing industries, greenhouse gas emissions in the energy and industrial process sector are accordingly increasing rapidly. However, since 1998 the currency and financial crisis had a negative impact on the national economy slowing down its growth rate. As of 2000, greenhouse gas emissions in the energy and industrial process sector represented 93 percent of the total emissions.

The reason energy consumption and CO_2 emissions increased so much is because in Korea, unlike other industrialized countries where energy consumption and economic growth have been stabilized, the economy is still in its manufacturing-based growth stage, where the ownership of cars and home appliances such as dishwashers has not reached the saturation point.

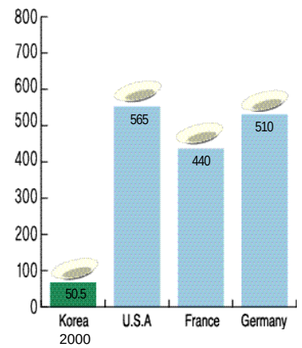
Number of passenger cars per 100 people



Number of personal computers per 100 people (2000)



Number of dishwashers per 1,000 households(1999)



Ⅲ. Korea's Efforts to Mitigate Climate Change

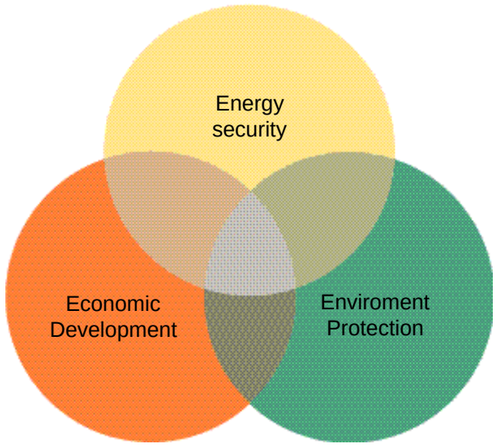
Goals

Harmonization of 3E's

Korea will pursue sustainable development through the harmonization of the three E's: energy security, economic development and environment protection.

Active Participation in the efforts to prevent global warming

Korea will continue to actively participate in the global efforts to mitigate climate change and play its part to ensure significant GHG emissions reductions moving toward the ultimate goal of the Convention on Climate Change adopted at the Rio Conference in 1992.



Principle

Common but Differentiated Responsibility

As stipulated in the UNFCCC, Korea renders its best efforts to mitigate global warming within its historical responsibility and capabilities.

Partnership among Government, Industry and the Public

Korea's policy to reduce greenhouse gases will be formulated and implemented through a partnership among government, industry and the public.

Inclusion of all kinds of Gases in Every Sector

Korea's policy to reduce greenhouse gases will target all greenhouse gases originating not only from the use of energy but also from all other sectors, including agriculture and waste management.

A Framework for Effective Implementation

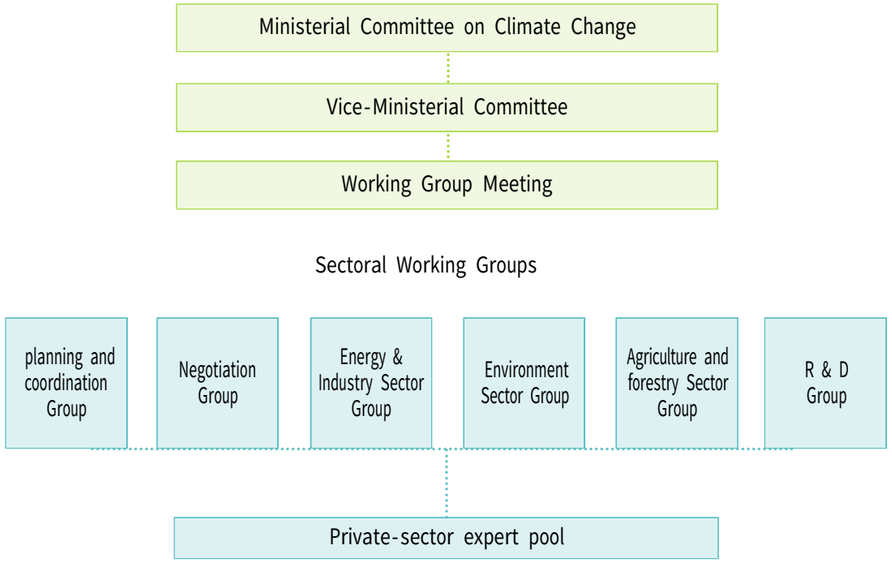
Inter-Ministerial Climate Change Committee

To cope with the issues of the UNFCCC more efficiently and systematically, Korea has established an Inter-Ministerial Committee on the UNFCCC comprised of related government agencies, academia, and industry under the chairmanship of the Prime Minister in April 1998. This committee conducts three levels of meetings; ministerial, vice ministerial, and working-level, under which there are five working teams. In July 2001, the planning and coordination group was newly established to better coordinate existing working groups.

Comprehensive Action Plan

Korea formulated an comprehensive action plan in December 1998 to cost-effectively reduce greenhouse gases in the energy, industry, wastes and agricultural sectors, and to develop ways to make use of the Kyoto Mechanism, including the Clean Development Mechanism. Since then, Korea has been actively implementing this action plan, which are subject to annual evaluation and regular updates every three years. In March 2002, the Prime Minister announced the second action plan including a comprehensive range of new and expanded programs to accelerate a shift to a less energy-intensive economy and stimulate efforts to ensure real GHG emissions reductions. The plan also proposes a strategy for the government to set a national target reflecting existing trends in domestic energy consumption.

Inter-governmental Committee on the UNFCCC



The primary goal of the plan is to establish of a less energy-intensive economic structure by stimulating efforts to conserve energy in all sectors including industry, transport, and residential, while accelerating development of less energy-intensive industries, such as information technology and future innovative technologies, The plan also aims to make a strong contribution to the global efforts for climate change mitigation and active participation in international negotiation processes taking into account existing trends in domestic energy consumption

Comprehensive Action Plan

- Period:2002-2004
- Cycle of supervision and evaluation: yearly
- Office responsible for supervision and evaluation : Office for National Policy Coordination
- Cycle of updating the plan : every three years
- Responsible for implementation : each ministry
- Main content
  - Promotion of R&D on GHG reduction technologies including new and renewable energy, and medium and large-scale technologies
  - Expansion of GHGs reduction programs in all sectors including industry, transport, residential, waste management, and agriculture, in particular through establishing a integrated management system for energy conservation.
  - Facilitation of use of Kyoto Mechanisms such as the Clean Development Mechanism and Emission Trading by implementing a range of supporting programs and development of a GHG registry system.
  - Development of a partnership between the government, industry, and NGOs and Promotion of public participation through raising public awareness

Energy Project Special Account : A Firm Commitment to Cope with the Real Issues of Global Warming

Since 1985, the Korean government has been supporting the GHG mitigation projects in the energy sector through the Petroleum Business Fund which is a kind of energy tax. In 1995, the government amalgamated the Petroleum Business Fund with four other minor energy and resources related funds to create a special account, called the Energy Project Special Account.

Revenue	Expenditure
• Import surcharges on petroleum(14W/ℓ) and LNG(9750₩/ton) • Sales surcharges on kerosene • Safety management surcharges on LNG and LPG	• Energy Conservation • Energy Technology R&D and NRSE Development • Promotion of LNG • Phasing-out of the Anthracite Coal Mines • Others

The budget of the Energy Project Special Account has been increased by more than 10% annually reflecting the serious concern of the government about energy and environment issues. Since 1995, the Korean government has provided 5.3 trillion Won for reducing GHG emission through the Energy Project Special Account by the year 2002.

Budget of Energy Project Special Account

(unit : bil. Won)

	1995	1996	1997	1998	1999	2000	2001	2002	Total
New and renewable energy	15	25	31	34	20	15	20	25	185
RRD	27	27	33	30	40	50	62	56	325
Massive energy supply	91	114	159	178	212	161	173	199	1,287
promotion of LNG	124	170	170	209	239	212	365	210	1,699
sub-total	372	462	527	630	726	709	879	970	5,275
Phasing-out of the Anthracite Coal Mine	515	566	543	563	531	459	481	487	4,145
Others	541	654	856	859	736	753	949	1,211	6,559
Total	1,428	1,682	1,926	2,052	1,993	1,921	2,309	2,668	15,979

※ Average Won-Dollar exchange rate: 777.04 (1995), 950.94 (1997), 1,194.08 (1999), 1,300(2000), 1,313(2001)

IV. Major Achievements in the Energy and Industrial Sector

1. Energy Conservation and GHGs Reduction

Due to its scarce fossil fuel resources, Korea has given high priority on energy conservation policies even before the UNFCCC was adopted. After the global oil crises of the 1970s, energy conservation policies were adopted which were later strengthened after the Rio Environment Conference in 1992.

In 1979, the Korean government began to implement comprehensive and aggressive energy conservation programs based on the Rational Energy Utilization Act. Based on this act, the government stepped up its efforts to build a low-energy consumption industrial structure with various energy conservation and efficiency improvement policies for industry, transport, and residential sectors.

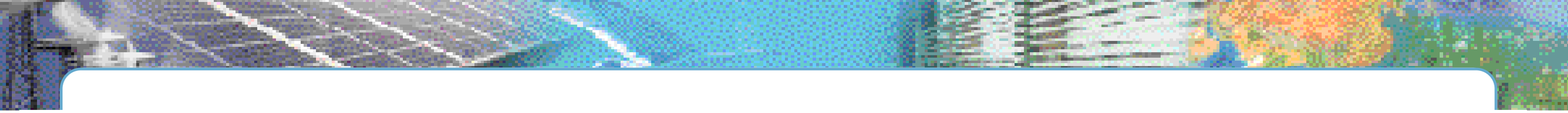
Industrial Sector

Voluntary Agreement

A number of energy-intensive industries including iron and steel, petrochemicals, and cement, agreed with the government to voluntarily reduce energy consumption and CO_2 emissions over five years. The number of companies in VA has increased to such an extent that 374 plants joined the agreement as of the end of 2001. As a result, Greenhouse gas emissions are projected to be reduced by 4,344 thousand tC through 2005.

CO_2 Reduction Plan of companies Participating in V.A

Year	Participating factories	Period	Energy Consumption (Thou.TOE/year)	Energy Reduction (Thou.TOE)	CO_2 Reduction (Thou.TC)	Investment (bil.Won)
1998	15	99 2003	18,012	1,360	1,426	1,098.3
1999	31	99 2003	3,951	574	470	290.0
1999	21	2000 2004	6,257	552	403	161.1
2000	145	2000 2004	45,589	1,628	1,414	1,156
2001	162	2001 2005	7,425	652	630	241,4



Reduction of perfluorocarbons(PFCs) in Semi-conductor Manufacturing Industry

Korean Semi-conductor manufacturing industries have the commitment to cut their PFC emissions by at least 10 percent below 1997 levels by 2010 under an agreement with the World Semiconductor Council. To respond to this agreement, the leading companies such as Samsung and Hyundai have made greater efforts to develop new technologies to reduce PFC emissions. Meanwhile, the government made a plan to establish a long-term strategy and significantly enlarge its investment in R&D. In addition, the government is planning to launch the voluntary agreement to reduce PFC emissions in partnership with main companies in 2003.

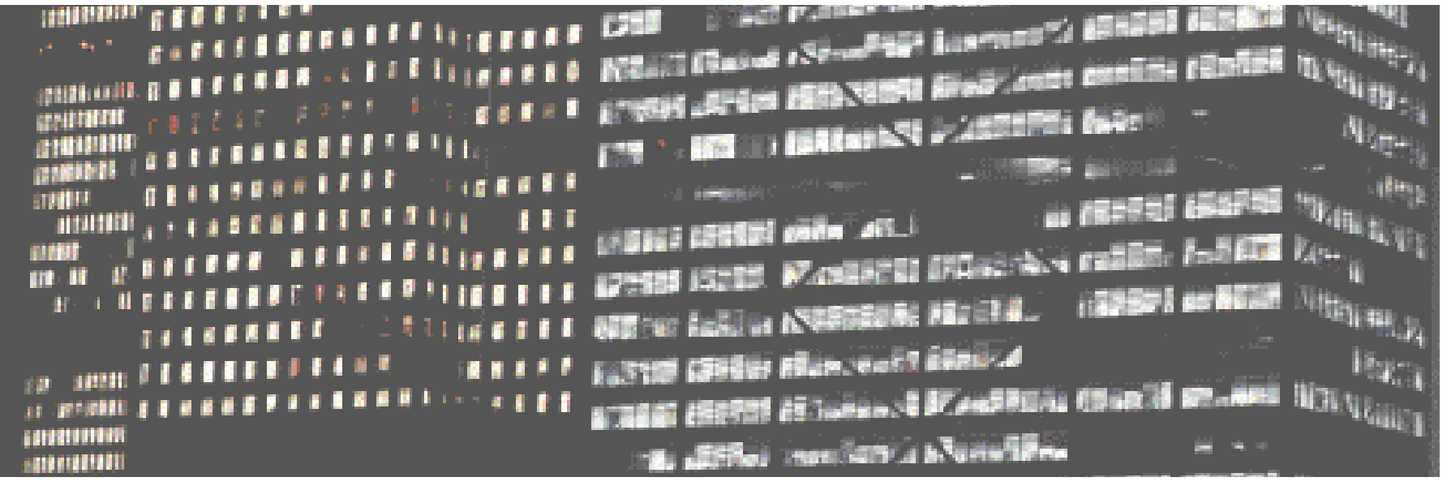
Residential and Commercial Sectors

Management of Energy Intensive Buildings

In order to promote building energy conservation, the government has been monitoring all buildings which consume more than 4 million kWh per year since 1992. The government also mandated that the operators of buildings that use more than 2,000 toe(ton of oil equivalent) annually report to the government their annual energy consumption along with their energy reduction achievements.

Energy efficiency labeling system

In 1992, the government introduced an energy efficiency labeling system for six major consumer products, including refrigerators, air-conditioners and automobiles, to raise consumers awareness of the importance of energy-efficiency. This program helps consumer choose more energy efficient products based on the energy efficiency labeling rated from 1 to 5. Currently the labeling system is applied to 11 durable consumer products.



Transportation Sector

Fuel-efficiency labeling system

The fuel-efficiency labeling system aims to provide consumers with information about fuel consumption of new cars which enables them to compare the efficiency of different models of cars. As of 2001, this label is attached to 241 car models using gasoline and LPG.

Promoting Smaller Cars and Public Transporation

The government encourages the purchase of light fuel-efficient cars. Various incentives including tax reductions for light cars, such as a 2% registration fee instead of the 5% for large and medium-sized vehicles are provided. At the same time, a mass transit system such as the subway is being expanded in Korea's major metropolitan areas.

Public Sector

To reduce greenhouse gas emissions through energy conservation, public institutions are taking the initiative in energy efficiency improvement, thus driving a nationwide energy conservation movement.

Prior Consultation on the Energy Utilization Planning Program

Under the authority of the ' Rational Energy Utilization Act, the ' Prior Consultation on Energy Utilization Planning Program ' was established in 1993 in order to promote an energy-efficient society. This program assesses the energy conservation plans for a large scale public projects prior to their launch and at the same time provides technical guidance and assistance. Through this program, 245 projects were provided with consultations from 1993 to 2001.

Energy Conservation Guideline for Public Institutions

The ' Energy Conservation Guideline for Public Institutions ' was introduced in 1997 in order to help public institutions to play a leading role in energy conservation. The guideline offer public institutions some guidance in establishing, implementing, and evaluating an annual plan for energy conservation.

Encouraging the Public Sector to Use Energy-Efficient Appliances and Equipments

The government has pressed the central government agencies and local administrations to use energy-efficient equipment and appliances, such as high-efficiency motors and 26mm slim-type fluorescent lamps.

Cross Sectoral policies

Energy Service Companies (ESCOs)

ESCO was introduced in Korea to extend government-led energy conservation programs to private companies in accordance with their particular needs and creativity. After three companies started the ESCO business in 1992, the number of registered companies grew to 159 by August 2001. The operational focuses of the companies are high efficiency lighting, alternative electricity facilities, waste heat recovery, heating and cooling systems and process improvement.

Publicity Campaigns and Educational Programs

A number of publicity campaigns and educational programs have been developed to enhance public awareness about the importance of conserving energy, especially with regard to economic and environmental concerns.

Green Energy Family

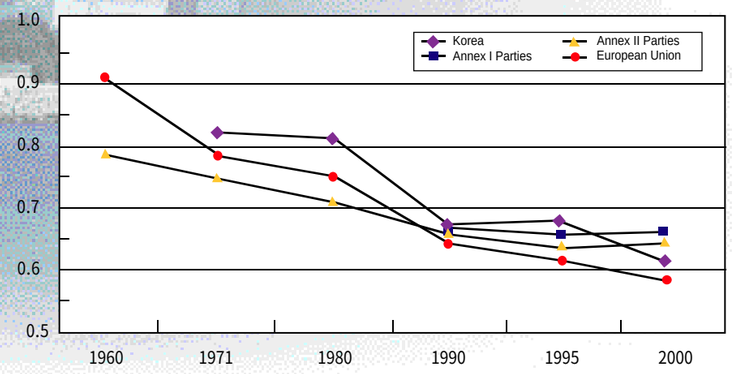
The Green Energy Family(GEF) is a movement to encourage voluntary participation of NGOs and private companies in CO_2 reduction and energy conservation. Any company which is willing to take part in the GEF movement can submit an application to the GEF Center establish a voluntary agreement to pursue the goal of a particular GEF program. At present, the GEF movement focuses on four programs, which have been implemented in every sector to encourage the use of high-energy efficient facilities. As of 2001, 988 companies have joined the GEF; 592 in the Green Lighting Program, 152 in the Green Motor Program, 102 in the Green Energy Design and 142 in the Green Cooling Program.

More Efficient Energy Supply

District heating, which was first introduced in 1985, is supplying heat and electricity to 939,438 households in the Seoul metropolitan area as of 2001. At the same time, a total of 20 co-generation plants are in operation at 15 industrial complexes. On the other hand, given the decreased demand for massive residential site development, the government is seeking to develop smaller district heating and cooling systems in downtown areas.

2. Adopting Less Carbon Intensive Energy Mix

Comparision of Carbon Intensity between Some Selected Countries



Nuclear Power Generation

Nuclear power generation has been promoted to secure energy supply and boost economic development. In 1978, the nation's first nuclear power plant was completed. As a result of sustained efforts, more than one-half of the electric power consumed in Korea was supplied by nuclear power plants in 1987. At the end of 2002, there were 17 nuclear power plants in commercial operation with a total installed capacity of 14,716MW and three units were under construction.

Korea now ranks as the 6th largest country in the world in the use of nuclear energy and is recognized as a country that is outstanding and successful in the development and application of nuclear power. As of 2000, the proportion of Korea's nuclear power generation out of total domestic power generation was the fourth in the world.

The share of electricity produced by nuclear power plants in total power generation will be increased from 39.3% in 2001 to 46% in 2015 and the share of nuclear power plants in total power generation facilities will be increased from 27.0% in 2001 to 34.6% in 2015.

Nuclear power generation is currently viewed as a possible solution to climate change mitigation. However, major difficulties such as the NIMBY syndrome have yet to be resolved before further development.

Producers of Nuclear Power (2000)

Country	% of nuclear in total electricity generation
France	77
Ukraine	45
Sweden	39
Korea	**37**
Germany	30
Japan	30
Spain	28
United Kingdom	23
United States	20
OECD	23
World	17

Source : IEA 2002

LNG as a Clean Energy

With a per capita GNP less than US$1000 right after 1980, it was not an easy choice for Korea to introduce the use of LNG. However, from a long term perspective, Korea has been expanding the use of LNG for environmental protection and diversification of energy sources. A comprehensive LNG promotion plan was developed in 1981 and the Korea Gas Corporation was founded in 1983 under this plan.

Demand for LNG began in earnest in 1987 and has since expanded at an average annual rate of 18%. Consumption of LNG is expected to continue increasing until the early 2000s, as the government maintains its focus on setting up a nationwide transmission pipeline network.

The transmission pipeline network for supplying LNG across the country was expanded from 242 km as of the end of 1990 to 2,413 km by the end of 2001, and is expected to reach 2,442 km by the year 2002.

Meanwhile, the construction of LNG receiving terminals, which began with just one such facility with three 100,000-kiloliter storage tanks in 1987, included two receiving terminals having 25 storage tanks by the end of 2001. By the year 2015, a total of three large-scale receiving terminals with 47 storage tanks are planned to be in operation.

A total of 6,947 billion Won had been invested by the end of 2001 in construction projects for the supply of LNG country-wide, and another 4,302 billion Won will be invested by the year 2015 for expanding the transmission pipeline network and building receiving terminals.

Trend of LNG Consumption

Country	The share of LNG in TPES (%)
Netherlands	45.8
Hungary	38.8
Ireland	39.6
United Kingdon	37.6
Italy	33.8
Canada	29.7
New Zealand	27.1
European Union	23.2
United States	23.7
Japan	23.3
Korea	**8.8**
OECD	21.6

LNG Terminal in Pyung-taek

3. Energy Technology R&D and NRSE

The Korean government is promoting development of technologies in four main fields: energy conservation technology, new & renewable energy technology, and clean energy technology. Koreas' R&D efforts are focused primarily on the development of energy conservation technology and new & renewable energy technology, taking into account their impact on CO_2 reduction

To achieve these objectives, the Korean government drafted the Ten-Year Energy Technology R&D Plan (1997-2006). The project envisioned by the plan, which will have cost a total of 2,047 billion Won since 1997, seeks to meet the following targets by the year 2006:

Goals

- reduce total expected energy consumption by 10%
- supply 2% of total energy consumption from new & renewable energy, including solar, wind and biomass energy, and
- secure clean technology for fossil fuels like coal and petroleum.

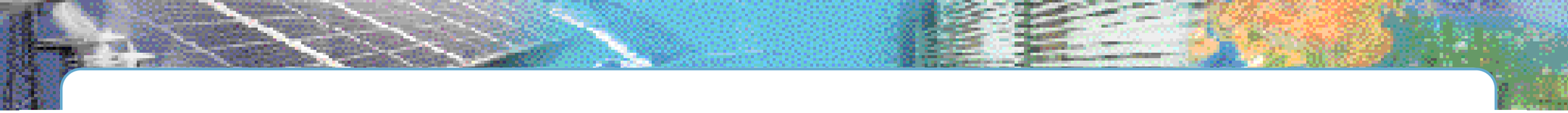
In March 2001, the Korean government also made public the " Basic Plan for Renewable Energy Technology Development and Dissemination".
The newly-established plan for NRSE has a target to attain 2% share of NRSE by the year 2003 through concentrated efforts on a small number of key technologies and mobilizing a multitude of initiatives to create markets and expand market size.

Solar Energy Park in Daejon

Diffusion of Energy Conservation and Efficiency Enhancement Technologies

The Korean government gives preference in public procurement to commodities produced using clean technologies, and is also implementing certification systems like energy-efficiency labeling. In addition, the diffusion of successfully developed technologies is being promoted through pilot projects in cooperation with the private sector.

Along with these efforts, the government is increasing financial assistance and tax benefits for the installation of energy facilities with demonstration projects to increase economic incentives for private investment in energy technologies.



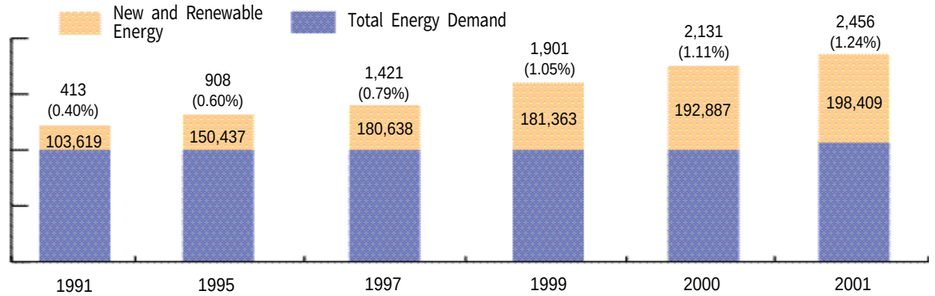
Development of New and Renewable Energy

Since the second oil crisis in 1978, the government has put great effort into developing and encouraging the use of indigenous new and renewable energy to reduce Korea's import-dependence on fossil fuels such as petroleum.

In 1987, the New and Renewable Energy Development & Promotion Act was adopted. The government has invested 174 billion Won(US$ 0.14 bil) in new and renewable energy R&D technologies, working with the private sector. From 1988-1998, investment was made for 367 projects in 11 research areas including photovoltaic power, fuel cells, bio energy and waste energy. As a result, the annual growth rate of new and renewable energy has been around 15% over the last ten years.

Currently, the government's initiatives for promoting the use of renewable energy include a portfolio of measures to lower intial installation costs. In particular, the government requires utilities to purchase electricity from renewable energy sources. This mandatory purchase is expected to substantially increase investments in renewable energy projects. In addition to this, a number of pilot projects are underway for the purpose of demonstration and performance tests. Also, Particular emphasis is placed on the establishment of Green Village, the program to demonstrate a sustainable and self-sufficient energy supply system.

New and Renewable Energy Consumption by Year



In terms of financial support, the government has since 1998 budgeted 277.8 billion Won(US$ 0.23 bil.) for developing new & renewable energy sources.

Financial Support for Expansion of New and Renewable sources(1988-2001)

(unit :100mil. Won)

	1988-1997	1998	1999	2000	2001	Total
Waste	51	59	27	36	21	656
Solar Energy	1,098	239	90	44	24	1,493
Small Hydro Power	217	12	16	9	10	264
Biomass	226	2	10	29	30	297
Wind & Others	68	-	-	-	-	68
Total	2,122	312	143	117	84	2,778
Average Won-US$ Exchange Rate			1,189.5	1,130.4	1,250	

4. New Policy to reduce Greenhouse Gas

Integrated Energy Policy (IEP) and national registry

The Integrated Energy Policy (IEP) is a new system which combines the public energy auditing program, the financial/technical support program and the national registry system for the promotion of the GHG reduction projects and the protection of the 'early action'. The main challenges are the identification of possible projects and the verification and recording of the result through registry system. During the 2nd comprehensive plan, most of the major industrial emitters will have a public or detailed energy audits and auditing report will open a new process of public loan and ESCO(Energy Service Company) supports. The Korean ESCOs are supported by public loans which covers the 50% of the project finance and thus the identified potential projects will be guided by the new IEP system. The registry system will help to convert the past 'reduction' into the initial allocation when the domestic emission trading is introduced, which will promote the early actions.

Introducing a Domestic Emission Trading System

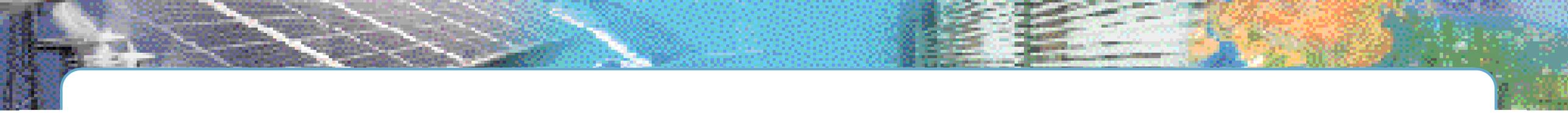
Domestic Emission Trading can be understood to be a new type of economic instrument which can be effective where the energy related tax is already high, and Korea is a case in point. In order to integrate the policy objective of de-carbonization, early introduction of domestic emission trading is reviewed and Korean energy policy is now facing a new challenge. Baseline approach and sectoral approach are two principles for this system.

In first phase, the power market will conduct a demonstration project for based on the'baseline matrix scheme' and in the next phase, other industries like refinnery, petro-chemical, and steel by electric furnace will constitute a new carbon market. In the last phase, the general emission trading market will be established where the government itself participate as a buyer to absorb the credit offered by the renewable energy and ESCO projects.

CDM(Clean Development Mechanism) hosting : enabling environment

The Korea government funds approximately $1 billion a year to finance energy saving and conservation projects in reliable social and economic environment. Technological additionality and economic additionality of the CDM projects can be easily achieved where the energy projects are considered as one of the major policy goal.

CDM Committee will be established as soon as the CDM is officially launched, as the national expert institutes are prepared for the documentation and the national criteria as well as the public support system for the energy project. Already some renewable energy projects and industry waste heat recovery projects are being reviewed in this process with overseas investors. As soon as the international guidelines for CDM are settled, the enabling environment for the CDM projects will be ensured by the related laws.



V. Challenges for the Future

Establishing a Less Energy Intensive Industrial Structure

For Korea, which relies on almost all of its energy needs on import, it is a national priority to improve the energy intensity of the industrial sector as a whole. Consequently, the government will seek to improve the energy efficiency of energy-intensive industries, and to foster less energy intensive and high value-added industries like bio-technology, information and communication technology.

Promoting An Environment-friendly Life Style

In order to reduce GHG more effectively, the Korean government plans to promote a more environmentally-friendly lifestyle among its people. The government is encouraging citizens to recycle energy-intensive raw materials, to use public transportation, and to participate in car pools. In June 2000, major Korean NGOs set up " The Korea Energy Network : Citizens ' Alliance for Energy Conservation "to coordinate an energy conservation campaign. As of October 2001, more than 255 NGOs were actively in the Korean Energy Network

Incorporating Social Cost into Energy Price

The Korean government plans to restructure the energy-pricing system in order to fully incorporate social costs such as environmental costs, on top of the direct costs of energy production. The government is seeking to win public acceptance of such adjustments and to build a consensus. in their favor. For example, the government is trying to introduce green pricing for new and renewable energy.

Moreover, construction of energy-efficient housing will be encouraged, along with the renovation of existing houses to drastically improve energy efficiency.

Establishing A Cleaner Community

The Korean government intends to actively implement policies to establish energy-efficient communities. Plans to support local governments that agree to work toward energy-efficient communities and to encourage participation are under way.

Moreover, construction of energy-efficient housing will be encouraged, along with the renovation of existing houses to improve energy efficiency drastically.

New Technology Development

CO_2 Conversion Technology

The Korean government will finance projects to develop new absorbent materials for the separation of CO2, optimize the absorption process, develop bench-sized absorbent mechanisms, develop technology to convert GHG to hydrogen, and develop clean-fuel manufacturing technology. Based on the result of these research efforts, it will begin to utilize CO2 separation & collection technology and transfer technology through demonstration plants.

Emission-Free Vehicles

GHG emissions in the transportation sector are expected to increase significantly. In order to minimize the expansion of such emissions, the Korean government plans to extend its support to ensure that the development of emission-free or low emission vehicles (e.g. electric cars, hybrid cars using fuel-cells, CNG cars) will be completed by 2002.

Advanced Nuclear Reactor Technology

A standard design for the advanced pressurized water reactor-1400 with greatly improved cost-effectiveness and safety was completed in 2001. These newly-buit advanced reactors will operate from 2010.

Active Participation in International Cooperation related to the FCCC

As a responsible member of the international community, Korea will commit to the global drive to prevent excessive global warming, and actively participate in FCCC-related international projects in order to effectively execute the related policies in line with global efforts.

UNFCCC, IPCC, OECD/IEA are among the multilateral organizations in which the Korean government will make dedicated efforts to promote energy saving. It will also make joint efforts with advanced countries such as the United States, the EU, and developing countries such as China in bilateral projects for the implementation of the above-mentioned commitments.

In April 2002, Korea hosted the UNFCCC Expert Meeting on methodologies for technology needs assessments, where about 100 experts from over 40 countries participated to discuss and streamline a technology transfer process. The meeting highlighted lessons learned from a variety of projects around the world.

Korea as an Attractive CDM Partner

Korea is an excellent CDM partner as stipulated under Article 12 of the Kyoto Protocol, especially in the following ways:

Implementing diverse and comprehensive GHG reduction programs

Korea is currently implementing GHG reduction programs such as development of energy-efficient technology, efficiency enhancement, use of LNG, use of new and renewable energy, etc. that have a high potential for being adopted as CDM projects in the near future, and which are currently being implemented globally, in particular, in the AIJ projects.

Government's Firm Commitment to GHG Reduction

As Korea relies on imports from overseas for 97% or more of its energy consumption, the Korean government is extending both financial and administrative support for the facilitation of GHG reduction projects as mentioned above.

Korean Companies' Long-standing Experience and Commitment

Because Korean insudtry is so energy-intensive, there is much room for energy conservation and GHGs reduction. At the same time, Korean companies are committed to and have longstanding experience in energy conservation and GHG reduction and are actively participating in the Voluntary Agreement program.

Investor-friendly Environment

The Korean government has established the legal and institutional basis for guaranteed repatriation of foreign investors ' revenues. Among 1,148 business types, 1,141 businesses including energy sector businesses are open (99.4%) to foreign investment, and the globalization of domestic financial market has been progressing rapidly.

Moreover, the real estate market has been open to foreigners since June 1998. Now, even non-resident foreigners may own real estate in Korea. In November 1998, the government enacted the Foreign Investment Promotion Act, which contributed significantly to simplified FDI procedures and increased investment incentives.

1. Energy Consumption Trend by Source & Sector

Year	TPES (Thou. TOE)	Source				Sector		
		Oil (Thou.B)	LNG (Thou.Ton)	Coal (Thou.Ton)	Nuclear (GWh)	Industry (Thou. TOE)	Res · Com (Thou.TOE)	Trans (Thou.TOE)
1970	19,678	62,702	-	11,580	-	-	-	-
1971	20,868	71,012	-	11,725	-	-	-	-
1972	21,291	73,381	-	12,206	-	-	-	-
1973	25,010	90,583	-	15,163	-	-	-	-
1974	25,763	94,002	-	15,774	-	-	-	-
1975	27,553	105,119	-	16,731	-	9,024	10,663	2,317
1976	30,193	118,966	-	18,368	-	10,765	10,875	2,524
1977	34,214	142,117	-	19,904	71	11,321	11,775	3,785
1978	38,088	163,147	-	20,122	2,324	12,869	13,114	4,569
1979	43,242	183,871	-	23,169	3,152	16,329	13,198	5,833
1980	43,911	182,105	-	25,862	3,477	16,382	14,118	5,109
1981	45,718	180,053	-	28,848	2,897	17,506	15,836	3,721
1982	45,625	178,894	-	29,369	3,776	17,354	15,197	4,216
1983	49,420	189,308	-	31,328	8,965	18,346	15,438	5,434
1984	53,535	191,049	-	37,004	11,792	19,508	17,342	6,007
1985	56,296	189,190	-	40,533	16,745	20,015	18,180	6,707
1986	61,462	200,591	54	42,878	28,311	21,865	18,605	7,699
1987	67,878	210,512	1,621	43,304	39,314	24,648	18,893	9,275
1988	75,351	250,558	2,094	45,906	40,101	28,200	19,700	10,747
1989	81,660	287,150	2,027	44,138	47,365	30,871	20,080	12,269
1990	93,192	356,348	2,329	43,405	52,887	36,150	21,971	14,173
1991	103,619	424,667	2,694	42,392	56,311	42,914	21,919	16,156
1992	116,010	514,224	3,524	39,814	56,530	50,825	23,008	18,531
1993	126,879	564,575	4,402	42,419	58,138	55,591	25,042	21,119
1994	137,234	621,498	5,860	42,660	58,651	59,908	25,968	23,860
1995	150,437	677,210	7,087	44,352	67,029	62,946	29,451	27,148
1996	165,212	721,065	9,363	50,277	73,925	67,868	31,713	29,792
1997	180,638	793,899	11,379	53,942	77,086	77,908	33,071	32,079
1998	165,932	670,278	10,645	55,892	89,689	76,039	27,418	26,184
1999	181,363	719,657	12,961	59,129	103,064	79,858	31,929	28,625
2000	192,887	742,557	14,557	66,524	108,964	84,119	32,418	30,945
2001	198,409	743,667	15,990	70,823	112,133	85,158	32,893	31,909

2. CO_2 Emission Trend by Sector

(unit: mil. TC)

Year	Total Emission	Industry	Transport	Res · Com	Transformation
1981	37,076	12,135	3,042	14,373	7,525
	(100)	(32.7)	(8.2)	(38.8)	(20.3)
1982	37,038	12,046	3,441	13,716	7,835
	(100)	(32.5)	(9.3)	(37.0)	(21.2)
1983	38,931	12,484	4,422	14,065	7,960
	(100)	(32.1)	(11.4)	(36.1)	(20.4)
1984	42,220	13,071	4,879	15,775	8,495
	(100)	(31.0)	(11.6)	(37.4)	(20.1)
1985	43,963	13,290	5,440	16,972	8,262
	(100)	(30.2)	(12.4)	(38.6)	(18.8)
1986	46,204	14,342	6,242	18,051	7,569
	(100)	(31.0)	(13.5)	(39.1)	(16.4)
1987	48,487	16,351	7,556	18,146	6,434
	(100)	(33.7)	(15.6)	(37.4)	(13.3)
1988	54,993	18,896	8,741	18,446	8,911
	(100)	(34.4)	(15.9)	(33.5)	(16.2)
1989	58,342	21,002	9,972	18,348	9,021
	(100)	(36.0)	(17.1)	(31.4)	(15.5)
1990	65,171	23,780	11,508	19,540	10,343
	(100)	(36.5)	(17.7)	(30.0)	(15.9)
1991	71,616	27,600	13,130	18,748	12,139
	(100)	(38.5)	(18.3)	(26.2)	(17.0)
1992	78,006	30,248	15,056	18,422	14,280
	(100)	(38.8)	(19.3)	(23.6)	(18.3)
1993	85,735	33,292	17,163	18,974	16,306
	(100)	(38.8)	(20.0)	(22.1)	(19.0)
1994	92,992	34,918	19,376	18,505	20,194
	(100)	(37.5)	(20.8)	(19.9)	(21.7)
1995	100,056	36,226	22,923	20,259	22,649
	(100)	(36.2)	(20.9)	(20.3)	(22.6)
1996	111,308	38,768	24,196	21,241	27,103
	(100)	(34.8)	(21.7)	(19.1)	(24.3)
1997	116,935	41,256	23,565	21,446	30,668
	(100)	(35.3)	(20.2)	(18.3)	(26.2)
1998	100,834	38,426	19,980	16,563	25,865
	(100)	(38.1)	(19.8)	(16.4)	(25.7)
1999	109,954	40,107	21.811	19,377	28,660
	(100)	(36.5)	(19.8)	(17.7)	(26.1)
2000	117,985	41,799	23,629	18,425	34,113
	(100)	(35.4)	(20.0)	(15.6)	(28.9)

Note : share in the parentheses