

# Energy Policies of Korea

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## I. Status of Korea's Energy Policy

### 1. Developments in Energy Policy

Throughout the years, the goal of Korea's energy policy has shifted from ensuring a stable supply of energy to achieving sustainable development, in due consideration of the changing internal and external conditions.

In order to maintain the high economic growth rate of the 1970s, energy supply policies centered on oil, which was relatively easy and cheap to purchase.

However, two rounds of oil crisis significantly impacted the national economy, and new policies have been pursued since the 1980s to establish a stable supply and demand system, including the diversification of energy supply sources and expanding the energy supply infrastructure.

With international oil prices stabilizing and domestic energy supply and demand system being firmly instituted in the early 1990s, policies to strengthen market functions in the energy sector was promoted. Accordingly, the market was significantly deregulated and rationalization was pursued in the coal industry.

From the late 1990s, restructuring of the energy sector was pursued in full-scale with the introduction of the principle of free competition to such utility industries as electricity and gas which had been considered natural monopolies. Furthermore, initiatives forwarded by the United Nations Framework Convention on Climate Change have spurred strengthened environmental regulations. As a result, sustainable development has emerged as the focal point of Korea's recent shift in energy policy, with full consideration of the 3E (energy, economy, environment).

### 2. Major Achievements of Energy Policy

#### (1) Expansion of Energy Supply Facilities and Networking of the Energy Industry

In spite of the surging domestic energy consumption, Korea has been able to maintain a stable supply of energy through continued expansion of energy supply facilities. Furthermore, an advanced energy supply and demand system was established as the result of expanded network of the supply base for electricity, petroleum, city gas, and thermal energy.

- Electricity supply reserves: 17.1% (in 2003)
- Oil stockpiling : 103 days (as of the end of November 2003)
- Natural gas pipelines: 2442 km (as of the end of 2002)
- Oil pipelines: 1081km (as of the end of August 2003)

#### (2) Stabilization of the Demand for Energy

Due to various efforts to enhance energy efficiency, energy intensity and GDP elasticity of energy demand have continuously declined from 1997. In particular, with the transformation of the industrial structure that features less energy-consuming types, energy intensity and GDP elasticity of energy demand are improving.

Furthermore, the nation's dependence on oil has dropped to below 50% at the end of 2002, thanks to the government's efforts toward energy diversification.

### (3) Commencement of Restructuring the Energy Industry

With the establishment of the plan to privatize state-owned companies in the late 1990s, privatization and restructuring of the energy sector were pursued in full-scale including electricity, gas and integrated energy supply businesses.

Accordingly, the Basic Plan for Restructuring the Electricity Industry was established in January 1999, and related legislation was passed by the National Assembly in December 2000. The objectives of restructuring include promoting efficiency of electricity supply, securing a stable supply of electricity on a continual basis, and expanding choices made available to consumers in the use of electricity.

The Basic Plan for Restructuring the Gas Industry was established in November 1999. Subsequently, a detailed plan was finalized and related legislation was submitted to the National Assembly in August 2001. The restructuring aims at boosting the efficiency of resource allocation and management of the gas industry. It also seeks to modernize the industry, improve the quality of its service and expand choices for consumers.

### (4) Development of Domestic and Overseas Resources

As of the end of September 2003, a total of 148 resource development projects are being pursued overseas including the 15-1 block in Vietnam. The projects are producing tangible results including the successful development of the 15-1 oil field in Vietnam and the Continental Shelf Donghae-1 Gas Field.

Korea will continue to invest in developing overseas oil fields and mineral resources. It will participate in an oil field development project in the Caspian Sea and mineral resources development project in western China.



## II. Status and Outlook of Domestic Energy Consumption

### 1. Energy Consumption Trends

Total primary energy consumption increased 4.8 fold from 43.9 million TOE in 1980 to 208.6 million TOE in 2002. In particular, energy consumption from 1990 to 2000 increased by an annual average of 7.5%, far exceeding the economic growth rate of 6.2% during the same period.

Likewise, per capita primary energy consumption grew from 1.2 TOE in 1980 to 4.4 TOE in 2002. This is a level similar to that of Japan and most European countries.

Energy intensity improved somewhat from 0.37 (TOE/million won) in 1981 to 0.35 in 1990, but increased by an annual average of 1.4% after 1990 to record 0.40 in 2000.

	1980	1999	2000	2001	2002	2003(e)
Total primary energy consumption (1,000,000 TOE)	43.9	181.4	192.9	198.4	208.6	216.6
Per capita primary energy consumption (TOE)	1.2	3.9	4.1	4.2	4.4	4.5
Final energy consumption (1,000,000 TOE)	37.6	143.1	149.9	152.9	160.5	163.6
GDP elasticity of energy consumption	0.71	0.85	0.68	0.97	0.84	0.97
Energy intensity (TOE/million won, as of 1995)	0.38	0.41	0.40	0.40	0.40	0.40
Oil dependence (%)	61.1	53.6	52.0	50.6	49.1	47.4

## 2. Energy Consumption by Source and Sector

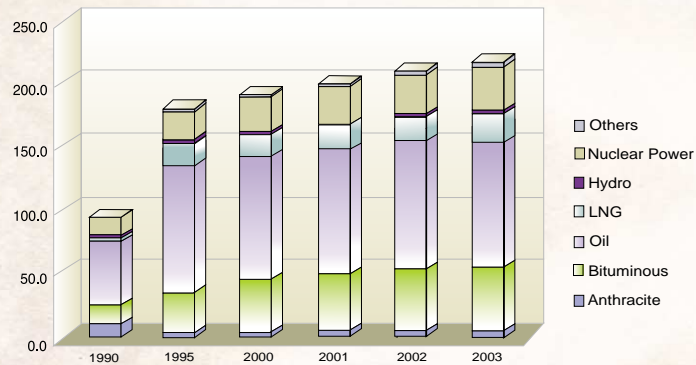
### (1) The Share of Energy Consumption by Source

The share of oil in total primary energy consumption dropped to below 50% from 2002, as consumption of LNG increased, which means that the fuel switching is taking place from oil to LNG and other energy sources.

Furthermore, increase in income levels has spurred higher demand for electricity. Such increased demand for electricity has resulted in a higher demand trend for bituminous coal and nuclear power.

(Unit: %)

	'80	'98	'99	'00	'01	'02	'03(e)
Oil	61.1	54.6	53.6	52.0	50.6	49.1	47.4
LNG	-	8.4	9.3	9.8	10.5	11.1	11.8
Coal	Anthracite	22.5	1.3	1.4	1.6	1.9	2.1
	Bituminous coal	7.6	20.4	19.7	20.7	21.2	21.6
Hydro	1.0	0.9	0.8	0.7	0.5	0.6	0.7
Nuclear power	2.0	13.5	14.2	14.1	14.1	14.3	14.9
Others	5.7	0.9	1.0	1.1	1.2	1.4	1.5



### (2) The Share of Energy Consumption by Sector

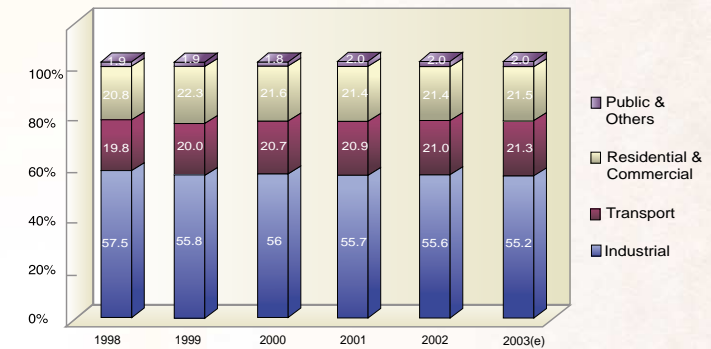
Since the mid-1990s, low-energy-consuming industries such as information and telecommunication have increased their shares in the economy. As a result, energy consumption in the industrial sector has stabilized and its portion of overall energy consumption is gradually decreasing.

In the transportation sector, energy consumption has gradually expanded in accordance with increase in the number of cars.

As for the residential and commercial sectors, energy consumption in these sectors is expected to expand gradually as income level continues to rise, homes expand in space, home appliances get bigger, and service industries grow rapidly.

(Unit: %)

	'80	'98	'99	'00	'01	'02	'03(e)
Industrial	61.1	57.5	55.8	56.0	55.7	55.6	55.2
Residential & Commercial	40.7	20.8	22.3	21.6	21.5	21.4	21.5
Transport	9.6	19.8	20.0	20.7	20.9	21.0	21.3



### 3. Energy Consumption Projections

Total energy demand is expected to increase by an annual average of 3.1% from 2001 to 2010 and by an annual average of 2.4% from 2001 to 2020 to reach 311.8 million TOE in 2020. Per capita energy demand, which stood at 4.1 TOE in 2000, is forecast to increase to 5.3 TOE and 6.2 TOE in 2010 and 2020, respectively.

Energy intensity, which was 0.40 in 2000, is expected to fall to 0.34 in 2010 and 0.27 in 2020. This is because the growth rate of energy demand is expected to remain lower than the rate of economic growth.

GDP elasticity of energy demand is also expected to drop from 0.62 during the period of 2000~2010 to 0.53 during the period of 2000~2020.



As for energy demand by source, oil consumption is expected to increase by annual average of 2% or more by 2010. Furthermore, dependence on the Middle East for oil is expected to deepen. Therefore, stabilizing the import of oil will continue to remain a key task in Korea's energy policy.

Gas supply is more stable as compared to the oil supply since it is deposited widely around the globe and its reserves are relatively abundant. With the environment becoming an issue of ever growing social significance, gas is gaining wide recognition as a cleaner fuel. Accordingly, global consumption of gas is expected to increase. At the same time, domestic consumption of gas is expected to increase rapidly.

New and renewable energy is expected to sharply increase its share in Korea's energy mix due to globally-strengthened environmental regulations. However, as such proportion is expected to be significantly lower than the global average, the government will continue to make efforts to increase the share of new and renewable energy within Korea's energy mix.

Electricity demand will continue to grow as people demand high-quality energy. Thus, it is forecast that there will be a need for expanding the basis for providing a stable and sufficient supply of electricity.



### III. Korea's Energy Policy Direction

#### 1. Change in Policy Goals

Until now, the primary goal of Korea's energy policy has focused on ensuring a stable energy supply to sustain economic growth and maintain a quality lifestyle of citizens. However, changing internal and external conditions have induced the government to seek a new direction in energy policy that supports sustainable development in full consideration of the 3E.

#### 2. Direction of Energy Policy for Sustainable Development

##### (1) Energy Security

Korea is highly dependent on foreign sources for its energy needs. In particular, its high reliance on the Middle East for oil and natural gas makes Korea vulnerable to international energy crisis.

In response, the Korean government has promoted a policy of decreasing the dependence on petroleum and increasing the use of LNG, nuclear energy and bituminous coal in an effort to stabilize energy supply. Furthermore, stability in supply is continuously promoted by lowering the risks attendant with fluctuations in supply volume and price through diversification of the supply channels for oil and natural gas.

The government also plans to strengthen the foundation of energy supply by continuing to expand energy facilities for LNG supply and power generation.



Meanwhile, plans are being formulated to actively promote overseas resource development projects. As of September 2003, Korea is involved in a total of 275 projects, with 148 projects currently in progress. In particular, development efforts will focus on developing oil and gas fields in Central Asia centering on the Caspian Sea, Russia including Siberia, as well as Central and South America.

The Korean government plans to strengthen international cooperation to reinforce energy security. It plans to engage in bilateral cooperation as well as take part in multilateral cooperation through the IEA, APEC EWG, ASEAN+3, IEF and ECT, so as to promote energy security and enhance crisis management capabilities. In particular, the government plans to play a leading role in energy resource development and trades in Northeast Asia by creating the Collaborative Framework on Energy Cooperation in Northeast Asia.

##### (2) Market Efficiency through Competition

In the past, the primary goal of the government's energy policy has focused on ensuring a stable energy supply. As such, the government was heavily involved in determining energy supply and demand and energy prices, while competition in the energy market was rather limited.

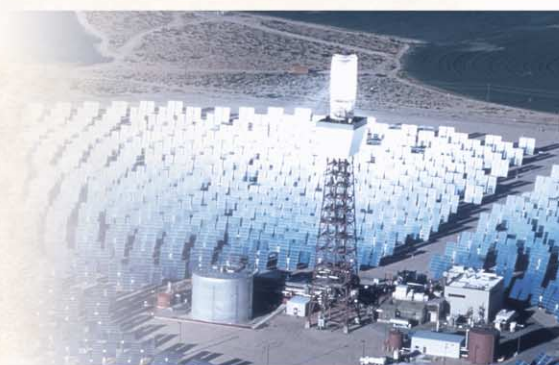
The government plans to correct distortions in prices among energy sources in order to vitalize the price functions of the energy market and promote fair and efficient competition. As a first step, the government will finish adjusting the relative price of petroleum products by June 2006.

Furthermore, in order to promote efficiency in the energy market, the government plans to pursue restructuring of the energy industry and gradually introduce competition in stages.

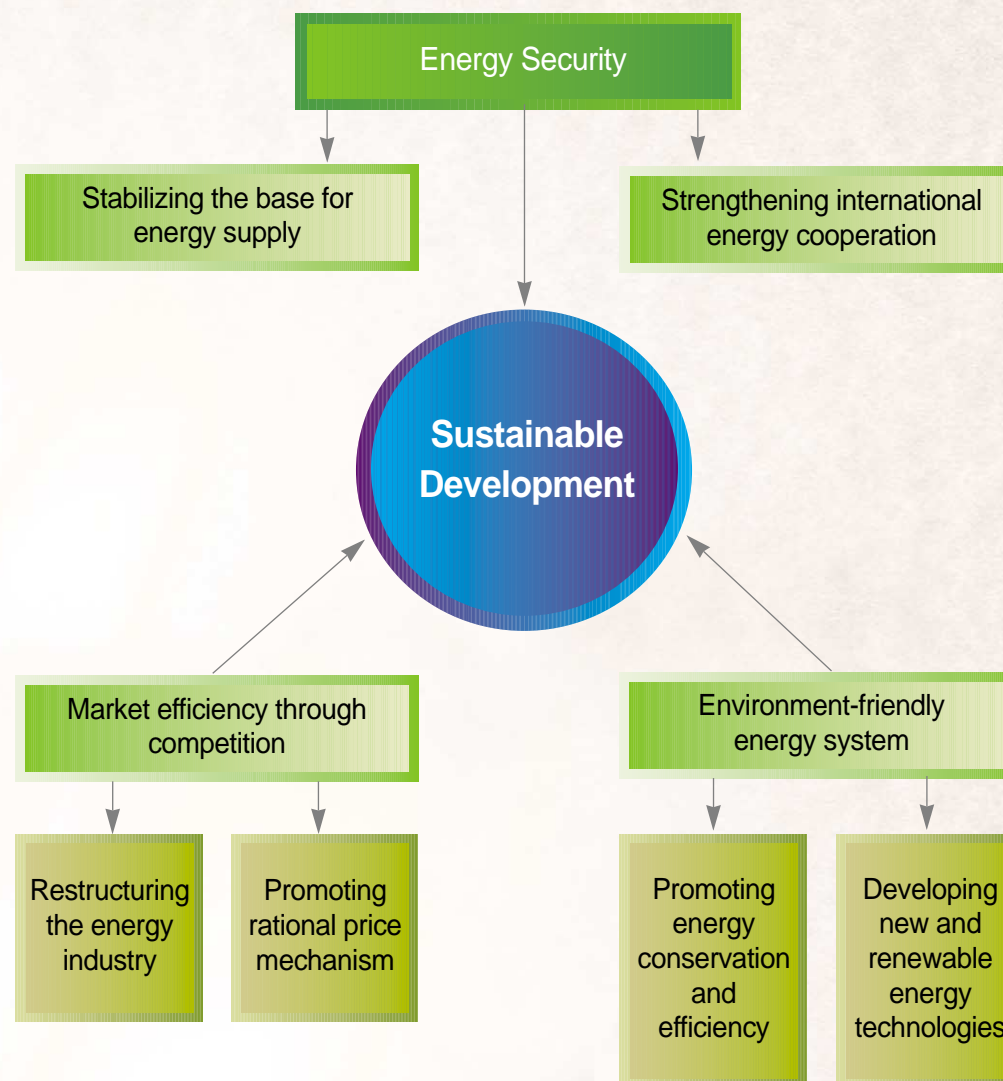
### (3) Environment-Friendly Energy System

The Korean government plans to establish an environment-friendly, low-carbon energy consumption system. First, policies to conserve energy and enhance efficiency will be actively pursued. In addition, the share of nuclear power will be maintained at a certain level in the power generation sector. In the household, commercial and industrial sectors, petroleum will be replaced by natural gas and LPG. The government also plans to actively develop new and renewable energy technologies so as to enhance energy security and to promote provision of environment-friendly energy.

Meanwhile, in response to strengthened global regulations on environment such as the United Nations Framework Convention on Climate Change, the Korean government will prepare measures to reduce greenhouse gases. Such measures will reflect the nation's economic and industrial structure. As a mid-to-long term goal, the government plans to promote a shift into an economy with low emission of greenhouse gases.



### [Goal and Direction of Korea's Energy Policy]





## IV. Major Policy Tasks

### 1. Response to the United Nations Framework Convention on Climate Change

Korea signed and ratified the United Nations Framework Convention on Climate Change (UNFCCC) in December 1993 and ratified the Kyoto Protocol in November 2002.

Recognizing that energy conservation and greenhouse gas reduction conforms to the direction of international cooperation efforts and Korea's long-term economic development, the Korean government has taken the initiative to pursue various measures and policies to reduce emission of greenhouse gases in various sectors. In particular, the government is taking part in international efforts to curb global warming by accelerating the conversion into low-energy-consumption industries and strengthening energy conservation efforts.



Greenhouse gas reduction efforts in the energy sector are focused on energy demand, energy supply, building and transportation fuel.

In the energy demand sector, greenhouse gases are reduced through energy conservation policy focusing on integrated management and energy efficiency improvement.

In the energy supply sector, policies related to expanding the use of new and renewable energy and cleaner energy are pursued.

In case of the building sector, energy efficiency improvement in buildings is being pursued to reduce greenhouse gases. Also, as for the transportation fuel sector, such measures as using cleaner fuel and promoting lighter cars are being pursued.

In order to promote these measures in a systematic manner, the Korean government established the Inter-Ministerial Committee on UNFCCC in April 1998. Then, the committee was expanded and modified through an official order from the Prime Minister in September 2001.



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## 2. Promoting Market Functions of the Energy Industry

### (1) Restructuring the Electricity Industry

#### Current Status

In a move to introduce competition to the electricity industry, which has traditionally been maintained under the public monopoly system, the government announced the Basic Plan for Restructuring the Electricity Industry in January 1999.

Main points of the basic plan include the introduction of competition in three stages to the generation sector, wholesale sector and retail sector. In April 2001, the generation sector of KEPCO (Korea Electric Power Corporation) was split into six companies (five thermal generation companies and Korea Hydro & Nuclear Power Co., Ltd.). Thus, there is *de facto* competition in the generation sector of the electricity industry.

#### Future Plans

The five thermal generation companies split from KEPCO will be privatized in stages. Currently, privatization is in progress for the first of the five companies, Korea South-East Power.

Furthermore, competition will be introduced in the wholesale sector in the 2nd stage. To accomplish this, a committee comprising members of labor, management and government has been created to review splitting distribution/sales sector from KEPCO. The committee is conducting joint studies on measures for rational reform.

Because the energy transmission sector is a nation-wide network industry and a certain monopolistic structure unavoidable, the public utility system will continue to apply as originally planned to ensure stable electricity supply.

### (2) Restructuring the Gas Industry

#### Current Status

Korea Gas Corporation (KOGAS) has monopoly over Korea's gas industry including import, storage, transport and wholesale businesses. Also, 32 city gas companies monopolize the gas retail business in each region of the country.

In a move to eliminate factors that limit competition in the gas industry and to pursue privatization, the government announced the Basic Plan for Restructuring the Gas Industry in November 1999. After that, the relevant legislation was submitted to the National Assembly in November 2001 and a hearing was held by the National Assembly in May 2002.

#### Future Plans

The government plans to enact the relevant law on restructuring based on agreement by labor, management and government.

With regard to introducing competition into KOGAS's import/wholesale sectors, the final decision will be made on whether to split the sectors from KOGAS or to introduce new companies, following sufficient discussion among interested parties.

Given the strong public interest nature of the facilities sector, the existing public utility system will be maintained. Such measure is expected to resolve concerns regarding job security, promote public interest in the network industry, and prevent problems resulting from redundant investments.

As for the retail sector, which is currently operated under a monopoly system by each region, competition will be introduced in stages, in consideration of the progress made in the wholesale sector to accommodate competition.

### (3) Reforming the Relative Price System of Petroleum Products

The Korean government plans to reform the relative price system of energy sources to promote energy conservation and to convert into a low-energy-consumption economy by rationalizing the price level of energy sources.

First, price reform will be implemented in six stages from July 2001 to July 2006, with the goal of adjusting the relative price of petroleum products to the level of non-oil producing countries of the OECD.

As for fuel for the transportation sector, taxation on LPG will be increased significantly in order to prevent a rapid increase in the number of LPG vehicles. As to oil for use by the household sector, relative price of kerosene will be adjusted in order to prevent fuel from being allocated from the household sector to the transportation sector and to promote a stable lifestyle of citizens. As for fuel used by the industrial sector, relative price of heavy oil will be adjusted slightly upwards in light of industrial competitiveness and environmental protection.

#### Relative Price Adjustment Plan

(Unit: Relative price when gasoline is set at 100)

	Transportation Sector		
	Gasoline	Light oil	LPG
July 2000	100	47	26
July 2006	100	75	60

### 3. Development and Dissemination of New and Renewable Energy Technologies

The Korean government plans to increase the share of new and renewable energy to 5% in total primary energy consumption by 2011. However, as of 2002, the share stood at approximately 1.4%, which is quite low compared to that of other advanced countries. In addition, there has been insufficient investments in the development of new and renewable energy technologies and a lack of support for disseminating such technologies.

#### Supply Share of New and Renewable Energy by Source (2002)

	Waste	Bio	Solar	Small Hydro	Photovoltaic	Wind power
Share (%)	93.5	4.0	1.2	1.0	0.2	0.1

Accordingly, the government established the Basic Plan on Developing and Disseminating New and Renewable Energy Technologies in September 2003 and set specific plans and goals by year.

To develop new and renewable energy technologies, the Korean government selected three major areas which have viable market potential such as hydrogen fuel cell, photovoltaic, and wind power, and plans to concentrate support in such areas. In addition, the government will develop hydrogen fuel cell, the next generation energy source, as a growth engine for the nation and establish the foundation for moving towards a hydrogen economy.

To disseminate new and renewable energy, the government also plans to strengthen support for that. As of the end of 2003, the number of Green Villages that are energy self-sufficient thanks to new and renewable energy has been increased to five. Also, the government will make it mandatory for installment of new and renewable energy facilities when a public building that exceeds a certain size is newly constructed.

#### 4. Collaborative Framework on Energy Cooperation in Northeast Asia

Northeast Asia is a region endowed with abundant natural resources, accounting for a significant part of the world's energy resources with 33% of the natural gas, 32% of coal, and 8% of petroleum. Furthermore, large energy consumers such as Korea and Japan, which account for 20% of global energy consumption, are located in the region. Thus, Northeast Asia is a resource-rich as well as a big energy-consuming region.

Korea's dependence on the Middle East for oil stands at more than 76%. As such, Korea's supply and demand structure is highly vulnerable to energy crises. To overcome such vulnerability and to secure a stable supply of energy in consideration of the increased energy consumption in the future, the Korean government is actively pursuing energy cooperation in Northeast Asia. In the future, Korea plans to diversify energy sources by developing such energy resources as petroleum and gas in the region and laying pipelines for transporting these resources.

First, the Korean government will form the Senior Officials Committee for Energy Cooperation in Northeast Asia to create consensus among countries within the region for energy cooperation. In the long term, the Collaborative Framework on Energy Cooperation in Northeast Asia will be created.

Furthermore, the Northeast Asia Energy Research Center will be established in Korea to conduct joint studies on possible projects that may be pursued in collaboration by countries in the region and to manage relevant materials and data so as to lay the foundation for energy cooperation in Northeast Asia.

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## Organizational Chart of MOCIE

