The 1st Basic Plan of Long Term Electricity Supply & Demand

2002 – 2015

August 2002

Unofficial English translation based on 「The 1st Basic Plan of Long Term Electricity Supply & Demand」 that was determined by the Korean Government on August 17, 2002.

KPX KOREA POWER EXCHANGE

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1. Background

A. Legal Background

○ The 1st Basic Plan of Long Term Electricity Supply & Demand (BPE) is produced pursuant to Article 25 of the Electricity Business Act(EBA) and Article 15 of the Electricity Business Presidential Decree. The EBA stipulates that the Ministry of Commerce, Industry and Energy(MOCIE) produce the BPE on a biennial basis.

B. Changed Environments

○ Before electricity industry restructuring, the government had established a Long Term Power Development Plan (LPDP) and the Korea Electric Power Corporation (KEPCO), a vertically integrated utility, had implemented the LPDP in order to secure a stable electricity supply.

○ The Korean government decided to gradually restructure the electricity supply industry(ESI) in order to increase the efficiency of the industry and to promote consumer rights.

○ With the ESI restructuring, the competitive market mechanism will be the dominant factor. Thus, the function of the former Long Term Power Development Plan (LPDP) has inevitably changed into non-binding guidelines or reference.

< Milestones of Korean ESI Restructuring>

◇ Generation Competition (2001-2003) : Separation and privatization of KEPCO's generation assets and the introduction of competition in the generation sector

◇ Wholesale Competition (2004-2008) : Separation and privatization of KEPCO's distribution assets and the introduction of competition in wholesale electricity supply

◇ Retail Competition (after 2009) : Introduction of competition in retail electricity supply

○ The Korean government, in consultation with the KPX, biennially establishes the Basic Plan of the Electricity Supply & Demand (BPE) just as it has prepared the Long Term Power Development Plan. However, the BPE will be established not as a binding force but as a tool providing market participants with appropriate information and market based solutions.

Figure 1.1 The Changes in the Government's Long Term Planning

Before Electric Restructuring		After Electric Restructuring
◦ The Long Term Power Development Plan (LPDP) ◦ Government and KEPCO's centralized plan - Focusing on public benefit, monopoly and coercion	→	◦ The Basic Plan of the Electricity Supply & Demand (BPE) ◦ Diversified plan - Focusing on private profit, competition and autonomy

2. Characteristics and Procedures

A. Characteristics of the BPE

○ The BPE presents national policy on the electricity supply & demand and provides market participants with appropriate information for the successful operation of the electricity market.

○ The Korean government will make every effort to implement the BPE by referencing the BPE in licensing the electricity business and preparing further measures for stable electricity supply.

B. Procedures

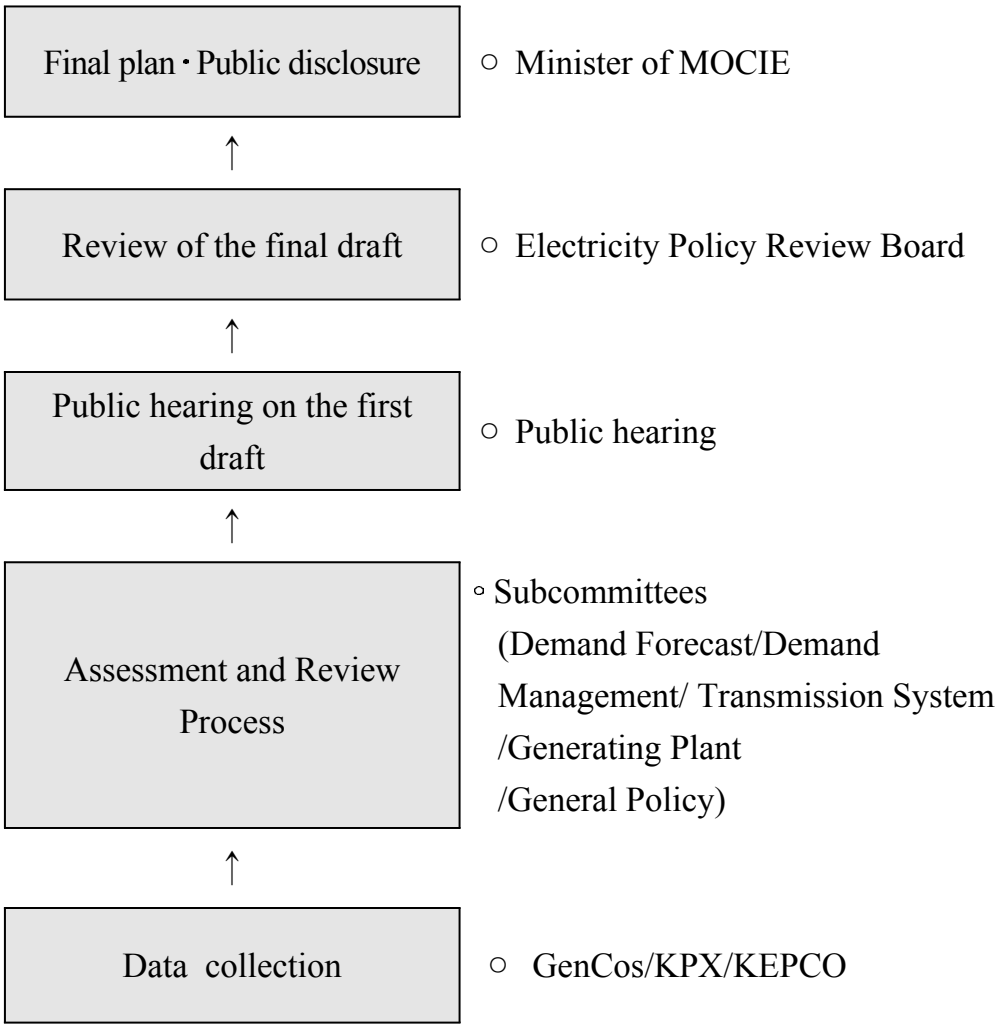
○ The information used to produce the BPE is based on data provided by generating companies, KEPCO and the Korea Power Exchange (KPX). Generation companies provide their expectation of the future generation, KEPCO provides its expectation of transmission system expansion, and KPX provides its expectation of the projected demand.

○ With collected data, five subcommittees; Demand Forecast, Demand Side Management, Transmission System, Generating Capacity and General Policy, make assessment and review for acceptability in each field. Experts from each field participate in the assessment and review process.

○ A draft plan is prepared in pursuant to the results of each subcommittees' assessment and review and comes up for public hearing. The opinions and ideas raised in the public hearing are reflected in the final draft plan.

○ Prior to the Ministry of Commerce, Industry and Energy's releasing the BPE, the Electricity Policy Review Board makes a final review.

Figure 1.2 The BPE Establishment Procedure



3. Milestones

< Basic Direction of the 1st BPE>

◇ Planning Period : 2002 to 2015 (14 years)

◇ Re-forecast mid and long term electricity supply and demand environment.

◇ Stabilize the electricity supply and demand by market function and by electricity businesses' autonomous plan

◇ Prepare measures to secure stable electricity supply during the transition period into the full market competition.

○ In May 2001, works for the preparation of the 1st BPE began.

○ Over the last year, the government has prepared the first draft of the 1st BPE based on the 'Survey on Generating Capacity Addition & Retirement' and the result of five subcommittees' assessments and reviews.

○ A reference capacity expansion guideline including appropriate plant mix and reserve margin has been prepared as a national target.

▪ The Demand Forecast subcommittee re-forecasts mid and long term electricity supply and demand environment with consideration of changes in national economy following the establishment of the 5th Long-term Power Development Plan and changed environments, which came about after the Korean electricity industry restructuring.

- A Survey on Generating Capacity Addition & Retirement was made twice in July and October 2002 and the proposed capacity additions and retirements were categorized so as to prepare the 'Most Probable Plan'.

※ Participants in the Survey : KEPCO, 6 GenCos, private investors

- The basic direction for the establishment of the 'Mid and Long Term Transmission/Distribution Expansion Plan' was determined on the basis of regional electricity supply and demand projection.
- A comprehensive projection on future electricity demand and supply was made.
- 'Mid and Long Term Measures for Stable Electricity Supply and Demand' was developed in order to secure stable electricity supply during the transition period. It includes measures for generating, transmission and distribution capacity expansion and for the promotion of the market function.

○ Public hearing on the first draft of the 1st BPE was held on the 20th of May, 2002.

○ Review on the final draft of the 1st BPE was performed by the Electricity Policy Review Board on the 4th of July, 2002.

4. Recent Electricity Trends

A. The Recent Electricity Supply and Demand Trend

○ Electricity demand has grown very rapidly in line with the country's high economic growth and the increase in the standard of living over the last 30 years as well as electricity's inherent convenience of use. In 2001, a peak demand of 43,125㎿ and electricity sales of 285TWh ranked Korea seventh among OECD countries.

○ During the 1990s, the average growth rate of electricity consumption was 9.8% per annum, a figure exceeding that of total energy consumption at 7.5% per annum. Demand actually fell 3.6% in 1998 due to the Asian economic crisis but recovered in 1999, recording an 11.3% increase.

○ Continuous construction of generating plants and the promotion of demand side management has enabled a stable electricity supply in spite of such a high demand growth.

▪ Although there was no severe shortage of electricity supplying capacity, the Korean electricity system experienced periodic excesses and shortages of generating capacity. Generating capacity was excessive in the 1980s, appropriate in the early 1990s, short in the mid 1990s and was stabilized following the Asian economic crisis in 1998.

- Electricity quality in areas such as voltage stability, frequency and outage time has been maintained equal to that of advanced countries. Electricity rates have also been maintained relatively low in comparison with other countries.
- While the producer price index increased 93.6% between 1980 and 2000, electricity rates increased by only 46.7%.

Table 1.1 Recent Electricity Supply and Demand Trends

	1980	1990	1995	1997	1998	1999	2000	2001
Peak Load (MW)	5,457	17,252	29,878	35,851	32,996	37,293	41,007	43,125
Generating Capacity (MW)	9,391	21,021	32,184	41,042	43,406	46,978	48,451	50,859
Reserve Margin at Summer Peak (%)	72.1	21.8	6.4	13.1	31.1	19.1	16.8	15.1
Nominal Electricity Rate (Won/kWh)	50.88	52.94	61.28	65.26	72.08	71.59	74.65	77.06

B. Electricity Supply and Demand Outlook

○ Electricity Supply and Demand Outlook

- Electricity demand is expected to increase continuously with economic growth, but increased concern about the environment and excessive claims for damages deteriorate the electric companies' ability to acquire the lands for electric facility construction.

※ Korean per capita electricity consumption was 5,523㎾h in 2000, which is 43% of the USA(12,834㎾h, 1998) and 73% of Japan.(7,557㎾h, 1999)

▪ With the introduction of competition in the electricity market, the electricity supply and demand balance will gradually transit into the market function.

○ Energy supply and demand outlook (Korea Energy Economics Institute)

▪ World energy demand is projected to increase averagely 2.3% per annum until 2020. (Oil 2.2%, natural gas 3.2%, coal 1.8% and nuclear 0.5%)

▪ Domestic energy demand is expected to increase averagely 3.0% per annum until 2020. (Oil 2.3%, natural gas 5.3%, coal 2.6% and nuclear 3.8%)

○ Fuel supply and demand and environment regulation outlook (DOE/EIA)

▪ Unstable supply prevails because of finite energy resources (oil 40 years, natural gas 60 years, coal 217 years, uranium 50 years) and regional misdistribution.

▪ International and national environmental regulations are expected to be strengthened continuously, and pressure on the obligatory greenhouse gas reduction is expected to be increased with the progress of climate change convention.

Ⅱ. Mid and Long Term Electricity Demand Forecast

1. Assumptions and Methodology
2. Demand Side Management Plan
3. Electricity Demand Forecast

1. Assumptions and Methodology

A. Assumptions

○ Economic growth rate : 3.0% in 2001 and an average 4.9% per annum between 2001 and 2015(Korea Development Institute)

○ Industrial structure : the share of service sector increases while that of mining and manufacturing sector decreases(Korea Institute for Industrial Economics and Technology).

▪ Share ('00→'15) : mining and manufacturing(34.5%→28.5%), service (60.3%→69.3%), agriculture and fishery(5.2%→2.2%)

Table 2.1 Assumptions in Electricity Demand Forecastingg

Year		2000	2001	2002	'01～'05	'06～'10	'11～'15	'01～'15
GDP (%)		8.8 (4.7)	3.0 (6.0)	5.0 (6.1)	5.1 (5.8)	5.1 (5.2)	4.5 (4.4)	4.9 (5.1)
Industry Structure (%)	Class	**2000**	**2001**	**2002**	**2005**	**2010**	**2015**	
	Agriculture & Fishery	5.2 (5.3)	-	-	3.9 (5.2)	2.7 (4.9)	2.2 (4.5)	
	Mining & Manufacturing	34.5 (30.0)	-	-	33.1 (30.8)	29.0 (30.6)	28.5 (30.0)	
	Manufacturing	34.2 (29.8)	-	-	33.0 (30.6)	29.0 (30.6)	28.5 (29.9)	
	Service	60.3 (63.6)	-	-	63.0 (64.0)	68.3 (65.2)	69.3 (66.6)	
Electricity Rate ('00=100)		100	100.2 (99.7)	100.8 (99.7)	102.2 (99.2)	98.3 (96.8)	96.0 (94.4)	

※ Values in parenthesis are those applied in the 5th LPDP.

○ Electricity rates : current rates level is maintained until the privatization and will then be lowered.

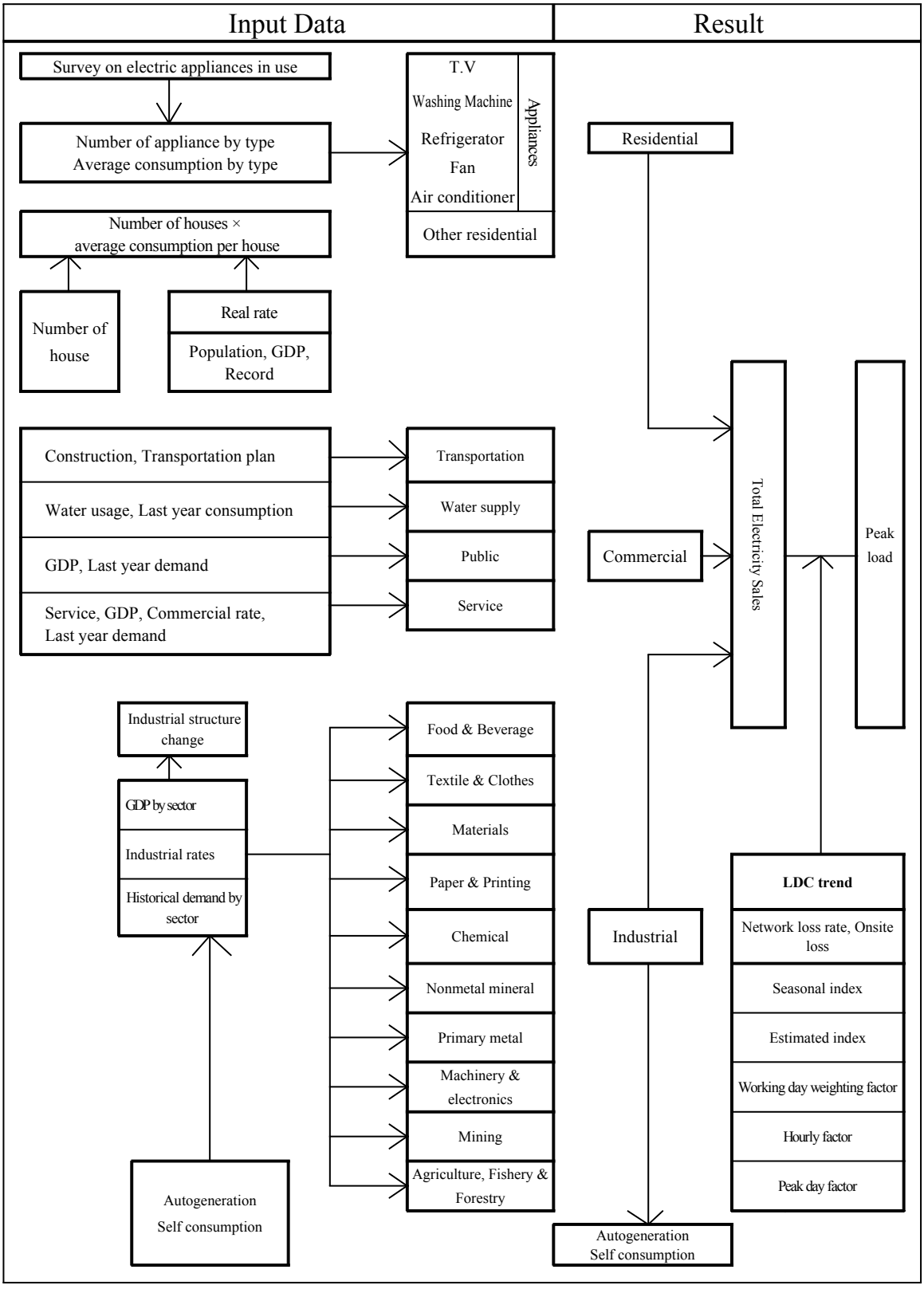
- Electricity rates projection : 100 in 2000(reference) → 102.2 in 2005 → 98.3 in 2010 → 96.0 in 2015

B. Forecasting Methodology

○ The Korea Power Exchange forecasted electricity demand in consultation with Seoul National University and experts in various fields.

- Electricity sales are forecasted by sector (2 residential sectors, 4 commercial sectors and 10 industrial sectors) with use of both the microeconomic and macroeconomic forecasting methods.
- Peak loads before demand side management are forecasted with consideration of historical seasonal, daily and hourly load patterns.
- Peak loads after demand side management are forecasted with consideration of the demand side management target. Low and high electricity demand forecast scenarios are made reflecting uncertainties in future electricity demand growth.

Figure 2.1 Electricity Demand Forecasting Procedure



2. Demand Side Management

A. Status of Demand Side Management

○ Since 1990, various demand side management (DSM) programs have been implemented to alleviate burdens on financing, siting and environmental impact that could be caused in generating plant construction.

○ 90 billion Won was invested in DSM to reduce the peak load by 3,270㎿ in 2001.

Table 2.2 Demand Side Management

Classification	1997	1998	1999	2000	2001
Amount of DSM(MW)	2,206	2,374	2,624	2,859	3,268
Investment (billion Won)	31.1	46.0	65.3	118.0	90.0

※ 1. Investment costs exclude research and development costs.

2. The amount of demand side management is the grand total (excluding electricity rates control and direct load control)

B. Demand Side Management Target

○ DSM is of more importance with increased uncertainty in generating plant construction and raised volatility in electricity rates following the electricity industry restructuring.

○ DSM will be strengthened in order to stabilize the electricity demand and supply and to protect electricity consumers. In parallel, the measures to enhance the efficiency and effectiveness of DSM will be developed.

○ About 2,400 billion Won is planned to be invested in DSM by 2015 to reduce the peak load by 7,040MW

▪ The DSM target reflects the technologically maximum potential by DSM programs adoptable in Korea.

Table 2.3 Demand Side Management Target

(unit : ㎿)

Classification	2002	2005	2010	2015
The 1st BPE (’02)	609	2,577	5,265	7,039
The 5th LPDP (’00)	465	1,820	4,165	5,880

※ 1. The values are DSM in addition to the grand total by 2001(3,270㎿)
2. The amount of DSM in 2002 includes that of direct load control, 300㎿.

3. Electricity Demand Forecast

A. Electricity Sales

○ Average increase of 3.3% per annum, from 2,577TWh in 2001 to 3,920TWh in 2015

▪ Increase rate by class : residential 3.9%, commercial 5.0%, light industrial 2.7%, heavy industrial 1.4%

○ Configuration of electricity sales(2001→2015)

▪ Residential (15.2%→16.8%), commercial (32.1%→37.4%), light industrial (25.7%→24.3%), heavy industrial (27.0%→21.5%).

Table 2.4 Electricity Sales by Class

(Unit : GWh)

		2001	2005	2010	2015
Before DSM		259,098	314,023	360,968	398,166
After DSM	Residential	39,211	47,659	57,539	66,010
	Commercial	82,729	106,538	128,237	146,449
	Light Industrial	66,190	77,983	86,756	95,279
	Heavy Industrial	69,601	78,876	82,792	84,212
	Total	257,731	311,056	355,324	391,950

B. Peak Demand

○ Average increase of 3.4% per annum, from 43,130㎿ in 2001 to 67,750㎿ in 2015

○ Amount of DSM : additional reduction of 704㎿(3,270㎿ in 2001→10,310㎿ in 2015)

Table 2.5 Peak Demand Forecasts

(Unit : ㎿)

	2001	2005	2010	2015
Before DSM	46,393	57,704	69,157	78,502
After DSM	43,125	51,859	60,624	67,745

Ⅲ. Generating Capacity Expansion Outlook

1. Survey on Investors' Generating Capacity Addition and Retirement
2. Classification of Generating Capacity
3. Mid and Long Term Electricity Supply and Demand Outlook

1. Survey on Investors' Generating Capacity Addition and Retirement

A. Purpose of Survey

○ To collect information on generating capacity addition and retirement from generating companies and potential investors in the mid and long term period.

B. Generating Capacity Addition(Survey Result)

○ Generating companies and investors intend to build 97 generating units, 41,150 ㎿ prior to 2015. (Investment of about 41 trillion Won)

- Under construction : 42 units, 21,020 MW
- Planned : 55 units, 20,130 MW
- Generating companies subsidiary to KEPCO prefer coal power plants, while private companies prefer LNG power plants.

Table 3.1 Generating Capacity Addition by Company

(Unit : ㎿)

	KHNP	5 GenCos	KIECO,LG, Hyundai	DAELIM, DAEWOO	KEPCO, KOWACO	Total
Under Construction	10,800	8,550	1,569	-	103	21,022
Planned	2,800	10,256	2,250	4,500	320	20,126
Total	13,600	18,806	3,819	4,500	423	41,148

※ KHNP : Korea Hydro and Nuclear Power Co.

○ The survey indicated that the capacity addition of coal fired plants increased 3,400㎿ and that of LNG fired increased 4,300㎿, while oil fired and hydro decreased 4,000㎿ and 230㎿ respectively, compared with the generating capacity additions in the 5th Long Term Power Development Plan.

Table 3.2 Generating Capacity Addition by Fuel Type

(Unit : ㎿, # of units)

	Nuclear	Coal	LNG	Oil	Hydro	Total
The 5th LPDP	13,600 (12)	9,000 (15)	6,869 (20)	5,150 (12)	3,060 (23)	37,680 (82)
Survey result	13,600 (12)	12,400 (21)	11,169 (28)	1,150 (4)	2,832 (32)	41,150 (97)

C. Generating Capacity Retirement(Survey Result)

○ Generating companies intend to retire 6570㎿ between 2002 and 2015. (With plant life extension, 2,910㎿ is reduced compared with the 5th LPDP)

Table 3.3 Generating Capacity Retirements

(Unit : ㎿)

	2002～2010	2011～2015	2002～2015
The 5th LPDP	963	8,517	9,480
Survey result	376	6,197	6,573

D. Generating Capacity by Fuel Type(Survey Result)

○ The share of coal, LNG plants increased 3～4%p compared with that of the 5th LPDP.

Table 3.4 Generating Capacity by Fuel Type based on Survey Result

(Unit : MW, %)

		Nuclear	Coal	LNG	Oil	Hydro	Total
2010	The 5th LPDP	22,529 (30.2)	20,565 (27.6)	18,387 (24.6)	6,806 (9.1)	6,324 (8.5)	74,611 (100)
	Survey result	23,116 (28.4)	24,565 (30.2)	22,237 (27.3)	4,822 (5.9)	6,695 (8.2)	81,435 (100)
2015	The 5th LPDP	26,050 (33.0)	21,220 (26.8)	18,850 (23.8)	6,001 (7.6)	6,934 (8.8)	79,055 (100)
	Survey result	26,637 (31.2)	25,740 (30.1)	23,150 (27.1)	3,217 (3.8)	6,695 (7.5)	85,438 (100)

※ Oil includes orimulsion.

E. Estimated Capital Investment Based on Survey Result

○ It is estimated that about 40.5 trillion Won is required before 2015 to construct all of the generating units proposed in the survey.

▪ Capital investment in nuclear power plants : 18.4 trillion Won

Capital investment in hydro and thermal power plants : 22.1 trillion Won

Table 3.5 Estimated Capital Investment in the Capacity Addition

(Unit : Jan 1st 2001 billion Won)

Source	2002～2005	2006～2010	2011～2015	Total
Nuclear	3,962.0	10,569.1	3,909.3	18,440.4
Thermal	6,844.9	10,572.5	2,860.5	20,277.9
Pumped Storage	1,117.6	676.5	0	1,794.1
Total	11,924.5	21,818.1	6,769.8	40,512.4

※ 1. Small hydro, small island internal combustion and wind power facilities are excluded.

2. Classification of Generating Capacity

A. Classification Criteria

○ Following the electricity industry restructuring, the construction of generating plants has become more uncertain, because many factors such as financing, transmission interconnection and licensing, affect the construction of the plant. Thus, the generating capacity addition investors suggested in the survey are classified into 3 classes, A, B and C, in pursuant to the degree of certainty at this time.

○ Class B contains two subclasses, B1 and B2, and Class C contains three subclasses, C1, C2 and C3. 'The Most Probable Plan (MPP)' consists of generating units belonging to Class A, Class B and Class C1.

※ As projects progress, generating units currently belonging to Class C2 and C3 can be classified into higher classes in the future BPE.

Table 3.6 Classification Criteria

Present State	Class		Conditions
Under Construction	A		▸ Generating units under construction and determined construction plan before restructuring
Firmly Committed	B	B1	▸ Generating units that concluded transmission interconnection contract but have not started construction
		B2	▸ Generating units that acquired a generation business license but did not make transmission interconnection contract
Under Planning	C	C1	▸ Generating units that are expected to acquire a generation business license by 2003 and identified not having major problems in making transmission interconnection contract ▸ Generating units planned by public companies (Korea Electric Power Corporation and its subsidiaries, Korea Hydro and Nuclear Power and Korea Water Resource Corporation) are classified into C1 regardless of the acquisition of the generation business license (New Nuclear #1,2 and internal combustion units in small islands) ※ Among Class C2 units, those expected to make interconnection contract soon can be reclassified into Class C1.
		C2	▸ Generating units that are expected to acquire a generation business license by 2003 but need feasibility study on transmission interconnection
		C3	▸ Generating units that are expected to acquire generation business license after 2004

※ 1. Generation business license: It is assumed that the license is issued within 6 months after the establishment of the BPE

2. Capacity Retirements: All retirements are classified into Class A

B. Capacity Addition and Retirement (Most Probable Plan)

○ Among 97 generating units(41,150㎿) proposed in the survey, 71 units(32,740 ㎿) are categorized into the Most Probable Plan(Class A ~ Class C1)

- 21,020㎿ is the capacity under construction and 11,720M is that newly planned
- Compared with the 5th LPDP, the capacity of LNG increases 700㎿, that of coal decreases 100㎿, that of oil decreases 5,000㎿ and that of hydro and others decreases 540㎿.

Table 3.7 Generating Capacity Addition by Fuel Type based on MPP

(Unit : ㎿, units)

	Nuclear	Coal	LNG	Oil	Hydro	Total
The 5th LPDP	13,600 (12)	9,000 (15)	6,869 (20)	5,150 (12)	3,060 (23)	37,680 (82)
MPP (A-C1)	13,600 (12)	8,900 (16)	7,568.9 (20)	150 (2)	2,517.6 (21)	32,736.5 (71)

C. Generating capacity by fuel type(Most Probable Plan)

○ The share of coal, LNG and Nuclear energy increases 1~3%p compared with the 5th LPDP.

Table 3.8 Generating Capacity by Fuel Type based on MPP

(Unit: MW, %)

		Nuclear	Coal	LNG	Oil	Hydro	Total
2010	The 5th LPDP	22,529 (30.2)	20,565 (27.6)	18,387 (24.6)	6,806 (9.1)	6,324 (8.5)	74,611 (100)
	MPP (A-C1)	23,116 (29.2)	24,265 (30.7)	20,437 (25.9)	4,817 (6.1)	6,385 (8.1)	79,019 (100)
2015	The 5th LPDP	26,050 (33.0)	20,420 (25.8)	19,650 (24.8)	6,001 (7.6)	6,934 (8.8)	79,055 (100)
	MPP (A-C1)	26,637 (34.6)	22,440 (28.8)	19,550 (25.4)	2,212 (2.9)	6,385 (8.3)	77,023 (100)

※ Oil includes orimulsion

Figure 3.1 Generating Capacity by Fuel Type

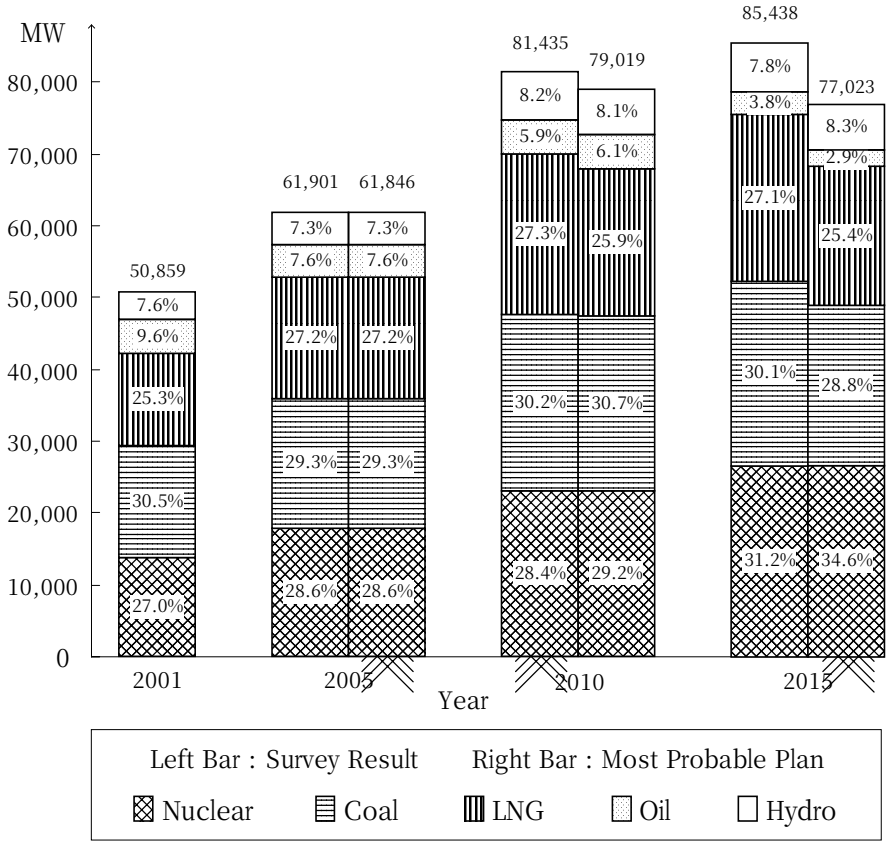


Table 3.9 Comparison of Generating Capacity by Fuel Type

(Unit : MW, %)

		Nuclear	Coal	LNG	Oil	Hydro	Total
2001		13,716 (27.0)	15,531 (30.5)	12,689 (25.3)	4,868 (9.6)	3,876 (7.6)	50,859 (100)
2005	Survey result	17,716 (28.6)	18,165 (29.3)	16,814 (27.2)	4,667 (7.6)	4,535 (7.3)	61,901 (100)
	MPP	17,716 (28.7)	18,165 (29.4)	16,814 (27.2)	4,667 (7.6)	4,485 (7.1)	61,846 (100)
2010	Survey result	23,116 (28.5)	24,565 (30.2)	22,237 (27.4)	4,822 (6.0)	6,695 (7.9)	81,435 (100)
	MPP	23,116 (29.3)	24,265 (30.8)	20,437 (25.9)	4,817 (6.1)	6,385 (7.9)	79,019 (100)
2015	Survey result	26,637 (31.3)	25,740 (30.2)	23,150 (27.2)	3,217 (3.8)	6,695 (7.5)	85,438 (100)
	MPP	26,637 (34.6)	22,240 (28.9)	19,550 (25.4)	2,212 (2.9)	6,385 (8.2)	77,023 (100)

D. Generation by Fuel Type(Estimates based on MPP)

Table 3.10 Generation by Fuel Type based on MPP

(Unit : GWh, %)

Year	Nuclear	Coal	Domestic Coal	LNG	Oil	Hydro	Orimul-sion	Total
2002 (Esti-mates)	122,764 (40.5)	110,945 (36.6)	7,001 (2.3)	29,664 (9.8)	26,666 (8.8)	3,982 (2.0)	-	303,042 (100)
2005	134,083 (38.8)	127,153 (36.8)	5,502 (1.6)	45,638 (13.2)	24,807 (7.2)	6,656 (2.0)	1,377 (0.4)	345,216 (100.0)
2008	138,870 (36.7)	156,448 (41.4)	6,098 (1.6)	43,073 (11.4)	23,995 (6.3)	8,300 (2.2)	1,302 (0.3)	378,086 (100.0)
2010	166,720 (42.1)	169,087 (42.7)	6,098 (1.5)	26,480 (6.7)	17,889 (4.5)	8,542 (2.1)	996 (0.3)	395,812 (100.0)

※ The values for 2002 are those estimated in the Annual Generation Operation Plan.

E. Fuel Consumption (Estimates based on MPP)

Table 3.11 Estimated Fuel Consumption based on MPP

Year	Coal (kTon)	Domestic Coal (kTon)	LNG (kTon)	Heavy Oil (MLiter)	Light Oil (MLiter)	Orimulsion (kTon)
2002(Estimate)	39,969	2,850	4,659	5,499	451	-
2005	46,985	2,607	5,900	5,509	509	446
2008	57,619	2,857	5,568	5,325	535	422
2010	62,095	2,857	3,508	3,959	534	324

※ The values for 2002 are those estimated in the Annual Generation Operation Plan.

F. Capital Investment (Estimates based on MPP)

○ About 34 trillion Won is estimated to be required for the implementation of the Most Probable Plan.

Table 3.12 Capital Investment Estimates based on MPP

(Unit : January 2001 Hundred million Won)

	2002～2005	2006～2010	2011～2015	Total
Nuclear	39,620	105,691	39,093	184,404
Thermal	67,301	67,837	0	135,138
Pumped Storage	11,176	6,765	0	17,941
Total	118,097	180,293	39,093	337,483

※ Small hydro, small island internal combustion and wind power facilities are excluded.

3. Mid and Long Term Electricity Supply and Demand Outlook

A. Supply & Demand Balance based on Survey Result(Class A ~ Class C3)

○ Installed reserve margin is maintained between 14% and 18% by 2006 and over 23% after 2007

Table 3.13 Electricity Supply and Demand Balance based on Survey Result

Year	Peak load (MW)	MPP (A~C1)				Survey result (A~C3)	
		Retirement (MW)	Addition (MW)	Generating capacity (MW)	Installed reserve margin (%)	Generating capacity (MW)	Installed reserve margin (%)
2002	45,742	310	3,252	52,649 (53,801)	15.1	52,649 (53,801)	15.1
2003	48,124	-	907	54,707 (54,708)	13.7	54,707 (54,708)	13.7
2004	50,193	66	3,833	57,675 (58,475)	14.9	57,731 (58,531)	15.0
2005	51,859	-	3,370	60,575 (61,846)	16.8	60,631 (61,901)	16.9
2006	53,743	-	3,423	63,296 (65,269)	17.8	63,351 (65,585)	17.9
2007	55,457	-	2,550	67,244 (67,819)	21.3	68,460 (69,035)	23.4
2008	57,214	-	3,800	70,119 (71,619)	22.6	71,335 (72,835)	24.7
2009	58,933	-	4,200	73,819 (75,819)	25.3	75,035 (77,335)	27.3
2010	60,624	-	3,200	75,819 (79,019)	25.1	78,235 (81,435)	29.0
2011	62,197	1,365	1,400	77,654 (79,054)	24.9	81,870 (84,070)	31.6
2012	63,732	428	-	78,627 (78,627)	23.4	84,142 (85,442)	32.0
2013	65,120	1204	-	77,423 (77,423)	18.9	84,238 (84,238)	29.4
2014	66,520	1700	1,400	77,123 (77,123)	15.9	83,938 (84,738)	26.2
2015	67,745	1500	1,400	77,023 (77,023)	13.7	85,438 (85,438)	26.1
Total	-	6,573	32,736	-	-	-	-

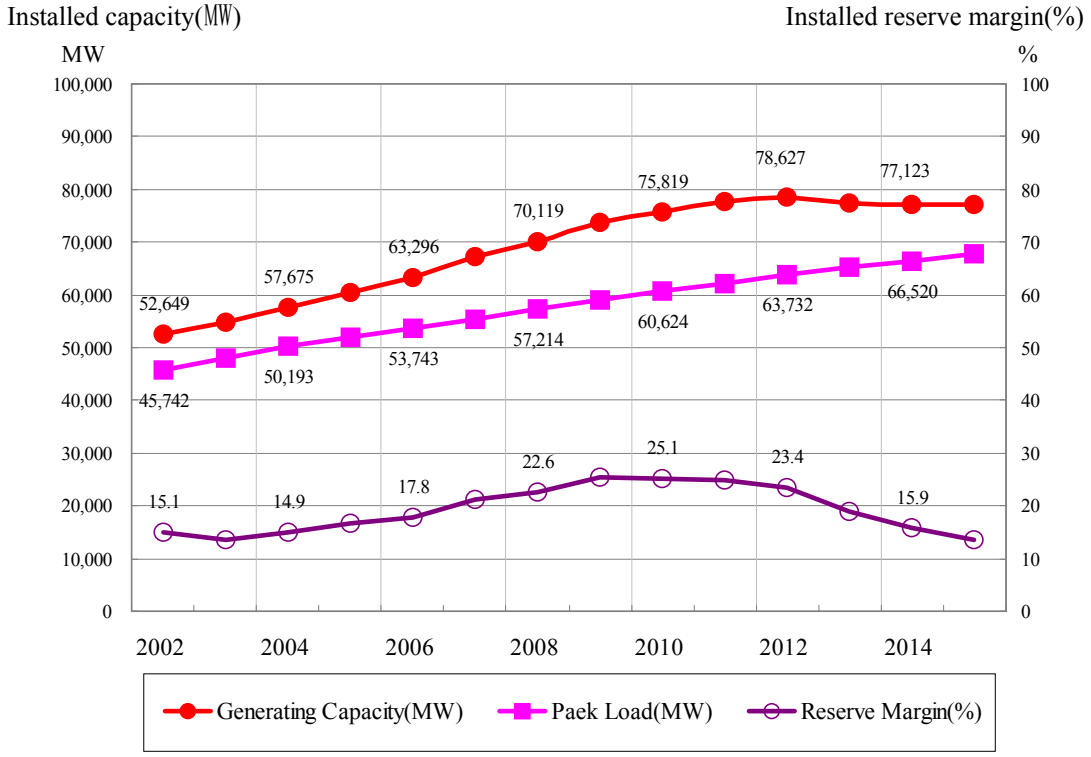
※ 1. The values in the parenthesis are those at the end of the year

2. Installed reserve margins are those at the summer peak

B. Supply and Demand Balance based on the Most Probable Plan (Class A ~ Class C1)

○ The installed reserve margin is maintained between 14% and 18% by 2006 and over 21% after 2007(Proper reserve margin : 15% ~ 17%)

Figure 3.2 Electricity Supply & Demand Outlook based on MPP



C. Electricity Supply and Demand based on MPP without Class C1

Table 3.14 Electricity Supply and Demand Based on MPP without Class C1

(Unit : MW, %)

	2002	2005	2007	2008	2010	2013	2015
Peak Load	45,742	51,859	55,457	57,214	60,624	65,120	67,745
Gen. Capacity	53,801	61,380	63,903	64,903	70,103	68,507	65,307
Reserve Margin	15.1	15.9	15.2	11.7	10.4	5.2	-3.6

※ 1. Gen. Capacity is the value of year-end.

Ⅳ. Transmission and Distribution Expansion Outlook

1. Regional Electricity Supply and Demand Outlook
2. Directions of Long Term Transmission and Distribution System Expansion
3. Network Expansion Outlook

1. Regional Electricity Supply & Demand Outlook

○ Transmission and distribution systems are required to be reinforced so as to cope with the electricity shortage expected in the Seoul metropolitan area and regional electricity supply and demand unbalance.

Table 4.1 Regional Electricity Supply and Demand Outlook

(Unit : MW)

Region	Classification	2001	2005	2010	2015
Kyungin	Peak load	18,380(42.6%)	22,082(42.6%)	25,777(42.5%)	28,765(42.5%)
	Installed capacity	12,412(25.0%)	14,162(23.4%)	18,012(23.8%)	18,000(23.4%)
	Supply capacity	10,781	12,135	14,428	15,852
	Surplus power	-7,599	-9,947	-11,349	-12,913
Youngdong	Peak load	2,648(6.1%)	3,174(6.1%)	3,698(6.1%)	4,119(6.1%)
	Installed capacity	5,419(10.9%)	7,346(12.1%)	8,617(11.3%)	7,714(10.0%)
	Supply capacity	4,701	6,275	6,851	6,775
	Surplus power	2,053	3,101	3,153	2,656
Joongboo	Peak load	5,033(11.7%)	6,140(11.8%)	7,269(12.0%)	8,224(12.1%)
	Installed capacity	9,257(18.7%)	11,241(18.5%)	15,241(20.1%)	15,923(20.7%)
	Supply capacity	8,064	9,594	12,185	14,023
	Surplus power	3,031	3,454	4,916	5,799
Honam	Peak load	3,381(7.8%)	4,076(7.9%)	4,783(7.9%)	5,365(7.9%)
	Installed capacity	10,123(20.4%)	13,113(21.7%)	14,736(19.5%)	14,385(18.7%)
	Supply capacity	8,064	9,594	12,185	14,023
	Surplus power	4,554	6,140	7,221	7,303
Youngnam	Peak load	13,683(31.7%)	16,387(31.6%)	19,097(31.5%)	21,272(31.4%)
	Installed capacity	13,411(27.0%)	15,911(26.3%)	18,924(25.0%)	21,001(27.2%)
	Supply capacity	11,644	13,639	15,156	18,427
	Surplus power	-2,039	-2,748	-3,941	-2,845
Total	Peak load	43,125	51,859	60,624	67,745
	Installed capacity	49,632	60,575	75,819	77,023
	Supply capacity	43,125	51,859	60,624	67,745

2. Directions of Long Term Transmission and Distribution(T&D) System Expansion

○ Long term transmission system expansion target

- 765㎸ line : It will directly interconnect the generation center to the Seoul metropolitan area.
- 345㎸ line : It will be constructed for the interregional network and as a bulk power source in the city area
- 154㎸ facility : It will be constructed for the intercity network and become the supply source of electricity distribution.
- 66㎸ facility : The construction of any new line will be restrained but flexibly following the load characteristics.
- Final T&D networking target after 2020 will be separately prepared.

○ Optimization of reliability and economics

- Minimization of the loss of load at the transmission/distribution facility outage
- Harmonization of the generation expansion plan and the transmission plan
- Pre-exploitation of lands needed to construct transmission/distribution line and substation
- Minimization of T&D loss and improvement of line investment efficiency

○ Improvement of transmission facility performance

- To secure the stability of a large transmission system (Timely expansion of transmission capacity, introduction of a flexible transmission system and transmission voltage upgrade to 765㎸)

- To develop a countermeasure to the fault current (strengthening of breaker standard, installation of series reactor, separate operation of partial substation bus and transmission line).
- To balance the supply and demand of reactive power (reinforcement of condenser for electric power, installation of shunt reactor, development of distributed generation, etc.)

3. Network Expansion Outlook

○ Total length of transmission line was 25,583C-㎞ in 2001 and is expected to be 35,439C-㎞ in 2005. The share of underground transmission line was 7% in 2001 and is expected to be 12% in 2015.

Table 4.2 Transmission Expansion Outlook

(Unit : C-㎞)

Voltage	2001 (Actual)	2005		2010		2015	
		Connect	Reinforce	Connect	Reinforce	Connect	Reinforce
765㎸	662	98	672	438	751	438	899
345㎸	7,345	542	7,909	1,054	8,804	1,118	8,975
154㎸	17,576	7	20,588	9	22,863	9	24,000
Total	25,583	647	29,169	1,501	32,418	1,565	33,874

※ 1. Connect : construction of transmission lines that interconnect power plants and substations.
2. Reinforce : expansion of transmission lines within the network.

○ The total number of substations was 472 in 2001 and is expected to be 769 in 2015.

Table 4.3 Substation Outlook

(Unit : # of stations)

Voltage	2001(Actual)	2005	2010		2015	
			Connect	Reinforce	Connect	Reinforce
765㎸	0	4	-	6	-	7
345㎸	45	55	2	62	2	69
154㎸	427	532	-	639	-	691
Total	472	591		707	2	767

※ 1. Connect : construction of transmission lines that interconnect power plants and substations.
2. Reinforce : expansion of transmission lines within the network.

○ The capacity of the substation facility was 142,806MVA in 2001 and is expected to be 266,259MVA in 2015. The share of extra-high voltage substation facility was 45% in 2001 and is expected to be 54%. in 2010.

Table 4.4 The Substation Capacity Outlook

Voltage		2001(Actual)	2005	2010	2015
Capacity (MVA)	765㎸	1,110	21,110	29,110	41,110
	345㎸	63,577	78,116	91,616	103,116
	154㎸	78,119	95,243	113,103	122,033
	Total	142,806	194,469	233,829	266,259

○ The investment in transmission/distribution expansion is expected to be about 15.5 trillion Won prior to 2015.

Table 4.5 Capital Investment in the Transmission/distribution Capacity Expansion

(Unit : billion Won)

Voltage	2002～2005	2006～2010	2011～2015	Total
765㎸	9,899	12,278	2,751	24,928
345㎸	16,501	15,641	10,600	42,742
154㎸	33,715	29,343	24,551	87,609
Total	60,115	57,262	37,902	155,279

Ⅴ. Policy Directions and Measures for Stable Electricity Supply and Demand

1. Active Management of Electricity Supply and Demand
2. Timely Construction of Generating Capacity
3. Timely Expansion of Transmission/Distribution System
4. Electricity Supply and Demand Balance by Market function

V . Policy Directions and Measures for Stable Electricity Supply and Demand

< Basic Directions >

○ Government plays a leading role in securing stable electricity supply and demand until the electricity market matures.

○ Government provides basic policy directions of electricity industry including the reliability criteria, appropriate fuel mix, nuclear power plant construction policy, transmission/distribution expansion policy, demand-side management target and so forth.

○ Government owned companies carry out construction projects in pursuant to the BPE, while private companies can implement construction for themselves but in harmony with the BPE.

○ In the event that the unstable electricity supply and demand are expected due to the lack of generating capacity, government will prepare and implement a contingency plan including generation capacity addition by public company.

○ Government will gradually reduce the regulatory intervention and establish the institutional foundation so that the electricity market can achieve the stable electricity supply and demand in the long run.

1. Active Management of Electricity Supply and Demand

A. Government's Active Management of Electricity Supply

○ Based on the reliability criteria of LOLP 0.5day/year, the installed reserve margin of 15～17% (supply reserve margin of 8～10%) is determined to be at a proper level with consideration of an enlarged electric system, technology advancement and improvements in operation.

○ For national energy security, the government tries to maintain an optimal energy resource mix determined through comprehensive analysis of system reliability, generation technology advancement, economics, environmental impacts and uncertainties.

Table 5.1 Energy Mix of the Generation Reference Plan

(Unit : %)

Year	Nuclear	Coal	LNG	Oil	Hydro
2005	28.9 (28.8)	29.7 (29.5)	26.7 (26.7)	7.6 (7.9)	7.1 (7.1)
2010	31.0 (30.2)	32.0 (27.6)	23.2 (24.6)	6.4 (9.1)	8.4 (8.5)
2015	37.4 (33.0)	30.9 (26.8)	20.9 (23.8)	2.8 (7.6)	8.0 (8.8)

※ The values in parenthesis are those of the 5th LPDP

○ In the case of public companies, the government manages and monitors how they implement the construction plan.

▪ Construction obligations could be stipulated in the managerial contract between the government and the public companies.

○ The government will strengthen the management to prevent the electricity businesses' intentional and unfair delay of generating plant constructions.

▪ The government could specify the construction preparation period by plant type, periodically review the progress of the construction project, prepare regulations on unfair delay of construction and oblige the electricity businesses to report the reason for delay.

○ The government will give priority in issuing the license to the projects correspondent with the government policy directions.

B. Flexible Management of the Short Term Demand Spike

○ When short term demand spike is expected, the government will adopt various short term measures for securing supply capacity such as timely completion of generating plant construction, utilization of the generation by plants in the pre-operation stage, minimization of maintenance outage during summer peak and enlargement of autogeneration.

○ In parallel, demand side management programs such as direct load control, adjustment of summer holidays and voluntary conservation of electricity use, will be flexibly employed.

C. Promotion of Mid and Long Term Demand Side Management

○ The government manages and monitors the implementation of demand side management to achieve the DSM target(reduction of summer peak load by 7,040㎿ prior to 2015)

- To achieve the target, the annual plan for the implementation of DSM is established and reflected in the 'Electricity Industry Infrastructure Development Plan'

○ The government will place the identical emphasis on demand side resources management as on supply side resources management in order to stabilize the electricity supply and electricity rates after the electricity industry restructuring.

- The 'Direct Load Control Project', which controls the consumers' load directly through contracts with consumers, is actively performed.(direct load control of 1,500㎿ by 2015).
- Introduction of the 'Demand Side Management Tender', in which demand side management businesses directly transact the demand side resources in the market, is considered.

○ The 'DSM Control and Assessment System' is considered to be introduced in order to achieve the transparency and efficiency of the demand side management

- Competition could be introduced in the demand side management system in which currently KEPCO is solely involved.

2. Timely Construction of Generating Capacity

A. Directions of Generating Capacity Construction

○ The government guides investors to construct generating capacity so that the reserve margin and energy mix suggested by the government can be satisfied.

○ The government guides investors to adopt advanced generating technologies for additional capacity addition in order to cope with the strengthened environmental regulation including that on green house gas emission.

○ While it is principle that new generating plants are constructed at the existing sites as much as possible, the government guides investors to construct generating plants in the vicinity of the load center with consideration of the difficulties expected in the exploitation of land for transmission facilities.

▪ In preparation for the interconnection between the South Korean and North Korean transmission system, the construction of a generating plant in the northern area of metropolitan Seoul is encouraged.

B. Implementation of the BPE

○ The government owned companies(KEPCO, KHNP and KEPCO's generation subsidiaries) are obliged to carry out the construction projects in pursuant to the BPE.

▪ When KEPCO's generation subsidiaries are privatized, they are required to make an agreement that forces them to construct the generating plants planned prior to the privatization.

▪ Construction obligation could be stipulated in the managerial contract between the government and the public companies.

○ In the case of nuclear power plants (NPPs), Korea Hydro and Nuclear Power formulates an implementation plan and constructs the plants in pursuant to the BPE.

▪ The government decides the direction of future NPP construction, collecting public opinions through the Electricity Policy Review Board etc. and considering the future electricity supply and demand balance.

○ Non nuclear generating plants are constructed according to the energy resource mix suggested by the government.

C. Governmental Support to Generating Capacity Addition

○ The government continues to compensate for the deficiency caused by cogeneration and the use of domestic anthracite coal. However, the government tries to develop measures to reduce the government's direct support to them.

○ The government subsidizes the construction and the operation of generating plants located at the islands having over 50 houses.

▪ In the case of the islands having less than 50 houses, where the regional government is currently in charge of electricity supply, KEPCO (distribution companies, once the distribution sector is separated from KEPCO) will take over the plants and supply the electricity.

○ It is under review that the government provides long term and low interest loans to the construction of plants that are identified to be required for the stable electricity supply in Jeju island.

○ The government actively supports technology development for the generating plant life extension, efficiency improvement and capacity upgrade.

D. Contingency Plan for the Lack of Generating Capacity

○ In the event that unstable electricity supply and demand are expected due to private investors' avoidance of the construction of generating plants, it could be considered as an alternative that the government requires the public companies or establishes a Power Development Corporation to construct emergency generating plants and privatize them at a later date.

○ It is also under consideration to use a portion of the revenue from the privatization of KEPCO's generation and distribution assets for the establishment of the Power Development Fund, which can be used to support the electricity businesses' construction of generation plants.

3. Timely Expansion of Transmission/Distribution System

A. Technical Criteria

○ Generating plants interconnection lines, main lines and load serving lines

- The size and time of transmission line construction are determined so that the lines provides sufficient transportation capacity, with consideration of final capacity at plant site.
- In determining the interconnecting method, various factors such as voltage level, economic feasibility, technology availability and construction environment are considered.

○ Construction of substation

- 765kV : It will be constructed when large transportation is needed. The size of the substation will be 4～5 Bank according to the final size of the system
- 345kV : It will be constructed when a large factory site or a new city is developed. The final size of the substation will be 4 Bank if permissible.
- 154kV : It will be constructed when the existing substation is insufficient or when a factory site or a region is developed. The final size of the substation will be 2～4 Bank according to load density.

○ Permissible accident criteria

- 765kV overhead line : one line failure
- overhead lines under 345kV : one line and on route failure
- underground line : one line failure
- main transformer : 1 Bank failure

B. Transmission/Distribution Expansion

○ KEPCO, the transmission asset owner, will prepare a detailed transmission expansion plan in pursuant to the BPE within 3 months after the completion of the BPE. The government will approve the transmission expansion plan and KEPCO will implement it.

○ KEPCO will construct additional submarine cable connecting the mainland and Jeju island for stable electricity supply in Jeju island where high demand growth is expected due to the development of the Jeju Free International City.

- In the case of a supply emergency, the phase modifying facility(about 80㎿) currently used for the submarine HVDC cable could be converted into a generating facility.
- The government encourages the construction of new generating plants by market function.

C. Revision of Transmission Interconnection Rule

○ The method for determining the allocation rate of the interconnection line construction costs between generator and transmission service provider is currently under review.

- The determination will be made based on a comprehensive analysis of interconnection costs and transmission tariff.
- The generators' entrance into the market, restriction of the competition, and stranded costs of transmission facilities are also being considered in the determination of the allocation rate.

4. Electricity Supply and Demand Balance by Market function

A. Restructuring on Schedule

○ The government provides a clear milestone of the ESI restructuring in order to reduce the uncertainties surrounding the future business environment and to encourage participation and investment in the electricity market.

○ It will be carried out to develop transparent market operation rule, to complement the electricity rates structure reflecting costs and to further the independency and expertise of the Korea Electricity Commission.

B. Deregulation

○ In order to encourage the autogeneration, the government will increase the limit of sales by autogeneration to the system up to 50% from the 30% currently permitted.

- The government will also allow the direct trade of the capacity that is used for autogeneration facilities' backup power.

○ The government will gradually reduce the regulations such as the restriction of domestic conglomerates' generation business which pose a barrier to the private investors' entrance into the market.

C. Development of Measures to Secure Adequate Reliability in the Competitive Market

○ Various measures are currently considered to secure adequate reliability in the competitive electricity market

- To adopt a capacity requirement system that obligates the load serving entities (distribution companies) to guarantee the reserve capacity. PJM is currently operating this type of system.
- To introduce vesting contracts between generating companies and electricity sales companies upon privatization of KEPCO's generation subsidiaries.
- To guide generation companies and electricity sales companies to make various financial contracts such as a contract for difference(CfD), forward contract and futures contract.

D. Timely Information Release and Reinforcement of Expertise

○ The government provides mid and long term electricity industry policy direction and information needed for investors' decision making through biennial establishment of the BPE.

○ The government fosters the Korea Power Exchange as the principal organization that supports the government's establishment of the BPE. To do this, the government assists the KPX in accumulating the necessary expertise through research and training.

Ⅵ. Future Policy Studies

1. Studies for the Establishment of the Basic Plan of Long Term Electricity Supply and Demand (BPE)
2. Studies for Stable Electricity Supply and Demand in the Competitive Electricity Market

1. Studies for the Establishment of the Basic Plan of the Long Term Electricity Supply and Demand (BPE)

○ Study on the improvement of the BPE

○ Development of methodology to combine generation expansion planning and transmission expansion planning

○ Study on the policy direction of the demand side management

○ Study on the information framework for the BPE

○ Development of policy measures to encourage the investment in the generating plant construction and to stabilize the electricity supply and demand

○ Study on the transmission system interconnection between South and North Korea and among north eastern countries

○ Study on the reduction of greenhouse gas emission in the electricity sector

2. Studies for Stable Electricity Supply and Demand in the Competitive Electricity Market

○ Development of measures to maintain proper energy mix and reserve margin in the competitive electricity market

○ Study on the permission of generation companies' electricity sales business.

○ Study on the utilization of the revenue from the privatization of KEPCO's generating subsidiaries

○ Study on the power plant construction by public companies in the competitive electricity market

○ Study on the policy measures to prevent market failure

○ Study on the establishment of a contingency plan

○ Study on the operation of existing facilities and the emergency construction of a new facility

○ Study on the complementation of the Electricity Business Act and relevant rules

APPENDICES

1. Electricity Demand Outlook

1.1 Reference Demand

Year		Electricity Sales		Peak load					
				Before DSM		DSM	After DSM		
		GWh	Increase rate (%)	MW	Load Factor (%)		MW	Increase rate (%)	Load Factor (%)
2000 (Actual)		239,535	11.8	41,007(43,866)	74.0	(2,859)	41,007	10.0	74.0
2001 (Actual)		257,731	7.6	43,125(46,355)	74.4	(3,230)	43,125	5.2	75.5
2002		271,009	5.2	46,051(49,281)	74.2	309(3,539)	45,742	6.1	74.6
2003		288,591	6.5	49,440(52,670)	73.7	1,316(4,546)	48,124	5.2	74.6
2004		299,983	3.9	52,120(55,350)	72.8	1,927(5,157)	50,193	4.3	74.1
2005		311,056	3.7	54,436(57,666)	72.4	2,577(5,807)	51,859	3.3	74.1
2006		321,184	3.3	56,838(60,068)	71.7	3,095(6,325)	53,743	3.6	73.9
2007		330,593	2.9	59,096(62,326)	71.0	3,639(6,869)	55,457	3.2	73.6
2008		339,452	2.7	61,381(64,611)	70.3	4,167(7,397)	57,214	3.2	73.3
2009		347,675	2.4	63,641(66,871)	69.5	4,708(7,938)	58,933	3.0	72.9
2010		355,324	2.2	65,889(69,119)	68.7	5,265(8,495)	60,624	2.9	72.4
2011		362,922	2.1	67,812(71,042)	68.1	5,615(8,845)	62,197	2.6	72.0
2012		370,248	2.0	69,698(72,928)	67.6	5,966(9,196)	63,732	2.5	71.6
2013		377,529	2.0	71,422(74,652)	67.2	6,302(9,532)	65,120	2.2	71.5
2014		384,825	1.9	73,169(76,399)	66.9	6,649(9,879)	66,520	2.1	71.4
2015		391,950	1.9	74,784(78,014)	66.6	7,039(10,269)	67,745	1.8	71.3
Ave. Increase rate (%)	'01-'05	5.4		5.8			4.8		
	'06-'10	2.7		3.9			3.2		
	'11-'15	2.0		2.6			2.2		
	'01-'10	4.0		4.9			4.0		
	'01-'15	3.3		4.1			3.4		

※ 1. Electricity sales are those reflecting the reduction by DSM
2. The values in parenthesis are those reflecting the grand total amount of DSM

1.2 High Demand

Year		Electricity Sales		Peak load				
				Before DSM		DSM	After DSM	
		GWh	Increase rate (%)	MW	Load Factor (%)		MW	Increase rate (%)
2000 (Actual)		239,535	11.8	41,007	74.0	(2,859)	41,007	74.0
2001 (Actual)		257,731	7.6	43,125	74.4	(3,230)	43,125	75.5
2002		285,931	9.1	48,818	73.8	879	47,939	74.6
2003		309,454	8.2	53,571	72.9	1,958	51,613	74.6
2004		329,377	6.4	57,925	71.9	2,800	55,125	74.1
2005		348,101	5.7	61,666	71.5	3,614	58,052	74.1
2006		365,790	5.1	65,594	70.7	4,364	61,230	73.9
2007		383,175	4.8	69,549	69.9	5,240	64,309	73.6
2008		400,164	4.4	73,613	69.0	6,126	67,487	73.3
2009		416,232	4.0	77,640	68.2	7,037	70,603	72.9
2010		431,566	3.7	81,677	67.2	7,987	73,691	72.4
2011		445,808	3.3	85,066	66.6	8,599	76,467	72.0
2012		460,053	3.2	88,523	66.0	9,260	79,263	71.6
2013		473,617	2.9	91,610	65.7	9,838	81,773	71.5
2014		486,956	2.8	94,677	65.4	10,421	84,256	71.4
2015		500,170	2.7	97,609	65.0	11,071	86,538	71.3
Ave. Increase rate (%)	'01-'05	7.8		8.5			7.8	
	'06-'10	4.4		5.8			4.4	
	'11-'15	3.0		3.6			3.0	
	'01-'10	6.1		7.1			6.1	
	'01-'15	5.0		6.0			5.0	

※ 1. Electricity sales are those reflecting the reduction by DSM
2. The high and low demand were forecasted with consideration of uncertainties in demand growth

1.3 Low Demand

Year		Electricity Sales		Peak load				
				Before DSM		DSM	After DSM	
		GWh	Increase rate (%)	MW	Load Factor (%)		MW	Increase rate (%)
2000 (Actual)		239,535	11.8	41,007	74.0	(2,859)	41,007	74.0
2001 (Actual)		257,731	7.6	43,125	74.4	(3,230)	43,125	75.5
2002		257,367	3.3	43,299	74.9	185	43,114	74.6
2003		263,265	2.2	44,604	74.3	800	43,804	74.6
2004		266,790	1.2	45,695	73.5	1,236	44,459	74.1
2005		270,114	1.1	46,440	73.3	1,686	44,753	74.1
2006		273,213	1.0	47,339	72.7	2,006	45,333	73.9
2007		275,983	0.9	48,166	72.1	2,366	45,800	73.6
2008		278,824	0.9	49,105	71.4	2,693	46,412	73.3
2009		281,139	0.7	49,990	70.8	3,008	46,981	72.9
2010		283,806	0.8	50,960	70.1	3,304	47,656	72.4
2011		285,357	0.5	51,511	69.6	3,400	48,111	72.0
2012		287,018	0.5	52,110	69.2	3,520	48,590	71.6
2013		288,724	0.5	52,596	68.9	3,626	48,971	71.5
2014		290,054	0.4	53,014	68.7	3,724	49,291	71.4
2015		290,674	0.1	53,227	68.5	3,882	49,345	71.3
Ave. Increase rate (%)	'01-'05	2.4		2.5			1.8	
	'06-'10	1.0		1.9			1.3	
	'11-'15	0.5		0.9			0.7	
	'01-'10	1.7		2.2			1.5	
	'01-'15	1.3		1.8			1.2	

※ 1. Electricity sales are those reflecting the reduction by DSM
2. The high and low demand were forecasted with consideration of uncertainties in demand growth

2. Demand Side Management Target

(Unit : MW)

Year	Demand Side Management							Efficiency Improvement				New	Gas Air Condi tionning	Total
	Summer Vacation	Voluntary Conser-vation	DLC	Accu-mulated Air Condi-tioning	Remote Air Condi-tioner Control	High Efficiency Vending Machine	**Sub Total**	High Efficiency Lighting	Inverter	High Efficiency Motor	**Sub Total**			
2002	80	52	300	34	4	3	473	38	28	2	68		68	609
2003	156	101	600	87	10	6	960	103	66	15	184	40	132	1,316
2004	221	143	800	141	20	12	1,337	172	130	32	334	60	196	1,927
2005	279	180	1,000	194	34	18	1,705	245	235	53	533	79	260	2,577
2006	338	219	1,044	257	51	25	1,934	323	336	79	738	99	324	3,095
2007	393	254	1,084	324	73	33	2,161	403	467	100	970	120	388	3,639
2008	450	291	1,123	399	96	41	2,400	433	623	117	1,173	142	452	4,167
2009	506	327	1,159	482	122	50	2,646	455	796	132	1,383	163	516	4,708
2010	561	363	1,195	572	149	58	2,898	474	979	146	1,599	188	580	5,265
2011	608	393	1,224	658	177	66	3,126	489	984	160	1,633	212	644	5,615
2012	654	423	1,252	749	208	74	3,360	500	990	174	1,664	234	708	5,966
2013	698	450	1,276	839	240	82	3,585	507	994	188	1,689	256	772	6,302
2014	741	478	1,301	937	274	90	3,821	511	999	203	1,713	279	836	6,649
2015	780	504	1,323	1,034	310	99	4,050	565	1,004	217	1,786	303	900	7,039

※ 1. The values in the table are net additions to those from the year 2001.
2. DSM in 2002 includes the direct load control of 300MW.
3. Annual amount of DSM depends on electricity supply and demand at the summer peak of the year.
4. To cope with demand spike, direct load control of 500MW is additionally attempted to be secured until 2005.

3. Generation Capacity Retirements

(Unit : MW)

Year	Nuclear	Steam Power				Internal Combustion		Capacity retirements
		Soft Coal	Anthracite	Heavy Oil	LNG	Heavy Oil	Light Oil (GT)	
2002			Youngwol #1,2 (100)	Busan #3,4 (210)				310 (4 stations)
2004			Kunsan (66)					66 (1 station)
Sub Total ('02～'10)		-	166.0 (3 stations)	210.0 (2 stations)	-			376 (6 stations)
2011		Honam #1,2(500)		Pyeongtaek #1,2 (700)			Jeju GT#1～3 (165)	1,365 (5 stations)
2012					Seoul #4,5 (387.5)	Bukjeju #1～8 (40)		427.5 (3 stations)
2013	Wolsung #1 (679)		Youngdong #1 (125)	Youngnam# 1,2 (400)				1,204 (4 stations)
2014			Seocheon #1,2 (400)	Pyeongtaek #3,4 (700) Ulsan #1～3(600)				1,700 (7 stations)
2015		Boryung #1,2 (1,000)			Incheon #1,2 (500)			1,500 (4 stations)
Sub Total ('11～'15)	679 (1 station)	1,500 (4 stations)	525 (3 stations)	2,400 (9 stations)	887.5 (4 stations)	40 (1 station)	165 (1 station)	6,196.5 (23 stations)
Total ('02～'15)	679 (1 station)	1,500 (4 stations)	691 (6 stations)	2,610 (11 stations)	887.5 (4 stations)	40 (1 station)	165 (1 stations)	6,572.5 (28 stations)

4. Reference Generating Capacity Expansion Plan

(Unit : MW, %)

Year	Installed reserve margin (at peak)	Nuclear	Coal	LNG	Heavy Oil	Light Oil	Anthracite	Hydro	Total
2000 (Actual)	16.8	13,716 (28.3)	12,740 (26.3)	12,689 (26.2)	4,570 (9.4)	296 (0.6)	1,291 (2.7)	3,149 (6.5)	48,451 (100)
2001 (Actual)	15.1	13,716 (27.0)	14,240 (28.0)	12,868 (25.3)	4,570 (9.0)	298 (0.6)	1,291 (2.5)	3,876 (7.6)	50,859 (100)
2002	14.1	15,716 (29.2)	14,740 (27.4)	13,618 (25.3)	4,360 (8.1)	300 (0.6)	1,191 (2.2)	3,876 (7.2)	53,801 (100)
2003	13.7	15,716 (28.7)	14,740 (26.9)	14,518 (26.5)	4,360 (8.0)	303 (0.6)	1,191 (2.2)	3,878 (7.1)	54,706 (100)
2004	14.8	16,716 (28.6)	16,340 (28.0)	15,714 (26.9)	4,360 (7.5)	308 (0.5)	1,125 (1.9)	3,886 (6.6)	58,448 (100)
2005	15.9	17,716 (28.9)	16,840 (27.5)	16,364 (26.7)	4,360 (7.1)	308 (0.5)	1,325 (2.2)	4,386 (7.1)	61,298 (100)
2006	16.8	17,716 (27.7)	17,340 (27.2)	17,287 (27.1)	4,360 (6.8)	308 (0.5)	1,325 (2.1)	5,486 (8.6)	63,821 (100)
2007	17.0	17,716 (27.3)	18,340 (28.2)	17,287 (26.6)	4,510 (6.9)	308 (0.5)	1,325 (2.0)	5,486 (8.5)	64,971 (100)
2008	17.8	18,716 (27.4)	20,740 (30.3)	17,287 (25.3)	4,510 (6.6)	308 (0.5)	1,325 (1.9)	5,486 (8.0)	68,371 (100)
2009	17.4	20,716 (29.0)	21,840 (30.6)	17,287 (24.2)	4,510 (6.3)	308 (0.4)	1,325 (1.8)	5,486 (7.7)	71,471 (100)
2010	17.9	23,116 (31.0)	21,840 (29.2)	17,287 (23.2)	4,510 (6.0)	308 (0.4)	1,325 (1.8)	6,286 (8.4)	74,671 (100)
2011	17.9	24,516 (32.8)	21,340 (28.6)	17,287 (23.1)	3,810 (5.1)	143 (0.2)	1,325 (1.8)	6,286 (8.4)	74,706 (100)
2012	16.5	24,516 (33.0)	21,340 (28.7)	16,900 (22.8)	3,810 (5.1)	103 (0.1)	1,325 (1.8)	6,286 (8.5)	74,279 (100)
2013	15.9	23,837 (31.6)	23,740 (31.5)	16,900 (22.4)	3,410 (4.5)	103 (0.1)	1,200 (1.6)	6,286 (8.3)	75,475 (100)
2014	16.3	26,637 (34.4)	24,540 (31.7)	16,900 (21.9)	2,110 (2.7)	103 (0.1)	800 (1.1)	6,286 (8.1)	77,375 (100)
2015	16.1	29,437 (37.4)	23,540 (29.9)	16,400 (20.9)	2,110 (2.7)	103 (0.1)	800 (1.0)	6,286 (8.0)	78,675 (100)

※ The reference generating capacity expansion plan is established through comprehensive analysis of system reliability, generation technology advancement, economics, environmental impacts and uncertainties.

5. Survey on Generating Capacity Addition & retirement

5.1 Generating Capacity Additions & Retirements

Year		Plant Name				Installed Capacity (MW)	Peak load (MW)	Installed reserve margin (%)
		Class	Plant Name	Company	MW			
2001	M	Existing Facility				49,632 (50,859)	43,125	15.1
2002	1	A	Ret-Busan Oil #3,4	KOSPO	-210.0	52,649 (53,801)	45,742	15.1
	1	A	Ret-Youngwol A.. #1,2	KOSPO	-100.0			
	1	A	Hanwha CC #4	KIECO	150.0			
	5	A	Younggwang Nuclear #5	KHNP	1,000.0			
	5	A	Taean Coal #6	WP	500.0			
	5	A	Boryeoung CC #2(S/T)	KOMIPO	150.0			
	6	A	Boryeoung CC #4(S/T)	KOMIPO	150.0			
	7	A	Boryeoung CC #1(S/T)	KOMIPO	150.0			
	7	A	Wido IC	KEPCO	0.5			
	8	A	Keomundo IC	KEPCO	0.2			
	8	A	Boryeoung CC #3(S/T)	KOMIPO	150.0			
	9	A	Uleungdo IC	KEPCO	1.5			
	12	A	Younggwang Nuclear#6	KHNP	1,000.0			
2003	6	C1	Andong Hydro(Multi purpose)	KOWACO	1.5	54,707 (54,708)	48,124	13.7
	6	C1	Wido IC	KEPCO	2.0			
	7	C1	Baekryeongdo IC	KEPCO	3.0			
	7	A	Busan CC #1	KOSPO	450.0			
	7	A	Busan CC #2	KOSPO	450.0			
	12	C1	Tamjin(Multi purpose)	KOWACO	0.6			
	12	C1	Daegok(Multi purpose)	KOWACO	0.3			
2004	1	A	Ret-Kunsan Anthracite	WP	-66.0	57,731 (58,531)	50,193	15.0
	4	C1	Renewable (Jeju)#1	KOSPO	6.0			
	4	C1	Yongdam Small Hydro	KOWACO	1.6			
	4	C2	Youngdeok Wind Power	UNISON	50.0			
	6	A	Yulchon CC G/T	MIRANT	295.7			
	6	A	Busan CC #3	KOSPO	450.0			
	6	A	Busan CC #4	KOSPO	450.0			
	6	A	Uljin Nuclear #5	KHNP	1,000.0			
	6	C1	Chujado IC	KEPCO	1.4			
	6	C2	8 Islands (including Hongdo)	KEPCO	5.3			
	6	A	Youngheung Coal #1	KOSEP	800.0			
	7	B2	Gangwon Windpower #2	GAWIP	28.5			
	12	A	Youngheung Coal #2	KOSEP	800.0			

※ 1. The values in the parenthesis are those of the year end.
2. For the classification of generating capacity additions and retirements refer to Table 3.6

Year		Plant Name				Installed Capacity (MW)	Peak load (MW)	Installed reserve margin (%)
		Class	Plant Name	Company	MW			
2005	3	A	Kwangyang CC #1	SK	473.5	60,631 (61,901)	51,859	16.9
	5	C1	Bugok CC #2	LG Energy	450.0			
	6	A	Yulchon CC S/T	MIRANT	176.2			
	6	A	Uljin Nuclear#6	KHNP	1,000.0			
	6	C2	Biando IC	KEPCO	0.1			
	9	A	Youngwol Anthracite#3	KOSPO	200.0			
	9	A	Yangyang P.S. #1	KOMIPO	250.0			
	11	B2	Gangwon Wind Power	GAWIP	70.5			
	12	A	Dangjin Coal #5	KEWP	500.0			
	12	A	Yangyang P.S. #2	KOMIPO	250.0			
2006	3	A	Yangyang P.S. #3	KOMIPO	250.0	63,351 (65,585)	53,743	17.9
	6	A	Dangjin Coal #6	KEWP	500.0			
	6	A	Yangyang P.S. #4	KOMIPO	250.0			
	6	A	Incheon CC #1	KOMIPO	450.0			
	9	A	Chung song P.S. #1	WP	300.0			
	11	C1	Anjeong CC #1	DAEWOO	450.0			
	11	C1	Anjeong CC #2	DAEWOO	450.0			
	12	A	Chung song P.S. #2	WP	300.0			
	12	A	Kwangyamg CC #2	SK	473.5			
	12	C2	Sihwaho Tidal Power	KOWACO	260.0			
2007	5	C2	Bugok CC #3	LG Energy	450.0	68,460 (69,035)	55,457	23.4
	5	C2	Bugok CC #4	LG Energy	450.0			
	6	C1	Songdo CC #1	DAELIM	450.0			
	6	C1	Songdo CC #2	DAELIM	450.0			
	6	C1	Dangjin Coal #7	KEWP	500.0			
	6	C1	Jeju Petroelum #1	KOSPO	75.0			
	6	C1	Taean Coal #7	WP	500.0			
	12	C1	Jeju Petroelum #2	KOSPO	75.0			
	12	C1	Dangjin Coal #8	KEWP	500.0			
2008	3	C1	Taean Coal #8	WP	500.0	71,335 (72,835)	57,214	24.7
	6	C1	Hadong Coal #7	KOSPO	500.0			
	6	C1	Boryeong Coal #7	KOMIPO	500.0			
	6	C1	Youngheung Coal #3	KOSEP	800.0			
	9	A	Sinkori Nuclear #1	KHNP	1,000.0			
	12	C1	Boryung Coal #8	KOMIPO	500.0			
2009	3	C1	Hadong Coal #8	KOSPO	500.0	75,035 (77,335)	58,933	27.3
	3	C1	Youngheung Coal #4	KOSEP	800.0			
	6	C1	Songdo CC #3	DAELIM	450.0			
	6	C1	Songdo CC #4	DAELIM	450.0			
	9	A	Sinkori Nuclear #2	KHNP	1,000.0			
	9	A	Sinwolseong Nuclear #1	KHNP	1,000.0			
	9	C2	Cheongjeong Coal (CCT) #1	WP	300.0			

Year		Plant Name				Installed Capacity (MW)	Peak load (MW)	Installed reserve margin (%)
		Class	Plant Name	Company	MW			
2010	2	C3	Anjeong CC #3	DAEWOO	450.0	78,235 (81,435)	60,624	29.0
	2	C3	Anjeong CC #4	DAEWOO	450.0			
	9	A	Sinkori Nuclear #3	KHNP	1,400.0			
	9	A	Sinwolseong Nuclear#2	KHNP	1,000.0			
	9	A	Yecheon PS #1	KOSEP	400.0			
	12	A	Yecheon PS #2	KOSEP	400.0			
2011	1	A	Ret.-Jeju(G/T) #1,2	KEPCO	-110.0	81,870 (84,070)	62,197	31.6
	1	A	Ret.-Jeju(G/T) #3	KOMIPO	-55.0			
	1	A	Ret.-Honam Coal #1,2	KEWP	-500.0			
	1	A	Ret.-Pyeongtaek Oil#1,2	WP	-700.0			
	6	C3	Songdo CC #5	DAELIM	450.0			
	6	C3	Songdo CC #6	DAELIM	450.0			
	6	C3	Bugok C C#5	LG Energy	450.0			
	6	C3	Bugok CC #6	LG Energy	450.0			
	9	A	Sinkori Nuclear #4	KHNP	1,400.0			
	9	C2	New Coal #1	KOSEP	800.0			
2012	1	A	Ret.-Seoul LNG #4,5	KOMIPO	-387.5	84,142 (85,442)	63,732	32.0
	1	A	Ret.-Jeju IC #1-8	KOMIPO	-40.0			
	3	C2	Gunjang Orim. #1	KOMIPO	500.0			
	9	C2	Gunjang Orim. #2	KOMIPO	500.0			
	9	C2	New Coal #2	KOSEP	800.0			
2013	1	A	Ret.-Youngdong Ant.#1	KOSEP	-125.0	84,238 (84,238)	65,120	29.4
	1	A	Ret.-Youngnam Oil#1,2	KOSPO	-400.0			
	4	A	Ret-Wolseong Nuclear#1	KHNP	-679.0			
2014	1	A	Ret.-Ulsan Oil #1-3	KEWP	-600.0	83,938 (84,738)	66,520	26.2
	1	A	Ret.-Pyeongtaek Oil#3,4	WP	-700.0			
	1	A	Ret.-Seocheon Ant. #1,2	KOMIPO	-400.0			
	6	C1	New Nuclear #1	KHNP	1,400.0			
	9	C3	New Coal #3	KOSEP	800.0			
2015	1	A	Ret.-Incheon LNG #1,2	KOMIPO	-500.0	85,438 (85,438)	67,745	26.1
	1	A	Ret.-Boryong Coal #1,2	KOMIPO	-1000.0			
	6	C1	New Nuclear #2	KHNP	1,400.0			
	6	C3	New Coal #4	KOSEP	800.0			

5.2 Generating Capacity by Fuel Type (Survey Result)

(Unit : ㎿, %)

Year	Nuclear	Coal	LNG	Heavy Oil	Light Oil	Anthracite	Hydro	Total
2000 (Actual)	13,716 (28.3)	12,740 (26.3)	12,689 (26.2)	4,570 (9.4)	296 (0.6)	1,291 (2.7)	3,149 (6.5)	48,451 (100)
2001 (Actual)	13,716 (27.0)	14,240 (28.0)	12,868 (25.3)	4,570 (9.0)	298 (0.6)	1,291 (2.5)	3,876 (7.6)	50,859 (100)
2002	15,716 (29.2)	14,740 (27.4)	13,618 (25.3)	4,360 (8.1)	300 (0.6)	1,191 (2.2)	3,876 (7.2)	53,801 (100)
2003	15,716 (28.7)	14,740 (26.9)	14,518 (26.5)	4,360 (8.0)	305 (0.6)	1,191 (2.2)	3,878 (7.1)	54,708 (100)
2004	16,716 (28.6)	16,340 (27.9)	15,714 (26.8)	4,360 (7.5)	312 (0.5)	1,125 (1.9)	3,964 (6.8)	58,531 (100)
2005	17,716 (28.6)	16,840 (27.2)	16,814 (27.2)	4,360 (7.1)	312 (0.5)	1,325 (2.1)	4,535 (7.3)	61,901 (100)
2006	17,716 (27.0)	17,340 (26.4)	18,637 (28.4)	4,360 (6.7)	312 (0.5)	1,325 (2.0)	5,895 (9.0)	65,585 (100)
2007	17,716 (25.7)	18,840 (27.3)	20,437 (29.6)	4,510 (6.5)	312 (0.5)	1,325 (1.9)	5,895 (8.5)	69,035 (100)
2008	18,716 (25.7)	21,640 (29.7)	20,437 (28.1)	4,510 (6.2)	312 (0.4)	1,325 (1.8)	5,895 (8.1)	72,835 (100)
2009	20,716 (26.8)	23,240 (30.1)	21,337 (27.6)	4,510 (5.8)	312 (0.4)	1,325 (1.7)	5,895 (7.6)	77,335 (100)
2010	23,116 (28.4)	23,240 (28.6)	22,237 (27.3)	4,510 (5.5)	312 (0.4)	1,325 (1.6)	6,695 (8.2)	81,435 (100)
2011	24,516 (29.1)	23,540 (28.0)	24,037 (28.6)	3,810 (4.5)	147 (0.2)	1,325 (1.6)	6,695 (8.0)	84,070 (100)
2012	24,516 (28.7)	24,340 (28.5)	23,650 (27.7)	4,810 (5.6)	107 (0.1)	1,325 (1.6)	6,695 (7.8)	85,442 (100)
2013	23,837 (28.3)	24,340 (28.9)	23,650 (28.1)	4,410 (5.2)	107 (0.1)	1,200 (1.4)	6,695 (8.0)	84,238 (100)
2014	25,237 (29.8)	25,140 (29.7)	23,650 (27.9)	3,110 (3.7)	107 (0.1)	800 (0.9)	6,695 (7.9)	84,738 (100)
2015	26,637 (31.2)	24,940 (29.2)	23,150 (27.1)	3,110 (3.7)	107 (0.1)	800 (0.9)	6,695 (7.8)	85,438 (100)

5.3 Estimated Electricity Generation by Fuel Type (Survey Result)

(Unit : GWh, %)

Year	Nuclear	Coal	Anthracite	LNG	Heavy Oil	Light Oil	Hydro	PS	Orimulsion	Total
2001 (Actual	112,133 (39.3)	105,098 (36.9)	5,235 (1.8)	30,451 (10.7)	27,770 (9.7)	386 (0.1)	1,821 (0.7)	2,330 (0.8)	-	285,224 (100)
2002	122,764 (40.5)	110,945 (36.6)	7,001 (2.3)	29,684 (9.8)	26,338 (8.7)	328 (0.1)	3,408 (1.1)	2,574 (0.9)	-	303,042 (100)
2003	122,913 (38.6)	114,032 (35.8)	5,956 (1.9)	43,977 (13.8)	24,293 (7.6)	1,348 (0.4)	4,054 (1.3)	187 (0.1)	1,360 (0.4)	318,120 (100.0)
2004	125,674 (38.0)	116,777 (35.3)	5,157 (1.6)	50,774 (15.4)	25,246 (7.6)	1,387 (0.4)	4,054 (1.2)	140 (0.0)	1,394 (0.4)	330,603 (100.0)
2005	134,083 (39.1)	127,031 (37.0)	5,502 (1.6)	45,979 (13.4)	23,270 (6.8)	1,418 (0.4)	4,054 (1.2)	204 (0.1)	1,345 (0.4)	342,886 (100.0)
2006	137,362 (38.8)	132,013 (37.3)	6,112 (1.7)	47,873 (13.5)	23,602 (6.7)	1,435 (0.4)	4,106 (1.2)	202 (0.1)	1,337 (0.4)	354,042 (100.0)
2007	136,667 (37.5)	138,163 (37.9)	6,098 (1.7)	53,401 (14.7)	22,922 (6.3)	1,465 (0.4)	4,106 (1.1)	149 (0.0)	1,361 (0.4)	364,332 (100.0)
2008	138,870 (37.1)	155,741 (41.6)	6,098 (1.6)	45,465 (12.2)	20,915 (5.6)	1,507 (0.4)	4,106 (1.1)	183 (0.0)	1,252 (0.3)	374,137 (100.0)
2009	149,593 (39.0)	171,362 (44.7)	6,098 (1.6)	32,603 (8.5)	16,760 (4.4)	1,510 (0.4)	4,106 (1.1)	352 (0.1)	1,036 (0.3)	383,420 (100.0)
2010	166,696 (42.5)	169,622 (43.2)	6,098 (1.6)	27,343 (7.0)	15,391 (3.9)	1,482 (0.4)	4,106 (1.0)	855 (0.2)	925 (0.2)	392,518 (100.0)
2011	183,259 (45.6)	165,214 (41.1)	6,097 (1.5)	26,235 (6.5)	13,303 (3.3)	1,191 (0.3)	4,106 (1.0)	1,593 (0.4)	874 (0.2)	401,872 (100.0)
2012	189,977 (46.3)	169,720 (41.3)	6,097 (1.5)	21,758 (5.3)	12,330 (3.0)	1,190 (0.3)	4,106 (1.0)	2,081 (0.5)	3,335 (0.8)	410,594 (100.0)
2013	183,307 (43.9)	177,353 (42.5)	5,705 (1.4)	27,196 (6.5)	12,193 (2.9)	1,213 (0.3)	4,106 (1.0)	1,219 (0.3)	5,169 (1.2)	417,461 (100.0)
2014	189,442 (44.5)	179,010 (42.1)	4,435 (1.0)	33,346 (7.8)	7,670 (1.8)	1,218 (0.3)	4,106 (1.0)	1,061 (0.2)	5,001 (1.2)	425,289 (100.0)
2015	201,172 (46.4)	177,979 (41.1)	4,433 (1.0)	30,997 (7.2)	7,483 (1.7)	1,207 (0.3)	4,106 (0.9)	1,339 (0.3)	4,792 (1.1)	433,508 (100.0)

※ 1. The values of year 2002 are those of the Generation Operation Plan

5.4 Estimated Fuel Consumption Based on Survey Result

Year	Coal (kTon)	Anthracite (kTon)	LNG (kTon)	Heavy Oil (Ml)	Light Oil (Ml)	Orimulsion (kTon)	CO_2 Emission (kTon)	Generation (GWh)	CO_2 Emission (kgC/kWh)
2001 (Actual)	37,919	2,875	4,791	5,497	107	-	36,589	285,224	0.1286
2002	39,969	2,850	4,659	5,499	451	-	38,686	303,042	0.1277
2003	42,192	2,852	5,747	5,734	461	434	39,608	318,120	0.1245
2004	43,200	2,456	6,607	5,942	488	446	40,989	330,603	0.1240
2005	46,936	2,607	5,954	5,492	504	431	42,605	342,886	0.1243
2006	48,754	2,857	6,179	5,579	507	429	44,195	354,042	0.1248
2007	50,995	2,857	6,850	5,422	514	436	46,103	364,332	0.1265
2008	57,345	2,857	5,858	4,984	525	402	49,080	374,137	0.1312
2009	62,948	2,857	4,268	4,056	527	333	50,618	383,420	0.1320
2010	62,281	2,857	3,614	3,750	521	297	49,347	392,518	0.1257
2011	60,523	2,857	3,481	3,286	439	281	47,605	401,872	0.1185
2012	62,155	2,857	2,919	2,965	440	992	48,337	410,594	0.1177
2013	64,974	2,659	3,598	2,924	446	1,500	50,911	417,461	0.1220
2014	65,585	2,016	4,360	1,853	447	1,451	50,662	425,289	0.1191
2015	65,092	2,015	4,069	1,812	445	1,391	50,025	435,508	0.1154

※ 1. The values of year 2002 are those of the Generation Operation Plan

6. The Most Probable Plan

6.1 Annual Generating Capacity Addition & Retirement

Year		Plant Name				Installed Capacity (MW)	Peak load (MW)	Installed reserve margin (%)
		Class	Plant Name	Company	MW			
2001	M	Existing Facility				49,632 (50,859)	43,125	15.1
2002	1	A	Ret-Busan Oil #3,4	KOSPO	-210.0	52,649 (53,801)	45,742	15.1
	1	A	Ret-Youngwol A.. #1,2	KOSPO	-100.0			
	1	A	Hanwha CC #4	KIECO	150.0			
	5	A	Younggwang Nuclear #5	KHNP	1,000.0			
	5	A	Taean Coal #6	WP	500.0			
	5	A	Boryeong CC #2(S/T)	KOMIPO	150.0			
	6	A	Boryeong CC #4(S/T)	KOMIPO	150.0			
	7	A	Boryeong CC #1(S/T)	KOMIPO	150.0			
	7	A	Wido IC	KEPCO	0.5			
	8	A	Keomundo IC	KEPCO	0.2			
	8	A	Boryeong CC #3(S/T)	KOMIPO	150.0			
	9	A	Uleungdo IC	KEPCO	1.5			
	12	A	Younggwang Nuclear#6	KHNP	1,000.0			
2003	6	C1	Andong Hydro(Multi purpose)	KOWACO	1.5	54,707 (54,708)	48,124	13.7
	6	C1	Wido IC	KEPCO	2.0			
	7	C1	Baekryeongdo IC	KEPCO	3.0			
	7	A	Busan CC #1	KOSPO	450.0			
	7	A	Busan CC #2	KOSPO	450.0			
	12	C1	Tamjin(Multi purpose)	KOWACO	0.6			
	12	C1	Daegok(Multi purpose)	KOWACO	0.3			
2004	1	A	Ret-Kunsan Anthracite	WP	-66.0	57,675 (58,475)	50,193	14.9
	4	C1	Renewable (Jeju)#1	KOSPO	6.0			
	4	C1	Yongdam Small Hydro	KOWACO	1.6			
	6	A	Yulchon CC G/T	MIRANT	295.7			
	6	A	Busan CC #3	KOSPO	450.0			
	6	A	Busan CC #4	KOSPO	450.0			
	6	A	Uljin Nuclear #5	KHNP	1,000.0			
	6	C1	Chujado IC	KEPCO	1.4			
	6	A	Youngheung Coal #1	KOSEP	800.0			
	7	B2	Gangwon Windpower #2	GAWIP	28.5			
	12	A	Youngheung Coal #2	KOSEP	800.0			

※ 1. The values in the parenthesis are those of the year end.
2. For the classification of generating capacity additions and retirements refer to Table 3.6

Year		Plant Name				Installed Capacity (MW)	Peak load (MW)	Installed reserve margin (%)
		Class	Plant Name	Company	MW			
2005	3	A	Kwangyang CC #1	SK	473.5	60,575 (61846)	51,859	16.8
	5	C1	Bugok CC #2	LG Energy	450.0			
	6	A	Yulchon CC S/T	MIRANT	176.2			
	6	A	Uljin Nuclear#6	KHNP	1,000.0			
	9	A	Youngwol Anthracite #3	KOSPO	200.0			
	9	A	Yangyang P.S. #1	KOMIPO	250.0			
	11	B2	Gangwon Wind Power	GAWIP	70.5			
	12	A	Dangjin Coal #5	KEWP	500.0			
	12	A	Yangyang P.S. #2	KOMIPO	250.0			
2006	3	A	Yangyang P.S. #3	KOMIPO	250.0	63,296 (65,269)	53,743	17.8
	6	A	Dangjin Coal #6	KEWP	500.0			
	6	A	Yangyang P.S. #4	KOMIPO	250.0			
	6	A	Incheon CC #1	KOMIPO	450.0			
	9	A	Chung song P.S. #1	WP	300.0			
	11	C1	Anjeong CC #1	DAEWOO	450.0			
	11	C1	Anjeong CC #2	DAEWOO	450.0			
	12	A	Chung song P.S. #2	WP	300.0			
	12	A	Kwangyamg CC #2	SK	473.5			
2007	6	C1	Songdo CC #1	DAELIM	450.0	67,244 (67,819)	55,457	21.3
	6	C1	Songdo CC #2	DAELIM	450.0			
	6	C1	Dangjin Coal #7	KEWP	500.0			
	6	C1	Jeju Petroelum #1	KOSPO	75.0			
	6	C1	Taean Coal #7	WP	500.0			
	12	C1	Jeju Petroelum #2	KOSPO	75.0			
	12	C1	Dangjin Coal #8	KEWP	500.0			
2008	3	C1	Taean Coal #8	WP	500.0	70,119 (71,69)	57,214	22.6
	6	C1	Hadong Coal #7	KOSPO	500.0			
	6	C1	Boryeong Coal #7	KOMIPO	500.0			
	6	C1	Youngheung Coal #3	KOSEP	800.0			
	9	A	Sinkori Nuclear #1	KHNP	1,000.0			
	12	C1	Boryeong Coal #8	KOMIPO	500.0			
2009	3	C1	Hadong Coal #8	KOSPO	500.0	73,819 (75,819)	58,933	25.3
	3	C1	Youngheung Coal #4	KOSEP	800.0			
	6	C1	Songdo CC #3	DAELIM	450.0			
	6	C1	Songdo CC #4	DAELIM	450.0			
	9	A	Sinkori Nuclear #2	KHNP	1,000.0			
	9	A	Sinwolseong Nuclear #1	KHNP	1,000.0			

Year		Plant Name				Installed Capacity (MW)	Peak load (MW)	Installed reserve margin (%)
		Class	Plant Name	Company	MW			
2010	9	A	Sikori Nuclear #3	KHNP	1,400.0	75,819 (79,019)	60,624	25.1
	9	A	Sinwolseong Nuclear#2	KHNP	1,000.0			
	9	A	Yecheon PS #1	KOSEP	400.0			
	12	A	Yecheon PS #2	KOSEP	400.0			
2011	1	A	Ret.-Jeju(G/T) #1,2	KEPCO	-110.0	77,654 (79,054)	62,197	24.9
	1	A	Ret.-Jeju(G/T) #3	KOMIPO	-55.0			
	1	A	Ret.-Honam Coal #1,2	KEWP	-500.0			
	1	A	Ret.-Pyeongtaek Oil#1,2	WP	-700.0			
	9	A	Sinkori Nuclear #4	KHNP	1,400.			
2012	1	A	Ret.-Seoul LNG #4,5	KOMIPO	-387.5	78,627 (78,627)	63,732	23.4
	1	A	Ret.-Jeju IC #1-8	KOMIPO	-40.0			
2013	1	A	Ret.-Youngdong Ant.#1	KOSEP	-125.0	77,423 (77,423)	65,120	18.9
	1	A	Ret.-Youngnam Oil#1,2	KOSPO	-400.0			
	4	A	Ret-Wolseong Nuclear#1	KHNP	-679.0			
2014	1	A	Ret.-Ulsan Oil #1-3	KEWP	-600.0	77,123 (77,123)	66,520	15.9
	1	A	Ret.-Pyeongtaek Oil#3,4	WP	-700.0			
	1	A	Ret.-Seocheon Ant. #1,2	KOMIPO	-400.0			
	6	C1	New Nuclear #1	KHNP	1,400.			
2015	1	A	Ret.-Incheon LNG #1,2	KOMIPO	-500.0	77,023 (77,023)	67,745	13.7
	1	A	Ret.-Boryeong Coal #1,2	KOMIPO	-1000.0			
	6	C	New Nuclear #2	KHNP	1,400.0			

6.2 Generating Capacity by Fuel Type(MPP)

(Unit : MW, %)

Year	Nuclear	Coal	LNG	Heavy Oil	Light Oil	Anthracite	Hydro	Total
2000 (Actual)	13,716 (28.3)	12,740 (26.3)	12,689 (26.2)	4,570 (9.4)	296 (0.6)	1,291 (2.7)	3,149 (6.5)	48,451 (100)
2001 (Actual)	13,716 (27.0)	14,240 (28.0)	12,868 (25.3)	4,570 (9.0)	298 (0.6)	1,291 (2.5)	3,876 (7.6)	50,859 (100)
2002	15,716 (29.2)	14,740 (27.4)	13,618 (25.3)	4,360 (8.1)	300 (0.6)	1,191 (2.2)	3,876 (7.2)	53,801 (100)
2003	15,716 (28.7)	14,740 (26.9)	14,518 (26.5)	4,360 (8.0)	303 (0.6)	1,191 (2.2)	3,878 (7.1)	54,708 (100)
2004	16,716 (28.6)	16,340 (27.9)	15,714 (26.9)	4,360 (7.5)	307 (0.5)	1,125 (1.9)	3,914 (6.7)	58,475 (100)
2005	17,716 (28.6)	16,840 (27.2)	16,814 (27.2)	4,360 (7.1)	307 (0.5)	1,325 (2.1)	4,485 (7.3)	61,846 (100)
2006	17,716 (27.1)	17,340 (26.6)	18,637 (28.5)	4,360 (6.7)	307 (0.5)	1,325 (2.0)	5,585 (8.6)	65,269 (100)
2007	17,716 (26.1)	18,840 (27.8)	19,537 (28.8)	4,510 (6.6)	307 (0.4)	1,325 (2.0)	5,585 (8.1)	67,819 (100)
2008	18,716 (26.1)	21,640 (30.2)	19,537 (27.3)	4,510 (6.3)	307 (0.4)	1,325 (1.9)	5,585 (7.8)	71,619 (100)
2009	20,716 (27.3)	22,940 (30.3)	20,437 (27.0)	4,510 (5.9)	307 (0.4)	1,325 (1.7)	5,585 (7.4)	75,819 (100)
2010	23,116 (29.2)	22,940 (29.0)	20,437 (25.9)	4,510 (5.7)	307 (0.4)	1,325 (1.7)	6,385 (8.1)	79,019 (100)
2011	24,516 (31.0)	22,440 (28.4)	20,437 (25.8)	3,810 (4.8)	142 (0.2)	1,325 (1.7)	6,385 (8.1)	79,054 (100)
2012	24,516 (31.2)	22,440 (28.5)	20,050 (25.5)	3,810 (4.9)	102 (0.1)	1,325 (1.7)	6,385 (8.1)	78,627 (100)
2013	23,837 (30.8)	22,440 (29.0)	20,050 (25.9)	3,410 (4.4)	102 (0.1)	1,200 (1.6)	6,385 (8.2)	77,423 (100)
2014	25,237 (32.7)	22,440 (29.1)	20,050 (26.0)	2,110 (2.7)	102 (0.1)	800 (1.1)	6,385 (8.3)	77,123 (100)
2015	26,637 (34.6)	21,440 (27.8)	19,550 (25.4)	2,110 (2.8)	102 (0.1)	800 (1.0)	6,385 (8.3)	77,023 (100)

6.3 Estimated Electricity Generation by Fuel Type (MPP)

(Unit : GWh, %)

Year	Nuclear	Coal	Anthracite	LNG	Heavy Oil	Light Oil	Hydro	PS	Orimulsion	Total
2001 (Actual)	112,133 (39.3)	105,098 (36.9)	5,235 (1.8)	30,451 (10.7)	27,770 (9.7)	386 (0.1)	1,821 (0.7)	2,330 (0.8)	-	285,224 (100)
2002	122,764 (40.5)	110,945 (36.6)	7,001 (2.3)	29,684 (9.8)	26,338 (8.7)	328 (0.1)	3,408 (1.1)	2,574 (0.9)	-	303,042 (100)
2003	122,913 (38.4)	114,109 (35.6)	5,956 (1.9)	43,599 (13.6)	24,481 (7.6)	1,373 (0.4)	4,054 (1.3)	2,377 (0.7)	1,385 (0.4)	320,247 (100.0)
2004	125,674 (37.8)	116,844 (35.1)	5,157 (1.5)	50,442 (15.2)	25,425 (7.6)	1,411 (0.4)	4,054 (1.2)	2,403 (0.7)	1,412 (0.4)	332,822 (100.0)
2005	134,083 (38.8)	127,153 (36.8)	5,502 (1.6)	45,638 (13.2)	23,362 (6.8)	1,445 (0.4)	4,054 (1.2)	2,602 (0.8)	1,377 (0.4)	345,216 (100.0)
2006	137,385 (38.4)	132,321 (37.0)	6,112 (1.7)	47,035 (13.2)	23,955 (6.7)	1,475 (0.4)	4,106 (1.1)	3,618 (1.0)	1,382 (0.4)	357,389 (100.0)
2007	136,672 (37.1)	138,461 (37.6)	6,098 (1.7)	51,662 (14.0)	24,229 (6.6)	1,504 (0.4)	4,106 (1.1)	4,151 (1.1)	1,400 (0.4)	368,283 (100.0)
2008	138,870 (36.7)	156,448 (41.4)	6,098 (1.6)	43,073 (11.4)	22,436 (5.9)	1,559 (0.4)	4,106 (1.1)	4,194 (1.1)	1,302 (0.3)	378,086 (100.0)
2009	149,601 (38.6)	172,017 (44.4)	6,098 (1.6)	30,497 (7.9)	17,976 (4.6)	1,579 (0.4)	4,106 (1.1)	4,221 (1.1)	1,076 (0.3)	387,171 (100.0)
2010	166,720 (42.1)	169,087 (42.7)	6,098 (1.5)	26,480 (6.7)	16,340 (4.1)	1,549 (0.4)	4,106 (1.0)	4,436 (1.1)	996 (0.3)	395,812 (100.0)
2011	183,379 (45.3)	163,245 (40.3)	6,097 (1.5)	26,342 (6.5)	14,346 (3.5)	1,230 (0.3)	4,106 (1.0)	5,054 (1.2)	1,002 (0.2)	404,801 (100.0)
2012	190,040 (46.0)	163,186 (39.5)	6,097 (1.5)	27,708 (6.7)	14,452 (3.5)	1,226 (0.3)	4,106 (1.0)	5,091 (1.2)	999 (0.2)	412,905 (100.0)
2013	183,307 (43.5)	167,428 (39.8)	5,706 (1.4)	38,164 (9.1)	15,851 (3.8)	1,263 (0.3)	4,106 (1.0)	5,142 (1.2)	-	420,967 (100.0)
2014	189,448 (44.2)	168,209 (39.2)	4,442 (1.0)	45,975 (10.7)	10,419 (2.4)	1,263 (0.3)	4,106 (1.0)	5,173 (1.2)	-	429,035 (100.0)
2015	201,258 (46.1)	160,956 (36.8)	4,442 (1.0)	48,966 (11.2)	10,745 (2.5)	1,237 (0.3)	4,106 (0.9)	5,189 (1.2)	-	436,899 (100.0)

6.4 Estimated Fuel Consumption based on MPP

Year	Coal (kTon)	Anthracite (kTon)	LNG (kTon)	Heavy Oil (Ml)	Light Oil (Ml)	Orimulsion (kTon)	CO_2 Emission (kTon)	Generation (GWh)	CO_2 Emission (kgC/kWh)
2001 (Actual)	37,919	2,875	4,791	5,497	107	-	36,589	285,224	0.1286
2002	39,969	2,850	4,659	5,499	451	-	38,686	303,042	0.1277
2003	42,223	2,852	5,682	5,774	466	442	39,618	320,247	0.1237
2004	43,227	2,456	6,544	5,981	492	455	40,997	332,822	0.1232
2005	46,985	2,607	5,900	5,509	509	446	42,619	345,216	0.1235
2006	48,875	2,857	6,067	5,656	515	447	44,265	357,389	0.1239
2007	51,111	2,857	6,645	5,718	522	453	46,281	368,283	0.1257
2008	57,619	2,857	5,568	5,325	535	422	49,334	378,086	0.1305
2009	63,206	2,857	4,011	4,326	541	350	50,829	387,171	0.1313
2010	62,095	2,857	3,508	3,959	534	324	49,343	395,812	0.1247
2011	59,813	2,857	3,496	3,517	446	326	47,379	404,801	0.1170
2012	59,794	2,857	3,667	3,442	446	325	47,443	412,905	0.1149
2013	61,383	2,659	4,964	3,740	453	-	49,544	420,967	0.1177
2014	61,678	2,019	5,952	2,471	453	-	49,132	429,035	0.1145
2015	58,908	2,019	6,337	2,545	447	-	47,683	436,899	0.1091

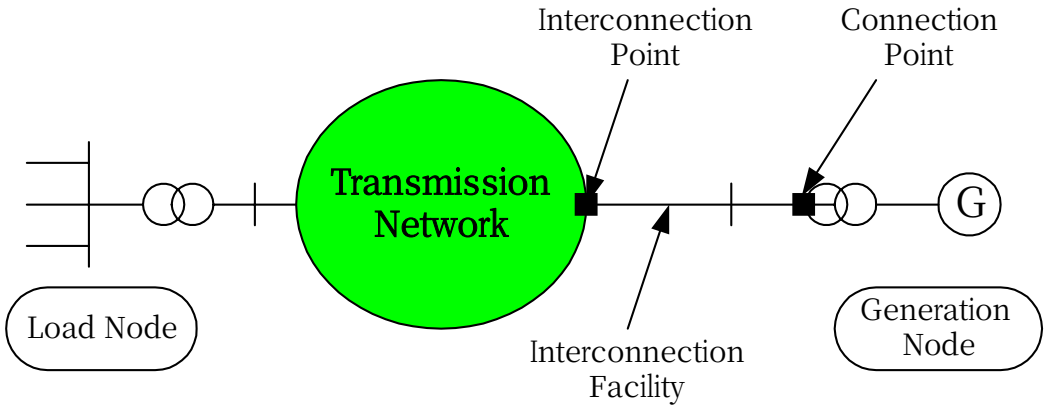
7. Transmission and Distribution Expansion Plan

7.1 Transmission interconnection procedure

○ The concept of transmission interconnection and interconnection facility

▪ The interconnection facility is a facility that connects the power plant with the transmission network.

▪ The transmission network is an all kinds of transmission and distribution related facility except the interconnection facility



○ Preliminary review on transmission network and interconnection facility expansion plan and study on pre-construction.

▪ A preliminary review is made once the basic plan is established (A detailed review is made once the application for transmission use has been made).

- Transmission service provider performs a pre-construction study on the facilities reinforced
- Pathway review (10 month), environmental impact assessment (17 month), government liaison and measurement (25 month)
- The generation company provides data needed for pre-construction study

○ Generation Business license and application for transmission use

- Generation companies submit the results of self-review on transmission interconnection when applying for the generation license.
  · Government licenses with consultation of transmission service provider's review.
- Generation companies that acquired the generation license are obliged to apply for the transmission interconnection following the transmission utilization rule

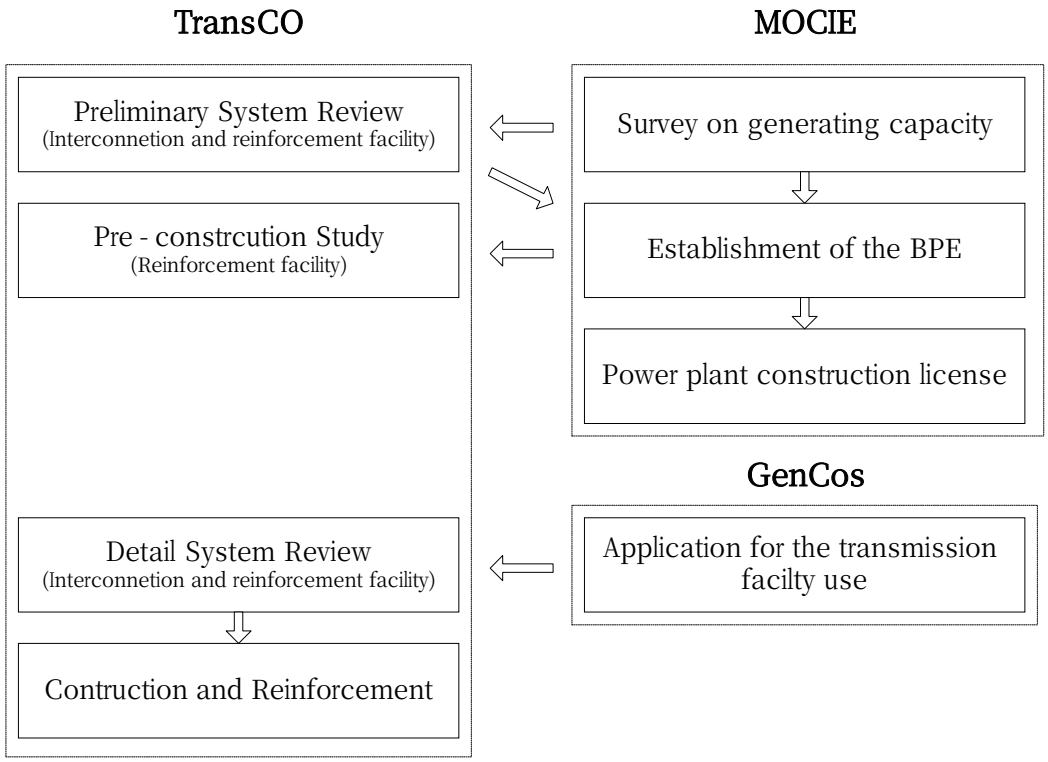
○ Construction of transmission network and interconnection facility
(transmission utilization rule is under revision)

- The transmission service provider constructs the interconnection facility and transmission network. However, who is to actually construct the interconnection facility can be determined through negotiation.
- The construction cost of the interconnection facility is allocated to the generating company and transmission service provider on the beneficiary principle basis. (allocation rate is determined at the committee)

○ The relation between transmission expansion plan and implementation plan

- The transmission expansion plan is based on the contracts between the user of transmission system and the transmission service provider
- The transmission expansion plan is implemented in pursuant to the user's modification of the plan, construction circumstances and transmission system conditions.

Figure A-1 Transmission Interconnection and Reinforcement Procedure



※ Korea Power Exchange support MOCIE

7.2 Construction Plan of Main Transmission Facilities

		Section	Length (km)	Comp-letion year	Necessity
765 kV	A	Dangjin Coal - Sinseosan(Sindangjin)	27	1998	○ Dangjin Coal plant interconnection ○ Initial operation at 345kV (Upgrade in 2002)
		Sinseosan(Sindangjin) - Sinansung)	150	2000	○ Transmission between the central districts and the Metropolitan area ○ Initial operation at 345kV (Upgrade in 2002)
		Sintaebaek - Singapyeong	155	2000	○ Uljin #3,4 interconnection (Upgrade in 2004)
		Sinansung - Singapyeong	75	2006	○ Interconnection between the Metropolitan area and rear system (the southern area-the eastern area)
		Seogyeongbuk - Sinansung	140	After 2011	○ Interconnection between generation in the Southern area and the Metropolitan area
	B	Uljin - Sintaebaek	49	2005	○ Future Uljin units interconnection
		Singori - Bukgeungnam	100	2008	○ Future Kori units (at the 2nd area) interconnection
		Bukgeungnam - Seogeungbuk	70	2008	
345 kV	A	Singapyeong - Migum	39	2004	○ 345kV system interconnection between Singapyeong and Migum
		Sinyongin - Sinsuwon	10	2004	○ power supply to Suwon
		Dongducheon - Yangju	51	2007	○ 345kV system interconnection between Dongducheon and Yangju
		Dongducheon - Singapyeong	64	2007	○ 345kV system interconnection between Dongducheon and Singapyeong
		Guangyang - Singangjin	10	2008	○ Transmission between Hadong Coal plant and the Daegu IPP
		Dongducheon - Sinpaju	45	2008	○ 345kV system interconnection between Dongducheon and Sinpaju
		Sinseosan - Sinonyang	47	2010	○ Interconnection between Dangjin Coal and the future Taean Coal units
		Seogeungbuk - Chungwon	80	2010	○ 345kV system interconnection between Seogeungbuk and Chungwon
	B	Taean - Sinseosan	49	2002	○ Future Taean Coal units interconnection
		Yeonghung - Sinsihung	38	2004	○ Yeonghung Coal plant interconnection
		Yangyang - Donghae	86	2005	○ Yangyang P.S. plant interconnection
		Daeguminga - Kwangyang	22	2005	○ Daegu IPP interconnection
		Chungsong branch	20	2006	○ Chungsong P.S. plant interconnection
		Songdo - Sinsihung(2)	20	2007	○ Songdo CC plant interconnection
		Seogyeongbuk - seonsan	30	2008	○ Future Kori units interconnection
		Boryung - Chungyang (Sinbuyeo)	32	2008	○ Future Boryung units interconnection
		Upgrade T/L of Wolsung & Sinwolsung N/P to 2Ⅱ	10	2009	○ Future Wolsung units interconnection
		Yeochun - Sinyeongju	20	2010	○ Yeochun P.S. plant interconnection

※ 1. The Construction plan might be changed in accordance with the result of KEPCO's system evaluation. The interconnection is tentative and will be firmly decided later.

2. The plan for 154kV transmission facilities is to construct T/L of 24,000C-km in length including the T/L between Sinae and Jungae prior to 2015.

3. A : Reinforcement, construction of transmission lines within the network

4. B : construction of transmission lines that interconnect the generating plants and the substations

7.3 Construction Plan of Main Transformation Facilities

		Substation Name	Region	Completion year	Necessity
765kV		Sinansung	Kyonggi Ansung	2002	○ power supply to the southern part of Metropolitan area
		Sinseosan	Chungnam Seosan	2002	○ Transmission of power from the Boryong Coal plant and the Taean Coal plant
		Singapyeong	Kyonggi Gapyeong	2004	○ Power supply the eastern part of Metropolitan area
		Sintaebaek	Gangwon Taebaek	2004	○ Transmission of power from Uljin nuclear plant
		Bukgyeongnam	Gyeongnam Changnyeong	2008	○ Transmission of power from future Kori units
		Seogyeongbuk	Gyeongbuk Sangju	2010	○ Transmission of power from future Kori units
345kV	A	Singkyeryong	Chungnam Nonsan	2002	○ Power supply to the southern part of Chungnam province
		Sinbupyeong	Kyonggi Buchon	2002	○ Power supply to the northern part of Incheon city
		Sinjincheon	Chungbuk Jincheon	2003	○ Power supply power to Chungju and Jincheon area
		Yongdungpo	Seoul yongdungpo	2003	○ Power supply to the southeastern part of Metropolitan area
		Sinyeongil	Gyeongbuk Pohang	2004	○ Power supply to Pohang and Yeongil area
		Sinsuwon	Kyonggi Hawsung	2004	○ Power supply to Yongin and Suwon area
		Sinansan	Kyonggi ansan	2004	○ Power supply to Ansan area
		Ulju	Gyeongnam Ulju	2005	○ Power supply to Ulsan and Ulju area
		Deagu	Dagu Dalsung	2005	○ Power supply to Daegu area
		Kwangju	Gyonggi Kwangju	2005	○ Power supply to Kwangju and yongin
		Dongducheon	Gyonggi Dongducheon	2007	○ Power supply to the northern part of Metropolitan area
		Sinyangyang	Kangwon Inje	2007	○ Power supply to the northern part of Yeongdong area
		Sinpaju	Kyonggi Paju	2008	○ System interconnection of the northern part of Metropolitan area
		Sinsihung#2	Kyonggi Sihung	2008	○ Power supply to the southwestern part of Metropolitan area
		Hyeonduk	Kyonggi Hwasung	2009	○ Power supply to the southern part of Metropolitan area
		Sinnoksan	Busan Gangsu	2010	○ Power supply to the southern part of Busan city
		*Sinonyang	Chungnam asan	2010	○ Transmission of power from Dangjin Coal plant and Taean Coal plant
		Dongbusan	Busan Namgu	After 2011	○ Power supply to the eastern part of Busan city
	B	*Sinbuyeo	Chungnam buyeo	2008	○ Transmission of power from Boryung Coal plant

※ 1. Substations with asterisk are .
2. The plan for 154kV transformation facilities is to construct 691 substations including relaying substations prior to 2015.
3. A : construction of transmission lines within the network
4. B : construction of transmission lines that interconnect the generating plants and the substations

7.4 Permitted Limits of Hypothetic Faults in Transmission and Transformation Facilities (Supposed to be enacted as the government standards)

Fault Conditions	Over Power factor	Limits	Available steps after a fault
· One line of the 345kV system connected to power plant · 1 Bank of the 345㎸ main transformer	Prohibit an over load (at nominal capacity)	· Prohibit load-drop · Prohibit generator-drop	· Prohibit an adjustment of generation power
· One line of the main system over 345kV · One line of the load-supply system below 345kV · One line of the system connected to power plant below 154kV	Permit a temporary over load	· Prohibit road-drop · Prohibit generator-drop	· Prohibit an adjustment of generation power · Permit a load-cutoff
· 1 Bank of 154kV main transformer	Same as above	· Permit a temporary road-drop (note 2) · Prohibit a permanent road-drop (note 3)	· Permit a load-cutoff
· One route of the load-supply system below 345kV · One route of the 154kV main system	Same as above	· Permit a temporary road-drop (note 2) · Prohibit a permanent road-drop (note 3) · Permit a generator-drop	· Permit a load-cutoff
· One route of the 345kV main system · One line of the 765kV main system	Same as above	· Prohibit a load-drop · Prohibit a generator- drop	· Prohibit an adjustment of generation power · Permit a load-cutoff
· One line of the 765kV system connected to power plant · One route of the 345kV system connected to power plant	Same as above	· Prohibit a load-drop · Permit a gernrator-drop	· Prohibit an adjustment of generation power

※ 1. It is an accepted standard to construct a 154kV self-loop system in each supply region of 345kV substation. If 345kV or 154kV substations are needed to extend to the final scale(4 banks), a new substation will be constructed.

2. A temporary road-drop is defined as the condition in which an interruption of power supply can be solved in a short time through a load-cutoff of other substations without a recovery of the facility failed.

3. A permanent road-drop is defined as the condition in which an interruption of power supply can't be solved in a short time through a load-cutoff of other substations without a recovery of the facility failed.

ACRONYMS

BPE : The 1st Basic Plan of Long Term Electricity Supply & Demand
CfD : Contract for Difference
DAELIM : Daelim Industrial Co., Ltd.
DAEWOO : Daewoo Engineering & Construction Co., Ltd.
DOE : Department of Energy
DSM : Demand Side Management
EBA : Electricity Business Act
EIA : Energy Information Administration
ESI : The Electricity Supply Industry
GAWIP : Gangwon Wind Power Co., Ltd.
KEPCO : Korea Electric Power Corporation
KEWESPO: Korea East-West Power Co., Ltd.
KHNP : Korea Hydro & Nuclear Power Co., Ltd.
KIECO : Korea Independent Energy Corps.
KOMIPO : Korea Midland Power Co., Ltd.
KOSEP : Korea South-East Power Co., Ltd.
KOSPO : Korea Southern Power Co., Ltd.
KOWACO : Korea Water Resources Corporation
KPX : Korea Power Exchange
LPDP : The Long Term Power Development Plan
MOCIE : Ministry of Commerce, Industry and Energy
MPP : The Most Probable Plan
NPPs : Nuclear Power Plants
WP : Korea Western Power Co., Ltd.