

KOREA
ENERGY BALANCE TABLES

2002										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production				1.2	25.7	5.1				31.9
Net Imports	35.1	106.4	27.8							169.3
TPED	34.5	105.8	27.4	1.2	25.7	5.1				199.7
Electricity and Heat Generation	-20.1	-5.9	-14.6	-1.2	-25.7	-4.8	25.3	3.2		-43.7
Petroleum Refineries		-16.5	-0.3							-16.7
Others	-5.9	-0.6				-0.1				-6.6
TFED	8.6	83.7	13.1			0.1	25.3	3.2		134.1
Industry	8.1	39.2	3.4				13.5	2.0		66.2
Transport		32.8	0.1				0.2			33.1
Residential	0.6	4.4	7.9			0.1	3.6	1.1		17.6
Commercial		7.3	1.7			0.1	7.9	0.1		17.2

2010										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production			0.4	1.7	31.7	9.4				43.1
Net Imports	44.4	110.3	43.5							198.2
TPED	44.4	110.3	43.9	1.7	31.7	9.4				241.3
Electricity and Heat Generation	-32.9	-5.3	-22.4	-1.7	-31.7	-9.2	37.2	5.6		-60.4
Petroleum Refineries		-5.0	-0.3							-5.3
Others		-0.6								-0.6
TFED	11.5	99.4	21.1			0.2	37.2	5.6		175.1
Industry	11.4	43.2	6.6				19.2	3.5		83.9
Transport		45.8	0.1				0.3			46.3
Residential	0.1	3.4	11.4			0.1	5.2	1.9		22.2
Commercial		6.9	3.0			0.1	12.5	0.2		22.7

2020										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production				1.6	49.6	13.3				64.6
Net Imports	53.8	125.0	60.2							238.9
TPED	53.8	125.0	60.2	1.6	49.6	13.3				303.5
Electricity and Heat Generation	-39.2	-4.3	-30.2	-1.6	-49.6	-13.0	50.3	7.4		-80.4
Petroleum Refineries		-4.7	-0.3							-5.1
Others		-0.1								-0.1
TFED	14.5	115.8	29.6			0.3	50.3	7.4		218.0
Industry	14.5	50.5	10.8				26.3	4.8		106.9
Transport		55.5	0.3				0.5			56.2
Residential		3.2	14.1			0.2	5.9	2.3		25.8
Commercial		6.7	4.5			0.1	17.6	0.3		29.1

2030										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production				1.9	62.4	16.1				80.3
Net Imports	62.8	135.6	72.9							271.3
TPED	62.8	135.6	72.9	1.9	62.4	16.1				351.7
Electricity and Heat Generation	-45.8	-4.7	-35.7	-1.9	-62.4	-15.7	61.1	8.9		-96.1
Petroleum Refineries		-4.9	-0.3							-5.2
Others		-0.1								-0.1
TFED	16.9	125.9	36.9			0.4	61.1	8.9		250.2
Industry	16.9	54.7	14.2				32.6	5.9		124.3
Transport		61.8	0.4				0.6			62.7
Residential		3.0	16.4			0.3	6.3	2.7		28.7
Commercial		6.5	5.9			0.1	21.6	0.4		34.4

KOREA

MACRO ASSUMPTIONS

	1980	2002	2010	2020	2030	Growth Rate (% per annum)				
						80-02	02-10	10-20	20-30	02-30
GDP (2000 PPP US\$ billion)	149	662	982	1 393	1 786	7.0	5.0	3.6	2.5	3.6
Population (million)	38.5	47.8	49.7	50.7	50.3	1.0	0.5	0.2	- 0.1	0.2
GDP per capita (2000 PPP US\$)	3 856	13 862	19 781	27 489	35 463	6.0	4.5	3.3	2.6	3.4
GDP in Services (2000 PPP US\$ billion)	70	329	447	630	813	7.3	3.9	3.5	2.6	3.3
GDP in Industry (2000 PPP US\$ billion)	39	242	389	575	760	8.6	6.1	4.0	2.8	4.2
Urbanisation level (%)	57	80	82	84	86	1.6	0.3	0.3	0.2	0.3

ENERGY PROJECTIONS

	1980	2002	2010	2020	2030	Growth rate (% per annum)				
						80-02	02-10	10-20	20-30	02-30
Production	9.3	31.9	43.1	64.6	80.3	5.8	3.8	4.1	2.2	3.3
Coal	8.2 (88%)									
Oil										
Gas										
Hydro	0.2 (0%)	1.2 (4%)	1.7 (4%)	1.6 (3%)	1.9 (2%)	9.1	4.7	- 0.4	1.4	1.7
NRE		5.1 (16%)	9.4 (22%)	13.3 (21%)	16.1 (20%)		8.0	3.6	1.9	4.2
Nuclear	0.9 (10%)	25.7 (81%)	31.7 (73%)	49.6 (77%)	62.4 (78%)	16.4	2.6	4.6	2.3	3.2
Net Imports	30.7	169.3	198.2	238.9	271.3	8.1	2.0	1.9	1.3	1.7
Coal	3.5	35.1	44.4	53.8	62.8	11.1	3.0	1.9	1.6	2.1
Oil	27.2	106.4	110.3	125.0	135.6	6.4	0.4	1.3	0.8	0.9
Gas		27.8	43.5	60.2	72.9		5.8	3.3	1.9	3.5
Electricity										
Total Primary Energy Demand	41.4	199.7	241.3	303.5	351.7	7.4	2.4	2.3	1.5	2.0
Coal	13.5 (33%)	34.5 (17%)	44.4 (18%)	53.8 (18%)	62.8 (18%)	4.4	3.2	1.9	1.6	2.2
Oil	26.8 (65%)	105.8 (53%)	110.3 (46%)	125.0 (41%)	135.6 (39%)	6.4	0.5	1.3	0.8	0.9
Gas		27.4 (14%)	43.9 (18%)	60.2 (20%)	72.9 (21%)		6.1	3.2	1.9	3.6
Hydro	0.2 (0%)	1.2 (1%)	1.7 (1%)	1.6 (1%)	1.9 (1%)	9.1	4.7	- 0.4	1.4	1.7
NRE		5.1 (3%)	9.4 (4%)	13.3 (4%)	16.1 (5%)		8.0	3.6	1.9	4.2
Nuclear	0.9 (2%)	25.7 (13%)	31.7 (13%)	49.6 (16%)	62.4 (18%)	16.4	2.6	4.6	2.3	3.2
Input for Electricity and Heat Generation	- 8.4	- 72.2	- 103.2	- 138.1	- 166.1	10.3	4.6	3.0	1.9	3.0
Coal	- 0.8 (10%)	- 20.1 (28%)	- 32.9 (32%)	- 39.2 (28%)	- 45.8 (28%)	15.5	6.4	1.8	1.6	3.0
Oil	- 6.4 (77%)	- 5.9 (8%)	- 5.3 (5%)	- 4.3 (3%)	- 4.7 (3%)	- 0.4	- 1.3	- 2.0	0.8	- 0.8
Gas		- 14.6 (20%)	- 22.4 (22%)	- 30.2 (22%)	- 35.7 (21%)		5.5	3.0	1.7	3.2
Hydro	- 0.2 (2%)	- 1.2 (2%)	- 1.7 (2%)	- 1.6 (1%)	- 1.9 (1%)	9.1	4.7	- 0.4	1.4	1.7
NRE		- 4.8 (7%)	- 9.2 (9%)	- 13.0 (9%)	- 15.7 (9%)		8.4	3.6	1.9	4.3
Nuclear	- 0.9 (11%)	- 25.7 (36%)	- 31.7 (31%)	- 49.6 (36%)	- 62.4 (38%)	16.4	2.6	4.6	2.3	3.2
Other Transformation	- 1.4	- 23.3	- 5.9	- 5.2	- 5.4	13.7	- 15.8	- 1.3	0.4	- 5.1
Coal	- 1.0 (70%)	- 5.9 (25%)				8.5				
Oil	- 0.4 (30%)	- 17.0 (73%)	- 5.6 (95%)	- 4.8 (94%)	- 5.0 (94%)	18.4	- 13.0	- 1.4	0.4	- 4.3
Gas		- 0.3 (1%)	- 0.3 (5%)	- 0.3 (6%)	- 0.3 (6%)		1.4	0.8	0.3	0.8
NRE		- 0.1 (1%)								
Electricity										
Heat										

KOREA

	Mtoe					Growth rate (% per annum)				
	1980	2002	2010	2020	2030	80-02	02-10	10-20	20-30	02-30
Total Final Energy Demand	27.2	134.1	175.1	218.0	250.2	7.5	3.4	2.2	1.4	2.3
Coal	9.7 (36%)	8.6 (6%)	11.5 (7%)	14.5 (7%)	16.9 (7%)	-0.6	3.7	2.4	1.6	2.4
Oil	14.6 (54%)	83.7 (62%)	99.4 (57%)	115.8 (53%)	125.9 (50%)	8.3	2.2	1.5	0.8	1.5
Gas		13.1 (10%)	21.1 (12%)	29.6 (14%)	36.9 (15%)		6.2	3.4	2.2	3.8
NRE		0.1 (0%)	0.2 (0%)	0.3 (0%)	0.4 (0%)		6.0	3.5	2.6	3.9
Electricity	2.8 (10%)	25.3 (19%)	37.2 (21%)	50.3 (23%)	61.1 (24%)	10.5	4.9	3.1	2.0	3.2
Heat		3.2 (2%)	5.6 (3%)	7.4 (3%)	8.9 (4%)		7.0	2.9	1.8	3.7
Industry	13.3	66.2	83.9	106.9	124.3	7.6	3.0	2.5	1.5	2.3
Coal	1.3 (10%)	8.1 (12%)	11.4 (14%)	14.5 (14%)	16.9 (14%)	8.5	4.4	2.5	1.6	2.7
Oil	9.9 (75%)	39.2 (59%)	43.2 (52%)	50.5 (47%)	54.7 (44%)	6.4	1.2	1.6	0.8	1.2
Gas		3.4 (5%)	6.6 (8%)	10.8 (10%)	14.2 (11%)		8.6	5.0	2.8	5.2
NRE							14.7	5.2	7.2	8.6
Electricity	2.0 (15%)	13.5 (20%)	19.2 (23%)	26.3 (25%)	32.6 (26%)	9.1	4.5	3.2	2.2	3.2
Heat		2.0 (3%)	3.5 (4%)	4.8 (5%)	5.9 (5%)		7.5	3.2	2.0	4.0
Transport	2.1	33.1	46.3	56.2	62.7	13.3	4.3	2.0	1.1	2.3
Coal										
Oil	2.1 (98%)	32.8 (99%)	45.8 (99%)	55.5 (99%)	61.8 (98%)	13.3	4.3	1.9	1.1	2.3
Gas		0.1 (0%)	0.1 (0%)	0.3 (0%)	0.4 (1%)		9.1	5.7	5.0	6.4
NRE										
Electricity		0.2 (1%)	0.3 (1%)	0.5 (1%)	0.6 (1%)	8.7	5.5	3.7	2.2	3.7
Residential	9.2	17.6	22.2	25.8	28.7	3.0	2.9	1.5	1.1	1.8
Coal	8.3 (90%)	0.6 (3%)	0.1 (1%)	0.02	0.002	-11.6	-17.0	-18.1	-19.3	-18.2
Oil	0.5 (5%)	4.4 (25%)	3.4 (15%)	3.2 (12%)	3.0 (11%)	10.6	-3.0	-0.7	-0.5	-1.3
Gas		7.9 (45%)	11.4 (51%)	14.1 (55%)	16.4 (57%)		4.7	2.2	1.5	2.7
NRE		0.1 (0%)	0.1 (1%)	0.2 (1%)	0.3 (1%)		8.0	3.8	2.7	4.6
Electricity	0.5 (5%)	3.6 (21%)	5.2 (24%)	5.9 (23%)	6.3 (22%)	9.9	4.7	1.3	0.6	2.0
Heat		1.1 (6%)	1.9 (8%)	2.3 (9%)	2.7 (9%)		6.5	2.2	1.5	3.1
Commercial	2.6	17.2	22.7	29.1	34.4	9.0	3.6	2.5	1.7	2.5
Coal	0.1 (4%)									
Oil	2.1 (82%)	7.3 (43%)	6.9 (31%)	6.7 (23%)	6.5 (19%)	5.8	-0.7	-0.4	-0.4	-0.5
Gas		1.7 (10%)	3.0 (13%)	4.5 (15%)	5.9 (17%)		7.6	4.0	2.8	4.6
NRE		0.1 (0%)	0.1 (0%)	0.1 (0%)	0.1 (0%)		3.0	2.9	2.3	2.7
Electricity	0.4 (14%)	7.9 (46%)	12.5 (55%)	17.6 (60%)	21.6 (63%)	15.2	5.8	3.5	2.1	3.6
Heat		0.1 (1%)	0.2 (1%)	0.3 (1%)	0.4 (1%)		3.9	3.5	2.6	3.3

ENERGY SECURITY

	1980	2002	2010	2020	2030
Diversity of Primary Energy Demand (Rated between 1 and 100)	50	74	83	87	89
Net Energy Import Ratio (%)	77	84	82	79	77
Net Oil Import Dependency (%)	100	100	100	100	100

KOREA
ELECTRICITY GENERATION

	1980	2002	2010	2020	2030	Growth rate (% per annum)				
						80-02	02-10	10-20	20-30	02-30
Total Electricity Generation (TWh)	37	330	456	612	733	10.4	4.1	3.0	1.8	2.9
Coal	2 (7%)	134 (41%)	201 (44%)	243 (40%)	284 (39%)	19.9	5.2	1.9	1.6	2.7
Oil	29 (79%)	32 (10%)	20 (4%)	10 (2%)	10 (1%)	0.3	-5.8	-6.2	-0.3	-4.0
Gas		42 (13%)	63 (14%)	91 (15%)	114 (16%)		5.3	3.8	2.2	3.6
Hydro	2 (5%)	3 (1%)	18 (4%)	15 (2%)	13 (2%)	2.2	24.0	-1.9	-1.4	5.1
NRE			11 (3%)	25 (4%)	30 (4%)			8.1	1.7	
Nuclear	3 (9%)	119 (36%)	144 (31%)	227 (37%)	283 (39%)	17.4	2.4	4.7	2.2	3.1
Total Installed Generation Capacity (GW)	9	55	92	118	153	8.3	6.6	2.5	2.6	3.7
Thermal	8 (81%)	35 (64%)	60 (65%)	71 (61%)	92 (60%)	7.2	6.9	1.7	2.6	3.5
Coal	2 (21%)	17 (31%)	32 (35%)	39 (33%)	49 (32%)	10.2	8.3	1.9	2.4	3.9
Oil	6 (59%)	5 (8%)	5 (5%)	4 (3%)	5 (3%)	-0.8	0.7	-3.1	3.0	0.1
Gas		14 (25%)	23 (25%)	29 (25%)	38 (25%)		6.8	2.3	2.7	3.7
Hydro	1 (13%)	4 (7%)	6 (7%)	7 (6%)	10 (7%)	5.5	6.2	1.3	3.4	3.4
NRE			5 (5%)	10 (8%)	11 (7%)			7.8	1.3	
Nuclear	1 (6%)	16 (29%)	21 (23%)	29 (25%)	40 (26%)	16.0	3.5	3.6	3.0	3.4

ENERGY INTENSITY & CO₂ EMISSIONS

	1980	2002	2010	2020	2030	Growth Rates (% per annum)				
						80-02	02-10	10-20	20-30	02-30
Energy Intensity (toe per US\$ million GDP)	279	301	246	218	197	0.4	-2.5	-1.2	-1.0	-1.5
Industry (toe per US\$ million GDP in Industry)	336	273	215	186	164	-0.9	-2.9	-1.5	-1.3	-1.8
Commercial (toe per US\$ million GDP in Services)	36	52	51	46	42	1.6	-0.3	-0.9	-0.9	-0.7
Energy Intensity (kgoe per capita)	1 074	4 179	4 861	5 990	6 985	6.4	1.9	2.1	1.5	1.9
Industry	344	1 385	1 690	2 109	2 469	6.5	2.5	2.2	1.6	2.1
Transport	55	692	932	1 109	1 246	12.2	3.8	1.8	1.2	2.1
Residential	240	369	446	510	570	2.0	2.4	1.3	1.1	1.6
Commercial	66	359	457	575	684	8.0	3.1	2.3	1.8	2.3
CO₂ Emissions (million tonnes)	111	480	608	715	811	6.9	3.0	1.6	1.3	1.9
Electricity Generation	24	152	202	228	268	8.8	3.6	1.2	1.6	2.1
Transformation other than Electricity Generation	9	12	12	12	11	1.0	-0.1	-0.2	-0.2	-0.2
Industry	31	158	191	235	265	7.7	2.4	2.1	1.2	1.9
Transport	6	98	138	167	186	13.4	4.3	1.9	1.1	2.3
Residential	34	34	37	43	48		1.3	1.4	1.1	1.2
Commercial	7	26	28	31	34	6.4	0.9	0.9	0.8	0.9
CO₂ Emissions Intensity										
CO ₂ emissions per GDP (tonnes per US\$ million)	746	725	619	513	454	-0.1	-2.0	-1.9	-1.2	-1.7
CO ₂ emissions per capita (tonnes per capita)	2.9	10.1	12.2	14.1	16.1	5.9	2.5	1.4	1.3	1.7

ENERGY INVESTMENT REQUIREMENTS

(Cumulative from 2003 -)	2010	2020	2030
Total (2000 US\$ billion)	76.2 - 91.2	152.8 - 185.6	227.3 - 276.2
Coal Production & Transportation			
Oil & Gas Production & Processing	4.76 - 6.81	10.68 - 15.35	14.97 - 21.54
Oil & Gas International Trade	9.80 - 10.31	20.35 - 21.93	26.69 - 29.26
Oil & Gas Domestic Pipeline	1.44 - 2.06	2.90 - 4.14	4.03 - 5.76
Electricity Generation & Transmission	60.24 - 72.05	118.85 - 144.15	181.63 - 219.68