

INDONESIA
ENERGY BALANCE TABLES

2002										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production	75.4	63.5	73.4	0.9		45.7				258.9
Net Imports	- 56.1	- 1.5	- 33.8							- 91.4
TPED	18.7	63.0	39.7	0.9		45.7				168.0
Electricity and Heat Generation	- 9.4	- 3.3	- 6.7	- 0.9		- 4.5	7.6			- 17.2
Petroleum Refineries		- 12.1	- 1.1							- 13.1
Others	- 3.7		- 21.2							- 24.8
TFED	5.7	46.9	10.7			41.2	7.5			112.0
Industry	5.7	11.6	10.6			2.0	3.2			33.1
Transport		23.7								23.7
Residential		10.5				39.0	2.9			52.5
Commercial		1.2				0.2	1.4			2.8

2010										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production	126.4	65.0	112.5	0.9		52.9				357.7
Net Imports	- 87.0	14.5	- 54.5				0.2			- 126.8
TPED	39.4	79.5	58.1	0.9		52.9	0.2			231.0
Electricity and Heat Generation	- 20.0	- 3.3	- 8.8	- 0.9		- 7.6	11.9			- 28.7
Petroleum Refineries		- 15.3	- 1.3							- 16.6
Others	- 9.8		- 33.7							- 43.5
TFED	9.5	60.9	14.2			45.3	12.2			142.2
Industry	9.5	16.2	14.1			2.6	5.0			47.4
Transport		32.8								32.9
Residential		10.5				42.5	4.8			57.9
Commercial		1.4				0.2	2.3			4.0

2020										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production	138.2	55.6	111.5	1.3		57.1				363.7
Net Imports	- 82.6	47.7	- 39.8				0.5			- 74.2
TPED	55.6	103.2	71.7	1.3		57.1	0.5			289.5
Electricity and Heat Generation	- 30.3	- 1.5	- 16.0	- 1.3		- 6.0	18.4			- 36.7
Petroleum Refineries		- 19.4	- 1.6							- 21.0
Others	- 10.7		- 31.4							- 42.1
TFED	14.5	82.4	22.7			51.2	18.9			189.7
Industry	14.5	22.6	22.5			3.5	7.7			70.8
Transport		47.8								47.8
Residential		10.4				47.4	7.3			65.1
Commercial		1.6	0.1			0.3	3.9			5.9

2030										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production	145.3	54.9	90.6	1.8		65.2				357.8
Net Imports	- 77.0	81.3	- 4.0				0.5			0.8
TPED	68.3	136.2	86.7	1.8		65.2	0.5			358.6
Electricity and Heat Generation	- 36.7	- 1.4	- 24.3	- 1.8		- 8.9	25.9			- 47.1
Petroleum Refineries		- 24.9	- 2.0							- 26.9
Others	- 11.3		- 26.7							- 38.0
TFED	20.3	109.9	33.7			56.3	26.4			246.7
Industry	20.3	29.5	33.5			4.7	10.7			98.6
Transport		68.6	0.1							68.7
Residential		9.9	0.1			51.3	9.5			70.9
Commercial		1.9	0.1			0.3	6.2			8.5

INDONESIA

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)	273	790	1 152	1 809	2 795	5.0	4.8	4.6	4.4	4.6
Population (million)	148	212	233	258	276	1.6	1.2	1.0	0.7	1.0
GDP per capita (2000 PPP US\$)	1 838	3 729	4 944	7 021	10 116	3.3	3.6	3.6	3.7	3.6
GDP in Services (2000 PPP US\$ billion)	107	283	467	782	1 276	4.5	6.5	5.3	5.0	5.5
GDP in Industry (2000 PPP US\$ billion)	86	246	332	519	788	4.9	3.8	4.6	4.3	4.3
Urbanisation level (%)	22	44	53	62	68	3.2	2.3	1.5	0.9	1.5

ENERGY PROJECTIONS

	Mtoe					Growth rate (% per annum)				
	1980	2002	2010	2020	2030	80-02	02-10	10-20	20-30	02-30
Production	125.0	258.9	357.7	363.7	357.8	3.4	4.1	0.2	-0.2	1.2
Coal		75.4 (29%)	126.4 (35%)	138.2 (38%)	145.3 (41%)		6.7	0.9	0.5	2.4
Oil	80.0 (64%)	63.5 (25%)	65.0 (18%)	55.6 (15%)	54.9 (15%)	-1.0	0.3	-1.6	-0.1	-0.5
Gas	15.0 (12%)	73.4 (28%)	112.5 (31%)	111.5 (31%)	90.6 (25%)	7.5	5.5	-0.1	-2.0	0.8
Hydro	0.2 (0%)	0.9 (0%)	0.9 (0%)	1.3 (0%)	1.8 (0%)	7.0	1.2	3.6	2.8	2.6
NRE	29.7 (24%)	45.7 (18%)	52.9 (15%)	57.1 (16%)	65.2 (18%)	2.0	1.8	0.8	1.3	1.3
Nuclear										
Net Imports	- 68.1	- 91.4	- 126.8	- 74.2	0.8	1.3	4.2	- 5.2		
Coal		- 56.1	- 87.0	- 82.6	- 77.0		5.6	- 0.5	- 0.7	1.1
Oil	- 58.1	- 1.5	14.5	47.7	81.3	-15.3		12.6	5.5	
Gas	- 10.0	- 33.8	- 54.5	- 39.8	- 4.0	5.7	6.2	- 3.1	-20.6	- 7.3
Electricity			0.2	0.5	0.5			9.1		
Total Primary Energy Demand	56.0	168.0	231.0	289.5	358.6	5.1	4.1	2.3	2.2	2.7
Coal	0.2 (0%)	18.7 (11%)	39.4 (17%)	55.6 (19%)	68.3 (19%)	23.9	9.7	3.5	2.1	4.7
Oil	21.0 (38%)	63.0 (38%)	79.5 (34%)	103.2 (36%)	136.2 (38%)	5.1	2.9	2.6	2.8	2.8
Gas	4.9 (9%)	39.7 (24%)	58.1 (25%)	71.7 (25%)	86.7 (24%)	9.9	4.9	2.1	1.9	2.8
Hydro	0.2 (0%)	0.9 (1%)	0.9 (0%)	1.3 (0%)	1.8 (0%)	7.0	1.2	3.6	2.8	2.6
NRE	29.6 (53%)	45.7 (27%)	52.9 (23%)	57.1 (20%)	65.2 (18%)	2.0	1.8	0.8	1.3	1.3
Nuclear										
Input for Electricity and Heat Generation	- 2.3	- 24.8	- 40.7	- 55.1	- 73.0	11.3	6.4	3.1	2.9	3.9
Coal		- 9.4 (38%)	- 20.0 (49%)	- 30.3 (55%)	- 36.7 (50%)		9.9	4.2	1.9	5.0
Oil	- 2.1 (92%)	- 3.3 (13%)	- 3.3 (8%)	- 1.5 (3%)	- 1.4 (2%)	2.0	0.1	- 7.6	- 0.9	- 3.1
Gas		- 6.7 (27%)	- 8.8 (22%)	- 16.0 (29%)	- 24.3 (33%)		3.5	6.1	4.3	4.7
Hydro	- 0.2 (8%)	- 0.9 (3%)	- 0.9 (2%)	- 1.3 (2%)	- 1.8 (2%)	7.0	1.2	3.6	2.8	2.6
NRE		- 4.5 (18%)	- 7.6 (19%)	- 6.0 (11%)	- 8.9 (12%)		6.7	- 2.3	4.1	2.5
Nuclear										
Other Transformation	- 2.3	- 38.0	- 60.1	- 63.1	- 64.8	13.7	5.9	0.5	0.3	1.9
Coal	- 0.04 (2%)	- 3.7 (10%)	- 9.8 (16%)	- 10.7 (17%)	- 11.3 (17%)	23.1	13.1	0.9	0.5	4.1
Oil	- 1.1 (47%)	- 12.1 (32%)	- 15.3 (25%)	- 19.4 (31%)	- 24.9 (38%)	11.7	3.0	2.4	2.5	2.6
Gas	- 1.2 (51%)	- 22.2 (59%)	- 35.0 (58%)	- 33.0 (52%)	- 28.6 (44%)	14.4	5.8	- 0.6	- 1.4	0.9
NRE										
Electricity										
Heat										

INDONESIA

	Mtoe					Growth rate (% per annum)				
	1980	2002	2010	2020	2030	80-02	02-10	10-20	20-30	02-30
Total Final Energy Demand	47.8	112.0	142.2	189.7	246.7	3.9	3.0	2.9	2.7	2.9
Coal	0.1 (0%)	5.7 (5%)	9.5 (7%)	14.5 (8%)	20.3 (8%)	18.0	6.7	4.3	3.4	4.7
Oil	17.2 (36%)	46.9 (42%)	60.9 (43%)	82.4 (43%)	109.9 (45%)	4.7	3.3	3.1	2.9	3.1
Gas	2.4 (5%)	10.7 (10%)	14.2 (10%)	22.7 (12%)	33.7 (14%)	7.1	3.6	4.8	4.0	4.2
NRE	27.8 (58%)	41.2 (37%)	45.3 (32%)	51.2 (27%)	56.3 (23%)	1.8	1.2	1.2	1.0	1.1
Electricity	0.4 (1%)	7.5 (7%)	12.2 (9%)	18.9 (10%)	26.4 (11%)	14.9	6.3	4.5	3.4	4.6
Heat										
Industry	8.3	33.1	47.4	70.8	98.6	6.5	4.6	4.1	3.4	4.0
Coal	0.1 (2%)	5.7 (17%)	9.5 (20%)	14.5 (21%)	20.3 (21%)	18.6	6.7	4.3	3.4	4.7
Oil	5.7 (68%)	11.6 (35%)	16.2 (34%)	22.6 (32%)	29.5 (30%)	3.3	4.3	3.4	2.7	3.4
Gas	2.4 (28%)	10.6 (32%)	14.1 (30%)	22.5 (32%)	33.5 (34%)	7.1	3.6	4.8	4.0	4.2
NRE		2.0 (6%)	2.6 (5%)	3.5 (5%)	4.7 (5%)		3.2	3.1	2.8	3.0
Electricity	0.2 (2%)	3.2 (10%)	5.0 (11%)	7.7 (11%)	10.7 (11%)	14.8	5.9	4.3	3.4	4.4
Heat										
Transport	6.2	23.7	32.9	47.8	68.7	6.3	4.2	3.8	3.7	3.9
Coal										
Oil	6.2 (100%)	23.7 (100%)	32.8 (100%)	47.8 (100%)	68.6 (100%)	6.3	4.2	3.8	3.7	3.9
Gas		0.03 (0%)	0.04 (0%)	0.1 (0%)	0.1 (0%)		1.5	3.6	4.1	3.2
NRE										
Electricity										
Residential	33.3	52.5	57.9	65.1	70.9	2.1	1.2	1.2	0.9	1.1
Coal										
Oil	5.3 (16%)	10.5 (20%)	10.5 (18%)	10.4 (16%)	9.9 (14%)	3.2		-0.2	-0.4	-0.2
Gas		0.02 (0%)	0.02 (0%)	0.03 (0%)	0.1 (0%)		4.9	4.1	4.7	4.5
NRE	27.8 (83%)	39.0 (74%)	42.5 (73%)	47.4 (73%)	51.3 (72%)	1.6	1.1	1.1	0.8	1.0
Electricity	0.2 (1%)	2.9 (6%)	4.8 (8%)	7.3 (11%)	9.5 (13%)	13.0	6.4	4.3	2.7	4.3
Heat										
Commercial		2.8	4.0	5.9	8.5		4.6	4.0	3.6	4.0
Coal										
Oil ¹		1.2 (41%)	1.4 (34%)	1.6 (28%)	1.9 (22%)		2.2	1.8	1.2	1.7
Gas ¹		0.03 (1%)	0.1 (1%)	0.1 (1%)	0.1 (2%)		7.0	5.6	5.1	5.8
NRE ¹		0.2 (8%)	0.2 (6%)	0.3 (5%)	0.3 (4%)		1.3	1.0	1.0	1.1
Electricity ¹		1.4 (50%)	2.3 (58%)	3.9 (66%)	6.2 (73%)		6.7	5.3	4.6	5.5
Heat										

Note: 1 Historical data prior to 2002 are from national sources.

ENERGY SECURITY

	1980	2002	2010	2020	2030
Diversity of Primary Energy Demand (Rated between 1 and 100)	62	84	88	88	86
Net Energy Import Ratio (%)	-120	-55	-55	-26	0
Net Oil Import Dependency (%)	-276	-2	18	46	60

INDONESIA
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)	8	95	151	231	324	11.9	5.9	4.4	3.5	4.5
Coal		30 (32%)	69 (46%)	118 (51%)	159 (49%)		10.8	5.5	3.0	6.1
Oil	6 (72%)	16 (17%)	16 (11%)	7 (3%)	7 (2%)	4.7	0.2	-7.5	-0.8	-3.0
Gas		34 (35%)	45 (30%)	83 (36%)	127 (39%)		3.6	6.3	4.4	4.8
Hydro	2 (28%)	10 (10%)	11 (7%)	16 (7%)	20 (6%)	7.0	1.2	3.6	2.8	2.6
NRE		5 (5%)	9 (6%)	8 (3%)	11 (3%)		7.6	-2.1	3.8	2.7
Nuclear										
Total Installed Generation Capacity (GW)	3	28	41	81	108	11.5	4.8	7.0	2.9	4.9
Thermal	2 (85%)	24 (83%)	35 (85%)	71 (87%)	95 (88%)	11.4	5.0	7.3	3.0	5.1
Coal		7 (26%)	14 (35%)	36 (44%)	50 (46%)		8.9	9.7	3.4	7.1
Oil	2 (84%)	8 (28%)	7 (18%)	5 (6%)	5 (5%)	6.1	-0.8	-3.4		-1.5
Gas		8 (30%)	13 (32%)	30 (36%)	40 (37%)		5.8	8.4	3.1	5.7
Hydro	0.4 (15%)	4 (13%)	4 (9%)	7 (9%)	9 (8%)	10.5	0.9	6.6	2.1	3.3
NRE		1 (4%)	2 (6%)	3 (4%)	4 (4%)		10.3	1.9	3.3	4.8
Nuclear										

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)	205	213	201	160	128	0.2	-0.7	-2.2	-2.2	-1.8
Industry (toe per US\$ million GDP in Industry)	97	135	143	137	125	1.5	0.7	-0.4	-0.9	-0.3
Commercial (toe per US\$ million GDP in Services)		10	9	8	7		-1.7	-1.2	-1.3	-1.4
Energy Intensity (kgoe per capita)	377	794	992	1 124	1 298	3.4	2.8	1.3	1.5	1.8
Industry	56	156	204	275	357	4.8	3.4	3.0	2.6	3.0
Transport	42	112	141	186	249	4.6	2.9	2.8	3.0	2.9
Residential	224	248	248	253	256	0.5	0.0	0.2	0.2	0.1
Commercial		13	17	23	31		3.4	2.9	2.9	3.1
CO₂ Emissions (million tonnes)	70.0	291.8	415.5	571.2	745.9	6.7	4.5	3.2	2.7	3.4
Electricity Generation	6.8	62.2	108.3	159.4	203.4	10.6	7.2	3.9	2.5	4.3
Transformation other than Electricity Generation	5.1	41.6	54.0	55.4	56.0	10.0	3.3	0.3	0.1	1.1
Industry	23.5	82.0	119.1	177.7	246.5	5.8	4.8	4.1	3.3	4.0
Transport	18.4	70.4	97.7	141.9	203.7	6.3	4.2	3.8	3.7	3.9
Residential	15.8	32.0	32.1	31.6	30.3	3.3		-0.2	-0.4	-0.2
Commercial	0.3	3.6	4.3	5.2	6.0	11.8	2.2	1.9	1.4	1.8
CO₂ Emissions Intensity										
CO ₂ emissions per GDP (tonnes per US\$ million)	256.6	369.6	360.8	315.8	266.9	1.7	-0.3	-1.3	-1.7	-1.2
CO ₂ emissions per capita (tonnes per capita)	0.5	1.4	1.8	2.2	2.7	5.0	3.3	2.2	2.0	2.4

ENERGY INVESTMENT REQUIREMENTS

(Cumulative from 2003 -)	2010	2020	2030
Total (2000 US\$ billion)	65.0 - 83.6	147.6 - 184.4	218.8 - 274.4
Coal Production & Transportation	6.2 - 8.1	8.7 - 11.4	10.5 - 14.0
Oil & Gas Production & Processing	17.3 - 25.6	26.8 - 39.2	38.2 - 55.7
Oil & Gas International Trade	11.9 - 12.8	15.5 - 16.9	17.6 - 19.3
Oil & Gas Domestic Pipeline	0.8 - 1.1	1.5 - 2.1	2.4 - 3.5
Electricity Generation & Transmission	28.8 - 36.0	95.1 - 114.8	150.0 - 182.1