

THAILAND
ENERGY BALANCE TABLES

2002										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production	5.7	4.2	16.4	0.7		9.4				36.4
Net Imports	4.3	31.4	5.6				0.2			41.5
TPED	9.8	35.1	18.8	0.7		9.4	0.2			74.0
Electricity and Heat Generation	-4.9	-0.6	-16.9	-0.7		-0.3	8.3			-14.9
Petroleum Refineries		-3.3								-3.3
Others		-0.1	-0.3							-0.5
TFED	4.9	31.1	1.6			9.2	8.6			55.4
Industry	4.9	10.6	1.6			4.0	3.9			25.0
Transport		18.8								18.8
Residential		1.7				5.2	1.9			8.8
Commercial							2.7			2.7

2010										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production	7.1	8.0	26.6	1.0		11.0				53.7
Net Imports	8.4	43.5	8.5				0.5			61.0
TPED	15.5	51.5	35.1	1.0		11.0	0.5			114.6
Electricity and Heat Generation	-5.8	-0.8	-30.4	-1.0		-0.5	14.5			-23.9
Petroleum Refineries		-3.4								-3.4
Others		-0.3	-0.5							-0.8
TFED	9.7	47.0	4.2			10.6	15.0			86.5
Industry	9.7	17.0	3.9			5.4	7.7			43.7
Transport		28.0	0.3							28.3
Residential		2.0				5.1	2.9			10.0
Commercial							4.5			4.5

2020										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production	5.9	6.1	26.0	0.9		15.5				54.4
Net Imports	27.2	72.7	31.2				1.5			132.6
TPED	33.0	78.8	57.2	0.9		15.5	1.5			187.0
Electricity and Heat Generation	-17.2	-0.4	-48.8	-0.9		-2.0	26.5			-42.9
Petroleum Refineries		-3.7								-3.7
Others		-0.2	-0.5							-0.7
TFED	15.8	74.5	7.9			13.4	28.0			139.7
Industry	15.8	26.1	7.6			8.4	14.8			72.6
Transport		46.0	0.3							46.3
Residential		2.4				5.1	4.9			12.4
Commercial							8.4			8.4

2030										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production	5.9	6.3	16.5	0.8		20.8				50.3
Net Imports	58.8	96.6	48.5				3.6			207.5
TPED	64.6	102.9	65.0	0.8		20.8	3.6			257.8
Electricity and Heat Generation	-43.6	-0.4	-52.9	-0.8		-3.7	39.0			-62.5
Petroleum Refineries		-4.9								-4.9
Others		-0.2	-0.3							-0.5
TFED	21.0	97.4	11.8			17.1	42.6			189.9
Industry	21.0	31.8	11.5			12.1	22.1			98.4
Transport		62.9	0.3							63.2
Residential		2.8				5.0	7.5			15.3
Commercial							13.0			13.0

THAILAND
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)	126	446	681	1 128	1 632	5.9	5.4	5.2	3.8	4.7
Population (million)	47.0	62.8	65.6	69.4	72.2	1.3	0.6	0.6	0.4	0.5
GDP per capita (2000 PPP US\$)	2 681	7 103	10 382	16 249	22 604	4.5	4.9	4.6	3.4	4.2
GDP in Services (2000 PPP US\$ billion)	70	202	309	519	755	5.0	5.4	5.3	3.8	4.8
GDP in Industry (2000 PPP US\$ billion)	41	171	327	564	825	6.8	8.4	5.6	3.9	5.8
Urbanisation level (%)	27	32	34	40	47	0.8	1.0	1.5	1.7	1.4

ENERGY PROJECTIONS

	1980	2002	2010	2020	2030	Growth rate (% per annum)				
						80-02	02-10	10-20	20-30	02-30
	Mtoe									
Production	11.2	36.4	53.7	54.4	50.3	5.5	5.0	0.1	-0.8	1.2
Coal		5.7	7.1	5.9	5.9	12.7	2.8	-1.9		0.1
		(16%)	(13%)	(11%)	(12%)					
Oil		4.2	8.0	6.1	6.3		8.4	-2.7	0.3	1.4
		(12%)	(15%)	(11%)	(12%)					
Gas		16.4	26.6	26.0	16.5		6.2	-0.2	-4.4	
		(45%)	(50%)	(48%)	(33%)					
Hydro		0.7	1.0	0.9	0.8	8.5	5.0	-0.3	-1.2	0.9
		(2%)	(2%)	(2%)	(2%)					
NRE	10.6	9.4	11.0	15.5	20.8	-0.5	2.0	3.5	3.0	2.9
	(95%)	(26%)	(21%)	(28%)	(41%)					
Nuclear										
Net Imports	12.3	41.5	61.0	132.6	207.5	5.7	4.9	8.1	4.6	5.9
Coal	0.1	4.3	8.4	27.2	58.8	21.6	8.7	12.4	8.0	9.8
Oil	12.2	31.4	43.5	72.7	96.6	4.4	4.2	5.3	2.9	4.1
Gas		5.6	8.5	31.2	48.5		5.5	13.8	4.5	8.0
Electricity	0.1	0.2	0.5	1.5	3.6	6.2	9.6	11.8	8.9	10.1
Total Primary Energy Demand	22.8	74.0	114.6	187.0	257.8	5.5	5.6	5.0	3.3	4.6
Coal	0.5	9.8	15.5	33.0	64.6	14.8	5.9	7.9	6.9	7.0
	(2%)	(13%)	(14%)	(18%)	(25%)					
Oil	11.5	35.1	51.5	78.8	102.9	5.2	4.9	4.3	2.7	3.9
	(50%)	(47%)	(45%)	(42%)	(40%)					
Gas		18.8	35.1	57.2	65.0		8.1	5.0	1.3	4.5
		(25%)	(31%)	(31%)	(25%)					
Hydro	0.1	0.7	1.0	0.9	0.8	8.5	5.0	-0.3	-1.2	0.9
	(0%)	(1%)	(1%)	(0%)	(0%)					
NRE	10.6	9.4	11.0	15.5	20.8	-0.5	2.0	3.5	3.0	2.9
	(47%)	(13%)	(10%)	(8%)	(8%)					
Nuclear										
Input for Electricity and Heat Generation	-3.6	-23.3	-38.5	-69.4	-101.5	8.9	6.5	6.1	3.9	5.4
Coal	-0.4	-4.9	-5.8	-17.2	-43.6	12.6	2.2	11.5	9.7	8.1
	(10%)	(21%)	(15%)	(25%)	(43%)					
Oil	-3.1	-0.6	-0.8	-0.4	-0.4	-7.4	4.8	-6.2	-1.1	-1.4
	(87%)	(2%)	(2%)	(1%)	(0%)					
Gas		-16.9	-30.4	-48.8	-52.9		7.6	4.8	0.8	4.2
		(73%)	(79%)	(70%)	(52%)					
Hydro	-0.1	-0.7	-1.0	-0.9	-0.8	8.5	5.0	-0.3	-1.2	0.9
	(3%)	(3%)	(3%)	(1%)	(1%)					
NRE		-0.3	-0.5	-2.0	-3.7		6.4	16.0	6.3	9.7
		(1%)	(1%)	(3%)	(4%)					
Nuclear										
Other Transformation	-0.4	-3.7	-4.2	-4.4	-5.4	10.7	1.4	0.5	2.1	1.3
Coal										
Oil	-0.4	-3.4	-3.6	-3.9	-5.1	10.3	0.8	0.6	2.7	1.4
	(98%)	(91%)	(87%)	(88%)	(94%)					
Gas		-0.3	-0.5	-0.5	-0.3		6.2	-0.2	-4.4	
		(9%)	(13%)	(12%)	(6%)					
NRE										
Electricity										
Heat										

THAILAND

	Mtoe					Growth rate (% per annum)				
	1980	2002	2010	2020	2030	80-02	02-10	10-20	20-30	02-30
Total Final Energy Demand	15.5	55.4	86.5	139.7	189.9	6.0	5.7	4.9	3.1	4.5
Coal	0.1 (1%)	4.9 (9%)	9.7 (11%)	15.8 (11%)	21.0 (11%)	19.7	8.8	5.0	2.9	5.3
Oil	7.6 (49%)	31.1 (56%)	47.0 (54%)	74.5 (53%)	97.4 (51%)	6.6	5.3	4.7	2.7	4.2
Gas		1.6 (3%)	4.2 (5%)	7.9 (6%)	11.8 (6%)		12.8	6.5	4.1	7.4
NRE	6.7 (43%)	9.2 (17%)	10.6 (12%)	13.4 (10%)	17.1 (9%)	1.4	1.8	2.5	2.4	2.3
Electricity	1.1 (7%)	8.6 (15%)	15.0 (17%)	28.0 (20%)	42.6 (22%)	9.7	7.3	6.4	4.3	5.9
Heat										
Industry	5.1	25.0	43.7	72.6	98.4	7.5	7.2	5.2	3.1	5.0
Coal	0.1 (2%)	4.9 (20%)	9.7 (22%)	15.8 (22%)	21.0 (21%)	19.7	8.8	5.0	2.9	5.3
Oil	3.2 (62%)	10.6 (42%)	17.0 (39%)	26.1 (36%)	31.8 (32%)	5.6	6.2	4.3	2.0	4.0
Gas		1.6 (6%)	3.9 (9%)	7.6 (10%)	11.5 (12%)		11.7	6.9	4.2	7.3
NRE	1.3 (26%)	4.0 (16%)	5.4 (12%)	8.4 (12%)	12.1 (12%)	5.2	3.9	4.5	3.7	4.1
Electricity	0.5 (11%)	3.9 (16%)	7.7 (18%)	14.8 (20%)	22.1 (22%)	9.4	8.7	6.8	4.1	6.3
Heat										
Transport	4.0	18.8	28.3	46.3	63.2	7.3	5.3	5.1	3.2	4.4
Coal										
Oil	4.0 (100%)	18.8 (100%)	28.0 (99%)	46.0 (99%)	62.9 (99%)	7.3	5.1	5.1	3.2	4.4
Gas		0.01 (0%)	0.33 (1%)	0.33 (1%)	0.33 (1%)		68.6			16.1
NRE										
Electricity										
Residential	6.0	8.8	10.0	12.4	15.3	1.8	1.6	2.1	2.2	2.0
Coal										
Oil	0.4 (6%)	1.7 (20%)	2.0 (20%)	2.4 (20%)	2.8 (18%)	7.5	1.9	1.8	1.2	1.7
Gas										
NRE	5.4 (90%)	5.2 (59%)	5.1 (51%)	5.1 (41%)	5.0 (33%)	-0.2	-0.1	-0.1	-0.1	-0.1
Electricity	0.3 (4%)	1.9 (22%)	2.9 (29%)	4.9 (39%)	7.5 (49%)	9.5	5.3	5.4	4.5	5.0
Heat										
Commercial	0.4	2.7	4.5	8.4	13.0	9.5	6.4	6.5	4.5	5.7
Coal										
Oil	0.1 (16%)									
Gas										
NRE										
Electricity	0.3 (84%)	2.7 (100%)	4.5 (100%)	8.4 (100%)	13.0 (100%)	10.4	6.4	6.5	4.5	5.7
Heat										

ENERGY SECURITY

	1980	2002	2010	2020	2030
Diversity of Primary Energy Demand (Rated between 1 and 100)	56	78	78	80	83
Net Energy Import Ratio (%)	52	53	53	71	80
Net Oil Import Dependency (%)	100	89	84	92	94

THAILAND
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)	14	111	192	347	504	9.7	7.1	6.1	3.8	5.5
Coal	1 (10%)	18 (16%)	23 (12%)	71 (21%)	190 (38%)	12.3	2.8	12.1	10.3	8.7
Oil	12 (81%)	2 (2%)	4 (2%)	2 (1%)	2	-6.9	5.3	-5.8	-0.7	-0.9
Gas		82 (74%)	153 (80%)	256 (74%)	289 (57%)		8.1	5.3	1.2	4.6
Hydro	1 (9%)	8 (7%)	11 (6%)	11 (3%)	10 (2%)	8.5	5.0	-0.3	-1.2	0.9
NRE		1 (1%)	1 (1%)	7 (2%)	13 (3%)		7.2	16.8	7.0	10.4
Nuclear										
Total Installed Generation Capacity (GW)	4	23	33	59	91	8.4	4.7	6.0	4.4	5.0
Thermal	2 (56%)	20 (87%)	29 (88%)	54 (91%)	84 (92%)	10.5	5.0	6.3	4.5	5.3
Coal		3 (12%)	4 (12%)	11 (18%)	26 (28%)		5.1	9.9	9.2	8.3
Oil		0.37 (2%)	0.59 (2%)	0.35 (1%)	0.35		5.9	-5.2		-0.3
Gas		17 (73%)	25 (74%)	43 (72%)	58 (64%)		4.9	5.7	3.0	4.5
Hydro	1 (33%)	3 (13%)	3 (10%)	4 (6%)	4 (4%)	3.7	2.2	0.7		0.9
NRE	0.4 (10%)	0.2 (1%)	0.4 (1%)	1.7 (3%)	3.3 (4%)	-3.7	11.7	15.1	6.7	11.1
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)	181	166	168	166	158	-0.4	0.2	-0.1	-0.5	-0.2
Industry (toe per US\$ million GDP in Industry)	126	146	134	129	119	0.7	-1.1	-0.4	-0.8	-0.7
Commercial (toe per US\$ million GDP in Services)	5	13	15	16	17	4.3	0.9	1.1	0.6	0.9
Energy Intensity (kgoe per capita)	486	1 179	1 746	2 693	3 571	4.1	5.0	4.4	2.9	4.0
Industry	109	398	666	1 046	1 364	6.1	6.6	4.6	2.7	4.5
Transport	85	299	431	668	876	5.9	4.7	4.5	2.7	3.9
Residential	128	141	153	178	212	0.4	1.1	1.5	1.8	1.5
Commercial	8	43	68	121	180	8.1	5.8	5.9	4.1	5.2
CO₂ Emissions (million tonnes)	35.7	192.6	306.7	516.7	733.6	8.0	6.0	5.4	3.6	4.9
Electricity Generation	11.4	60.1	96.1	182.1	294.0	7.8	6.0	6.6	4.9	5.8
Transformation other than Electricity Generation	1.0	15.8	21.3	29.9	36.6	13.5	3.8	3.4	2.0	3.0
Industry	10.2	55.0	98.4	158.2	204.9	7.9	7.5	4.9	2.6	4.8
Transport	11.9	56.4	84.7	139.1	189.7	7.3	5.2	5.1	3.2	4.4
Residential	1.0	5.3	6.2	7.4	8.4	7.9	2.0	1.8	1.3	1.7
Commercial										
CO₂ Emissions Intensity										
CO ₂ emissions per GDP (tonnes per US\$ million)	283.5	431.7	450.1	458.1	449.6	1.9	0.5	0.2	-0.2	0.1
CO ₂ emissions per capita (tonnes per capita)	0.8	3.1	4.7	7.4	10.2	6.5	5.4	4.8	3.2	4.4

ENERGY INVESTMENT REQUIREMENTS

(Cumulative from 2003 -)	2010	2020	2030
Total (2000 US\$ billion)	30.9 - 41.2	97.2 - 124.5	168.0 - 211.4
Coal Production & Transportation	0.2 - 0.3	0.4 - 0.5	0.5 - 0.7
Oil & Gas Production & Processing	11.4 - 16.7	24.7 - 35.7	34.7 - 50.2
Oil & Gas International Trade	1.8 - 2.0	13.9 - 15.8	23.6 - 26.8
Oil & Gas Domestic Pipeline	1.8 - 2.5	4.2 - 6.0	5.2 - 7.5
Electricity Generation & Transmission	15.7 - 19.6	54.0 - 66.4	104.0 - 126.3