

**THAILAND**  
**ENERGY BALANCE TABLES**

<b>2002</b>										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
<b>TPED</b>	<b>9.8</b>	<b>35.1</b>	<b>18.8</b>	<b>0.7</b>		<b>9.4</b>	<b>0.2</b>			<b>74.0</b>
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
<b>TFED</b>	<b>4.9</b>	<b>31.1</b>	<b>1.6</b>			<b>9.2</b>	<b>8.6</b>			<b>55.4</b>
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

  

<b>2010</b>										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
<b>TPED</b>	<b>15.5</b>	<b>51.5</b>	<b>35.1</b>	<b>1.0</b>		<b>11.0</b>	<b>0.5</b>			<b>114.6</b>
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
<b>TFED</b>	<b>9.7</b>	<b>47.0</b>	<b>4.2</b>			<b>10.6</b>	<b>15.0</b>			<b>86.5</b>
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

  

<b>2020</b>										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
<b>TPED</b>	<b>33.0</b>	<b>78.8</b>	<b>57.2</b>	<b>0.9</b>		<b>15.5</b>	<b>1.5</b>			<b>187.0</b>
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
<b>TFED</b>	<b>15.8</b>	<b>74.5</b>	<b>7.9</b>			<b>13.4</b>	<b>28.0</b>			<b>139.7</b>
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

  

<b>2030</b>										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
<b>TPED</b>	<b>64.6</b>	<b>102.9</b>	<b>65.0</b>	<b>0.8</b>		<b>20.8</b>	<b>3.6</b>			<b>257.8</b>
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
<b>TFED</b>	<b>21.0</b>	<b>97.4</b>	<b>11.8</b>			<b>17.1</b>	<b>42.6</b>			<b>189.9</b>
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
<b>GDP</b> (2000 PPP US\$ billion)	126	446	681	1 128	1 632	5.9	5.4	5.2	3.8	4.7
<b>Population</b> (million)	47.0	62.8	65.6	69.4	72.2	1.3	0.6	0.6	0.4	0.5
<b>GDP per capita</b> (2000 PPP US\$)	2 681	7 103	10 382	16 249	22 604	4.5	4.9	4.6	3.4	4.2
<b>GDP in Services</b> (2000 PPP US\$ billion)	70	202	309	519	755	5.0	5.4	5.3	3.8	4.8
<b>GDP in Industry</b> (2000 PPP US\$ billion)	41	171	327	564	825	6.8	8.4	5.6	3.9	5.8
<b>Urbanisation level</b> (%)	27	32	34	40	47	0.8	1.0	1.5	1.7	1.4

**ENERGY PROJECTIONS**

	1980	2002	Mtoe			2030	Growth rate (% per annum)				
			2010	2020	2030		80-02	02-10	10-20	20-30	02-30
<b>Production</b>	<b>11.2</b>	<b>36.4</b>	<b>53.7</b>	<b>54.4</b>	<b>50.3</b>	<b>5.5</b>	<b>5.0</b>	<b>0.1</b>	<b>-0.8</b>	<b>1.2</b>	
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											
<b>Net Imports</b>	<b>12.3</b>	<b>41.5</b>	<b>61.0</b>	<b>132.6</b>	<b>207.5</b>	<b>5.7</b>	<b>4.9</b>	<b>8.1</b>	<b>4.6</b>	<b>5.9</b>	
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	
<b>Total Primary Energy Demand</b>	<b>22.8</b>	<b>74.0</b>	<b>114.6</b>	<b>187.0</b>	<b>257.8</b>	<b>5.5</b>	<b>5.6</b>	<b>5.0</b>	<b>3.3</b>	<b>4.6</b>	
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											
<b>Input for Electricity and Heat Generation</b>	<b>-3.6</b>	<b>-23.3</b>	<b>-38.5</b>	<b>-69.4</b>	<b>-101.5</b>	<b>8.9</b>	<b>6.5</b>	<b>6.1</b>	<b>3.9</b>	<b>5.4</b>	
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											
<b>Other Transformation</b>	<b>-0.4</b>	<b>-3.7</b>	<b>-4.2</b>	<b>-4.4</b>	<b>-5.4</b>	<b>10.7</b>	<b>1.4</b>	<b>0.5</b>	<b>2.1</b>	<b>1.3</b>	
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
<b>Total Final Energy Demand</b>	<b>15.5</b>	<b>55.4</b>	<b>86.5</b>	<b>139.7</b>	<b>189.9</b>	<b>6.0</b>	<b>5.7</b>	<b>4.9</b>	<b>3.1</b>	<b>4.5</b>
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										
<b>Industry</b>	<b>5.1</b>	<b>25.0</b>	<b>43.7</b>	<b>72.6</b>	<b>98.4</b>	<b>7.5</b>	<b>7.2</b>	<b>5.2</b>	<b>3.1</b>	<b>5.0</b>
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										
<b>Transport</b>	<b>4.0</b>	<b>18.8</b>	<b>28.3</b>	<b>46.3</b>	<b>63.2</b>	<b>7.3</b>	<b>5.3</b>	<b>5.1</b>	<b>3.2</b>	<b>4.4</b>
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										
<b>Residential</b>	<b>6.0</b>	<b>8.8</b>	<b>10.0</b>	<b>12.4</b>	<b>15.3</b>	<b>1.8</b>	<b>1.6</b>	<b>2.1</b>	<b>2.2</b>	<b>2.0</b>
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										
<b>Commercial</b>	<b>0.4</b>	<b>2.7</b>	<b>4.5</b>	<b>8.4</b>	<b>13.0</b>	<b>9.5</b>	<b>6.4</b>	<b>6.5</b>	<b>4.5</b>	<b>5.7</b>
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
<b>Total Electricity Generation (TWh)</b>	<b>14</b>	<b>111</b>	<b>192</b>	<b>347</b>	<b>504</b>	<b>9.7</b>	<b>7.1</b>	<b>6.1</b>	<b>3.8</b>	<b>5.5</b>
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										
<b>Total Installed Generation Capacity (GW)</b>	<b>4</b>	<b>23</b>	<b>33</b>	<b>59</b>	<b>91</b>	<b>8.4</b>	<b>4.7</b>	<b>6.0</b>	<b>4.4</b>	<b>5.0</b>
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 & CO<sub>2</sub> EMISSIONS**

	1980	2002	2010	2020	2030	Growth Rates (% per annum)				
						80-02	02-10	10-20	20-30	02-30
<b>Energy Intensity (toe per US\$ million GDP)</b>	<b>181</b>	<b>166</b>	<b>168</b>	<b>166</b>	<b>158</b>	<b>-0.4</b>	<b>0.2</b>	<b>-0.1</b>	<b>-0.5</b>	<b>-0.2</b>
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
<b>Energy Intensity (kgoe per capita)</b>	<b>486</b>	<b>1 179</b>	<b>1 746</b>	<b>2 693</b>	<b>3 571</b>	<b>4.1</b>	<b>5.0</b>	<b>4.4</b>	<b>2.9</b>	<b>4.0</b>
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
<b>CO<sub>2</sub> Emissions (million tonnes)</b>	<b>35.7</b>	<b>192.6</b>	<b>306.7</b>	<b>516.7</b>	<b>733.6</b>	<b>8.0</b>	<b>6.0</b>	<b>5.4</b>	<b>3.6</b>	<b>4.9</b>
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										
<b>CO<sub>2</sub> Emissions Intensity</b>										
CO <sub>2</sub> 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 <sub>2</sub> 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
<b>Total (2000 US\$ billion)</b>	<b>30.9 - 41.2</b>	<b>97.2 - 124.5</b>	<b>168.0 - 211.4</b>
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