

AUSTRALIA  
ENERGY BALANCE TABLES

2002									Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total
Production	174.7	33.0	27.0	1.4		5.0			241.2
Net Imports	- 131.6	8.6	- 8.9						- 131.8
<b>TPED</b>	<b>46.9</b>	<b>41.2</b>	<b>18.2</b>	<b>1.4</b>		<b>5.0</b>			<b>112.7</b>
Electricity and Heat Generation	- 44.2	- 1.0	- 7.0	- 1.4		- 0.6	17.1		- 36.9
Petroleum Refineries		- 1.9	- 0.2				- 0.1		- 2.3
Others		- 0.5					- 0.4		- 0.9
<b>TFED</b>	<b>2.8</b>	<b>33.8</b>	<b>10.9</b>			<b>4.5</b>	<b>16.3</b>		<b>68.3</b>
Industry	2.6	5.4	7.1			2.5	7.6		25.2
Transport	0.1	27.7					0.2		27.9
Residential		0.3	2.7			2.0	4.4		9.5
Commercial	0.1	0.3	1.1				4.2		5.7

  

2010									Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total
Production	252.2	26.9	51.1	1.4		7.3			338.9
Net Imports	- 202.0	16.2	- 23.6						- 209.4
<b>TPED</b>	<b>50.2</b>	<b>43.1</b>	<b>27.5</b>	<b>1.4</b>		<b>7.3</b>			<b>129.5</b>
Electricity and Heat Generation	- 46.9	- 0.8	- 12.7	- 1.4		- 2.3	20.8		- 43.3
Petroleum Refineries		- 2.1	- 0.2				- 0.1		- 2.5
Others		- 0.8					- 0.6		- 1.4
<b>TFED</b>	<b>3.4</b>	<b>39.3</b>	<b>14.6</b>			<b>5.0</b>	<b>20.1</b>		<b>82.3</b>
Industry	3.3	6.0	9.8			2.9	9.5		31.4
Transport		32.6					0.2		32.9
Residential		0.4	3.3			2.1	5.1		10.7
Commercial		0.4	1.4				5.4		7.2

  

2020									Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total
Production	310.9	24.9	90.1	1.5		9.1			436.4
Net Imports	- 253.0	26.0	- 55.8						- 282.9
<b>TPED</b>	<b>57.9</b>	<b>50.9</b>	<b>34.2</b>	<b>1.5</b>		<b>9.1</b>			<b>153.5</b>
Electricity and Heat Generation	- 54.4	- 0.8	- 15.5	- 1.5		- 3.6	26.0		- 49.8
Petroleum Refineries		- 2.4	- 0.3				- 0.2		- 2.8
Others		- 1.0					- 0.7		- 1.7
<b>TFED</b>	<b>3.5</b>	<b>46.6</b>	<b>18.5</b>			<b>5.5</b>	<b>25.2</b>		<b>99.2</b>
Industry	3.4	7.0	12.7			3.4	12.0		38.5
Transport		38.8					0.2		39.1
Residential		0.4	3.9			2.1	5.9		12.3
Commercial		0.5	1.8				7.0		9.3

  

2030									Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total
Production	367.6	24.8	115.5	1.5		10.4			519.8
Net Imports	- 301.4	34.6	- 75.5						- 342.2
<b>TPED</b>	<b>66.2</b>	<b>59.4</b>	<b>40.1</b>	<b>1.5</b>		<b>10.4</b>			<b>177.6</b>
Electricity and Heat Generation	- 62.6	- 0.8	- 17.7	- 1.5		- 4.5	31.5		- 55.7
Petroleum Refineries		- 2.7	- 0.3				- 0.2		- 3.1
Others		- 1.1					- 0.8		- 2.0
<b>TFED</b>	<b>3.6</b>	<b>54.8</b>	<b>22.1</b>			<b>5.9</b>	<b>30.5</b>		<b>116.8</b>
Industry	3.5	8.2	15.3			3.8	14.5		45.2
Transport		45.6	0.1				0.2		45.9
Residential		0.4	4.5			2.1	7.0		14.1
Commercial		0.5	2.2				8.7		11.5

## AUSTRALIA

## 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)	261	536	672	846	1 048	3.3	2.9	2.3	2.2	2.4
<b>Population</b> (million)	14.8	19.8	21.3	23.2	25.0	1.3	1.0	0.8	0.8	0.8
<b>GDP per capita</b> (2000 PPP US\$)	17 593	27 112	31 539	36 503	41 864	2.0	1.9	1.5	1.4	1.6
<b>GDP in Services</b> (2000 PPP US\$ billion)	157	352	459	605	772	3.7	3.4	2.8	2.5	2.8
<b>GDP in Industry</b> (2000 PPP US\$ billion)	73	138	169	220	276	2.9	2.5	2.7	2.3	2.5
<b>Urbanisation level</b> (%)	86	91	94	95	96	0.3	0.3	0.1	0.1	0.2

## ENERGY PROJECTIONS

	Mtoe					Growth rate (% per annum)				
	1980	2002	2010	2020	2030	80-02	02-10	10-20	20-30	02-30
<b>Production</b>	<b>86.1</b>	<b>241.2</b>	<b>338.9</b>	<b>436.4</b>	<b>519.8</b>	<b>4.8</b>	<b>4.3</b>	<b>2.6</b>	<b>1.8</b>	<b>2.8</b>
Coal	52.6 (61%)	174.7 (72%)	252.2 (74%)	310.9 (71%)	367.6 (71%)	5.6	4.7	2.1	1.7	2.7
Oil	21.3 (25%)	33.0 (14%)	26.9 (8%)	24.9 (6%)	24.8 (5%)	2.0	-2.5	-0.8	-0.05	-1.0
Gas	7.5 (9%)	27.0 (11%)	51.1 (15%)	90.1 (21%)	115.5 (22%)	6.0	8.3	5.8	2.5	5.3
Hydro	1.1 (1%)	1.4 (1%)	1.4 (0%)	1.5 (0%)	1.5 (0%)	1.0	0.4	0.2	0.5	0.4
NRE	3.6 (4%)	5.0 (2%)	7.3 (2%)	9.1 (2%)	10.4 (2%)	1.5	4.7	2.3	1.4	2.6
Nuclear										
<b>Net Imports</b>	<b>- 17.3</b>	<b>- 131.8</b>	<b>- 209.4</b>	<b>- 282.9</b>	<b>- 342.2</b>	<b>9.7</b>	<b>6.0</b>	<b>3.1</b>	<b>1.9</b>	<b>3.5</b>
Coal	- 28.5	- 131.6	- 202.0	- 253.0	- 301.4	7.2	5.5	2.3	1.8	3.0
Oil	11.2	8.6	16.2	26.0	34.6	- 1.2	8.2	4.9	2.9	5.1
Gas		- 8.9	- 23.6	- 55.8	- 75.5		13.0	9.0	3.1	7.9
Electricity										
<b>Total Primary Energy Demand</b>	<b>70.4</b>	<b>112.7</b>	<b>129.5</b>	<b>153.5</b>	<b>177.6</b>	<b>2.2</b>	<b>1.8</b>	<b>1.7</b>	<b>1.5</b>	<b>1.6</b>
Coal	27.3 (39%)	46.9 (42%)	50.2 (39%)	57.9 (38%)	66.2 (37%)	2.5	0.9	1.4	1.3	1.2
Oil	30.8 (44%)	41.2 (37%)	43.1 (33%)	50.9 (33%)	59.4 (33%)	1.3	0.6	1.7	1.6	1.3
Gas	7.5 (11%)	18.2 (16%)	27.5 (21%)	34.2 (22%)	40.1 (23%)	4.1	5.3	2.2	1.6	2.9
Hydro	1.1 (2%)	1.4 (1%)	1.4 (1%)	1.5 (1%)	1.5 (1%)	1.0	0.4	0.2	0.5	0.4
NRE	3.6 (5%)	5.0 (4%)	7.3 (6%)	9.1 (6%)	10.4 (6%)	1.5	4.7	2.3	1.4	2.6
Nuclear										
<b>Input for Electricity and Heat Generation</b>	<b>- 24.0</b>	<b>- 54.1</b>	<b>- 64.1</b>	<b>- 75.8</b>	<b>- 87.1</b>	<b>3.8</b>	<b>2.1</b>	<b>1.7</b>	<b>1.4</b>	<b>1.7</b>
Coal	- 20.2 (84%)	- 44.2 (82%)	- 46.9 (73%)	- 54.4 (72%)	- 62.6 (72%)	3.6	0.7	1.5	1.4	1.3
Oil	- 1.1 (5%)	- 1.0 (2%)	- 0.8 (1%)	- 0.8 (1%)	- 0.8 (1%)	- 0.7	- 2.1	0.3	- 0.2	- 0.6
Gas	- 1.5 (6%)	- 7.0 (13%)	- 12.7 (20%)	- 15.5 (20%)	- 17.7 (20%)	7.2	7.7	2.0	1.3	3.4
Hydro	- 1.1 (5%)	- 1.4 (3%)	- 1.4 (2%)	- 1.5 (2%)	- 1.5 (2%)	1.0	0.4	0.2	0.5	0.4
NRE	- 0.1 (0%)	- 0.6 (1%)	- 2.3 (4%)	- 3.6 (5%)	- 4.5 (5%)	7.7	19.2	4.7	2.2	7.7
Nuclear										
<b>Other Transformation</b>	<b>- 4.3</b>	<b>- 3.2</b>	<b>- 3.9</b>	<b>- 4.5</b>	<b>- 5.1</b>	<b>- 1.3</b>	<b>2.4</b>	<b>1.5</b>	<b>1.3</b>	<b>1.7</b>
Coal	- 0.5 (11%)									
Oil	- 2.7 (63%)	- 2.5 (77%)	- 2.9 (75%)	- 3.4 (75%)	- 3.8 (74%)	- 0.4	2.1	1.4	1.2	1.6
Gas	- 0.7 (16%)	- 0.2 (7%)	- 0.2 (6%)	- 0.3 (6%)	- 0.3 (6%)	- 5.1	1.3	1.2	1.1	1.2
NRE										
Electricity	- 0.3 (7%)	- 0.5 (16%)	- 0.7 (19%)	- 0.9 (19%)	- 1.0 (20%)	3.0	3.9	1.9	1.6	2.4
Heat	- 0.1 (3%)									

## AUSTRALIA

	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>45.5</b>	<b>68.3</b>	<b>82.3</b>	<b>99.2</b>	<b>116.8</b>	<b>1.9</b>	<b>2.4</b>	<b>1.9</b>	<b>1.6</b>	<b>1.9</b>
Coal	4.2 (9%)	2.8 (4%)	3.4 (4%)	3.5 (4%)	3.6 (3%)	-1.9	2.4	0.4	0.2	0.9
Oil	25.6 (56%)	33.8 (49%)	39.3 (48%)	46.6 (47%)	54.8 (47%)	1.3	1.9	1.7	1.6	1.7
Gas	5.3 (12%)	10.9 (16%)	14.6 (18%)	18.5 (19%)	22.1 (19%)	3.3	3.6	2.4	1.8	2.5
NRE	3.5 (8%)	4.5 (7%)	5.0 (6%)	5.5 (6%)	5.9 (5%)	1.1	1.3	0.9	0.8	1.0
Electricity	6.8 (15%)	16.3 (24%)	20.1 (24%)	25.2 (25%)	30.5 (26%)	4.1	2.6	2.3	1.9	2.2
Heat										
<b>Industry</b>	<b>19.3</b>	<b>25.2</b>	<b>31.4</b>	<b>38.5</b>	<b>45.2</b>	<b>1.2</b>	<b>2.8</b>	<b>2.1</b>	<b>1.6</b>	<b>2.1</b>
Coal	4.0 (21%)	2.6 (10%)	3.3 (10%)	3.4 (9%)	3.5 (8%)	-1.8	2.7	0.5	0.2	1.0
Oil	6.7 (35%)	5.4 (22%)	6.0 (19%)	7.0 (18%)	8.2 (18%)	-0.9	1.2	1.6	1.6	1.5
Gas	3.8 (20%)	7.1 (28%)	9.8 (31%)	12.7 (33%)	15.3 (34%)	2.8	4.2	2.6	1.9	2.8
NRE	1.9 (10%)	2.5 (10%)	2.9 (9%)	3.4 (9%)	3.8 (8%)	1.2	2.2	1.5	1.2	1.6
Electricity	2.9 (15%)	7.6 (30%)	9.5 (30%)	12.0 (31%)	14.5 (32%)	4.4	2.8	2.4	1.9	2.3
Heat										
<b>Transport</b>	<b>17.7</b>	<b>27.9</b>	<b>32.9</b>	<b>39.1</b>	<b>45.9</b>	<b>2.1</b>	<b>2.1</b>	<b>1.7</b>	<b>1.6</b>	<b>1.8</b>
Coal		0.1 (0%)	0.1 (0%)	0.1 (0%)	0.1 (0%)		-1.8			-0.5
Oil	17.6 (100%)	27.7 (99%)	32.6 (99%)	38.8 (99%)	45.6 (99%)	2.1	2.1	1.7	1.6	1.8
Gas		0.02 (0%)	0.03 (0%)	0.1 (0%)	0.1 (0%)		5.8	4.2	1.8	3.8
NRE										
Electricity	0.1 (0%)	0.2 (1%)	0.2 (1%)	0.2 (1%)	0.2 (1%)	3.8	2.4	0.5	0.9	1.2
<b>Residential</b>	<b>6.1</b>	<b>9.5</b>	<b>10.7</b>	<b>12.3</b>	<b>14.1</b>	<b>2.0</b>	<b>1.6</b>	<b>1.4</b>	<b>1.3</b>	<b>1.4</b>
Coal	0.1 (1%)					-11.6				
Oil	0.8 (13%)	0.3 (4%)	0.4 (3%)	0.4 (3%)	0.4 (3%)	-3.8	0.6	0.7	0.8	0.7
Gas	1.1 (18%)	2.7 (29%)	3.3 (30%)	3.9 (32%)	4.5 (32%)	4.2	2.4	1.8	1.5	1.9
NRE	1.6 (26%)	2.0 (21%)	2.1 (19%)	2.1 (17%)	2.1 (15%)	1.0	0.3	0.2	0.2	0.2
Electricity	2.5 (41%)	4.4 (47%)	5.1 (47%)	5.9 (48%)	7.0 (50%)	2.6	1.7	1.6	1.7	1.7
Heat										
<b>Commercial</b>	<b>2.4</b>	<b>5.7</b>	<b>7.2</b>	<b>9.3</b>	<b>11.5</b>	<b>4.0</b>	<b>3.0</b>	<b>2.5</b>	<b>2.2</b>	<b>2.5</b>
Coal	0.2 (6%)	0.1 (1%)	0.04 (0%)	0.03 (0%)	0.02 (0%)	-3.8	-4.9	-3.4	-2.5	-3.5
Oil	0.5 (21%)	0.3 (6%)	0.4 (5%)	0.5 (5%)	0.5 (5%)	-2.1	2.2	1.8	1.7	1.9
Gas	0.4 (16%)	1.1 (20%)	1.4 (20%)	1.8 (20%)	2.2 (19%)	5.0	3.0	2.4	2.0	2.4
NRE										
Electricity	1.3 (55%)	4.2 (73%)	5.4 (74%)	7.0 (75%)	8.7 (76%)	5.3	3.2	2.6	2.3	2.7
Heat										

## ENERGY SECURITY

	1980	2002	2010	2020	2030
Diversity of Primary Energy Demand (Rated between 1 and 100)	73	76	80	81	81
Net Energy Import Ratio (%)	-25	-121	-162	-184	-193
Net Oil Import Dependency (%)	36	21	38	51	58

**AUSTRALIA**  
**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>95</b>	<b>219</b>	<b>267</b>	<b>330</b>	<b>398</b>	<b>3.9</b>	<b>2.5</b>	<b>2.1</b>	<b>1.9</b>	<b>2.2</b>
Coal	70 (73%)	172 (79%)	188 (70%)	226 (68%)	270 (68%)	4.2	1.1	1.9	1.8	1.6
Oil	5 (5%)	4 (2%)	3 (1%)	3 (1%)	3 (1%)	-1.4	-2.0	0.5	-0.1	-0.4
Gas	7 (7%)	26 (12%)	52 (20%)	73 (22%)	93 (23%)	6.1	9.3	3.3	2.5	4.7
Hydro	13 (14%)	16 (7%)	17 (6%)	17 (5%)	18 (4%)	1.0	0.4	0.2	0.5	0.4
NRE		1 (1%)	7 (3%)	11 (3%)	14 (4%)		23.9	5.1	2.5	9.2
Nuclear										
<b>Total Installed Generation Capacity (GW)</b>	<b>24</b>	<b>49</b>	<b>60</b>	<b>81</b>	<b>94</b>	<b>3.2</b>	<b>2.8</b>	<b>2.9</b>	<b>1.6</b>	<b>2.4</b>
Thermal	18 (75%)	40 (82%)	48 (79%)	65 (80%)	77 (81%)	3.7	2.2	3.2	1.7	2.4
Coal	14 (58%)	28 (57%)	30 (50%)	40 (49%)	47 (50%)	3.2	1.0	2.8	1.6	1.9
Oil	4 (17%)	2 (3%)	2 (3%)	2 (2%)	2 (2%)	-4.2		2.2	0.6	1.0
Gas		11 (22%)	16 (26%)	23 (29%)	28 (30%)	21.1	4.9	3.8	1.9	3.4
Hydro	6 (25%)	8 (16%)	10 (16%)	10 (13%)	10 (11%)	1.0	3.2	0.4	0.2	1.1
NRE		1 (2%)	3 (5%)	6 (7%)	7 (8%)		15.8	6.1	2.4	7.4
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>270</b>	<b>210</b>	<b>193</b>	<b>181</b>	<b>170</b>	<b>-1.1</b>	<b>-1.1</b>	<b>-0.6</b>	<b>-0.7</b>	<b>-0.8</b>
Industry (toe per US\$ million GDP in Industry)	263	182	186	175	164	-1.7	0.3	-0.6	-0.7	-0.4
Commercial (toe per US\$ million GDP in Services)	15	16	16	15	15	0.3	-0.3	-0.3	-0.3	-0.3
<b>Energy Intensity (kgoe per capita)</b>	<b>4 752</b>	<b>5 703</b>	<b>6 077</b>	<b>6 623</b>	<b>7 097</b>	<b>0.8</b>	<b>0.8</b>	<b>0.9</b>	<b>0.7</b>	<b>0.8</b>
Industry	1 306	1 275	1 476	1 662	1 808	-0.1	1.8	1.2	0.8	1.3
Transport	1 196	1 414	1 544	1 687	1 836	0.8	1.1	0.9	0.8	0.9
Residential	409	479	504	531	562	0.7	0.6	0.5	0.6	0.6
Commercial	162	289	340	401	461	2.7	2.1	1.6	1.4	1.7
<b>CO<sub>2</sub> Emissions (million tonnes)</b>	<b>203.1</b>	<b>340.4</b>	<b>396.8</b>	<b>472.9</b>	<b>549.0</b>	<b>2.4</b>	<b>1.9</b>	<b>1.8</b>	<b>1.5</b>	<b>1.7</b>
Electricity Generation	82.6	190.6	214.0	249.8	286.8	3.9	1.5	1.6	1.4	1.5
Transformation other than Electricity Generation	13.1	13.3	19.1	27.8	34.1	0.1	4.6	3.8	2.1	3.4
Industry	47.5	43.3	53.7	64.2	74.2	-0.4	2.7	1.8	1.5	1.9
Transport	51.7	81.9	96.6	115.0	135.2	2.1	2.1	1.8	1.6	1.8
Residential	5.1	7.4	8.7	10.3	11.8	1.7	2.0	1.7	1.4	1.7
Commercial	3.0	3.9	4.7	5.8	6.9	1.2	2.4	2.1	1.8	2.1
<b>CO<sub>2</sub> Emissions Intensity</b>										
CO <sub>2</sub> emissions per GDP (tonnes per US\$ million)	779.5	635.5	590.4	558.9	524.1	-0.9	-0.9	-0.5	-0.6	-0.7
CO <sub>2</sub> emissions per capita (tonnes per capita)	13.7	17.2	18.6	20.4	21.9	1.0	1.0	0.9	0.7	0.9

**ENERGY INVESTMENT REQUIREMENTS**

(Cumulative from 2003 - )	2010	2020	2030
<b>Total (2000 US\$ billion)</b>	<b>59.7 - 75.4</b>	<b>137.3 - 169.9</b>	<b>200.4 - 247.8</b>
Coal Production & Transportation	12.7 - 15.0	25.9 - 30.0	40.3 - 46.1
Oil & Gas Production & Processing	9.3 - 13.0	17.6 - 24.8	24.7 - 35.1
Oil & Gas International Trade	5.4 - 5.9	17.7 - 19.5	23.1 - 25.6
Oil & Gas Domestic Pipeline	9.4 - 13.4	16.6 - 23.7	22.9 - 32.7
Electricity Generation & Transmission	23.0 - 28.0	59.6 - 71.8	89.3 - 108.3