

OCEANIA
ENERGY BALANCE TABLES

2002	Mtoe								
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total
Production	177.5	36.9	32.6	3.3		8.8			259.0
Net Imports	- 133.3	12.5	- 8.9						- 129.6
TPED	48.1	48.9	23.7	3.3		8.8			132.8
Electricity and Heat Generation	- 44.5	- 1.3	- 9.1	- 3.3		- 3.2	20.4		- 41.0
Petroleum Refineries		- 2.5	- 0.2				- 0.1		- 2.9
Others		- 0.5	- 0.1				- 0.4		- 1.1
TFED	3.7	40.7	13.9			5.5	19.5		83.3
Industry	3.4	6.5	9.6			3.3	9.1		31.8
Transport	0.1	33.4					0.2		33.6
Residential		0.4	2.9			2.2	5.5		11.0
Commercial	0.2	0.4	1.4				4.8		6.8

2010	Mtoe								
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total
Production	255.2	30.4	54.7	3.9		12.6			356.8
Net Imports	- 202.6	21.9	- 25.2						- 205.9
TPED	52.6	52.3	29.5	3.9		12.6			150.9
Electricity and Heat Generation	- 48.3	- 1.1	- 13.4	- 3.9		- 6.2	24.8		- 48.2
Petroleum Refineries		- 2.9	- 0.2				- 0.2		- 3.3
Others		- 0.8	- 0.1			- 0.1	- 0.6		- 1.5
TFED	4.3	47.5	15.8			6.3	24.1		98.0
Industry	4.1	7.3	10.6			4.0	11.4		37.4
Transport		39.2					0.2		39.5
Residential		0.5	3.5			2.3	6.3		12.6
Commercial	0.1	0.5	1.8				6.1		8.4

2020	Mtoe								
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total
Production	314.2	28.1	98.3	4.1		17.5			462.1
Net Imports	- 253.9	34.0	- 61.4						- 281.2
TPED	60.4	62.1	36.9	4.1		17.5			180.9
Electricity and Heat Generation	- 55.9	- 1.3	- 16.6	- 4.1		- 10.5	30.9		- 57.5
Petroleum Refineries		- 3.1	- 0.3				- 0.2		- 3.6
Others		- 1.0	- 0.1			- 0.1	- 0.7		- 1.8
TFED	4.5	56.7	20.0			6.9	30.0		118.1
Industry	4.3	8.9	13.5			4.6	14.6		45.9
Transport		46.7	0.1				0.2		47.0
Residential		0.5	4.2			2.3	7.5		14.5
Commercial	0.1	0.5	2.2				7.8		10.6

2030	Mtoe								
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total
Production	371.2	27.6	124.7	4.1		22.6			550.3
Net Imports	- 302.3	44.9	- 80.9						- 338.4
TPED	68.9	72.5	43.8	4.1		22.6			211.9
Electricity and Heat Generation	- 64.3	- 1.5	- 19.7	- 4.1		- 15.1	37.4		- 67.2
Petroleum Refineries		- 3.4	- 0.3				- 0.2		- 3.9
Others		- 1.1				- 0.1	- 0.8		- 2.1
TFED	4.6	66.5	23.8			7.5	36.3		138.8
Industry	4.5	10.6	16.2			5.1	17.5		53.8
Transport		54.8	0.1				0.2		55.2
Residential		0.6	4.8			2.4	9.0		16.7
Commercial	0.1	0.6	2.7				9.6		13.0

OCEANIA
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)	315	631	793	1 003	1 244	3.2	2.9	2.4	2.2	2.5
Population (million)	21.0	29.1	32.1	35.8	39.2	1.5	1.2	1.1	0.9	1.1
GDP per capita (2000 PPP US\$)	14 949	21 695	24 708	28 016	31 712	1.7	1.6	1.3	1.2	1.4
GDP in Services (2000 PPP US\$ billion)	190	415	539	713	913	3.6	3.3	2.8	2.5	2.9
GDP in Industry (2000 PPP US\$ billion)	88	162	201	263	332	2.8	2.7	2.7	2.3	2.6
Urbanisation level (%)	75	76	77	77	78	0.1	0.1	0.1	0.1	0.1

ENERGY PROJECTIONS

	Mtoe					Growth rate (% per annum)				
	1980	2002	2010	2020	2030	80-02	02-10	10-20	20-30	02-30
Production	91.6	259.0	356.8	462.1	550.3	4.8	4.1	2.6	1.8	2.7
Coal	53.7 (59%)	177.5 (69%)	255.2 (72%)	314.2 (68%)	371.2 (67%)	5.6	4.6	2.1	1.7	2.7
Oil	21.7 (24%)	36.9 (14%)	30.4 (9%)	28.1 (6%)	27.6 (5%)	2.4	- 2.4	- 0.8	- 0.1	- 1.0
Gas	8.3 (9%)	32.6 (13%)	54.7 (15%)	98.3 (21%)	124.7 (23%)	6.4	6.7	6.0	2.4	4.9
Hydro	2.8 (3%)	3.3 (1%)	3.9 (1%)	4.1 (1%)	4.1 (1%)	0.8	1.9	0.6		0.8
NRE	5.2 (6%)	8.8 (3%)	12.6 (4%)	17.5 (4%)	22.6 (4%)	2.4	4.6	3.4	2.6	3.5
Nuclear										
Net Imports	- 12.5	- 129.6	- 205.9	- 281.2	- 338.4	11.2	6.0	3.2	1.9	3.5
Coal	- 28.5	- 133.3	- 202.6	- 253.9	- 302.3	7.3	5.4	2.3	1.8	3.0
Oil	16.0	12.5	21.9	34.0	44.9	- 1.1	7.2	4.5	2.8	4.7
Gas		- 8.9	- 25.2	- 61.4	- 80.9		13.9	9.3	2.8	8.2
Electricity										
Total Primary Energy Demand	80.2	132.8	150.9	180.9	211.9	2.3	1.6	1.8	1.6	1.7
Coal	28.3 (35%)	48.1 (36%)	52.6 (35%)	60.4 (33%)	68.9 (32%)	2.4	1.1	1.4	1.3	1.3
Oil	35.7 (44%)	48.9 (37%)	52.3 (35%)	62.1 (34%)	72.5 (34%)	1.4	0.8	1.7	1.6	1.4
Gas	8.3 (10%)	23.7 (18%)	29.5 (20%)	36.9 (20%)	43.8 (21%)	4.9	2.8	2.2	1.7	2.2
Hydro	2.8 (3%)	3.3 (3%)	3.9 (3%)	4.1 (2%)	4.1 (2%)	0.8	1.9	0.6		0.8
NRE	5.2 (6%)	8.8 (7%)	12.6 (8%)	17.5 (10%)	22.6 (11%)	2.4	4.6	3.4	2.6	3.5
Nuclear										
Input for Electricity and Heat Generation	- 27.6	- 61.4	- 73.0	- 88.4	- 104.6	3.7	2.2	1.9	1.7	1.9
Coal	- 20.3 (74%)	- 44.5 (72%)	- 48.3 (66%)	- 55.9 (63%)	- 64.3 (61%)	3.6	1.0	1.5	1.4	1.3
Oil	- 1.4 (5%)	- 1.3 (2%)	- 1.1 (2%)	- 1.3 (1%)	- 1.5 (1%)	- 0.2	- 1.9	1.5	1.0	0.3
Gas	- 1.9 (7%)	- 9.1 (15%)	- 13.4 (18%)	- 16.6 (19%)	- 19.7 (19%)	7.5	5.0	2.2	1.7	2.8
Hydro	- 2.8 (10%)	- 3.3 (5%)	- 3.9 (5%)	- 4.1 (5%)	- 4.1 (4%)	0.8	1.9	0.6		0.8
NRE	- 1.2 (4%)	- 3.2 (5%)	- 6.2 (9%)	- 10.5 (12%)	- 15.1 (14%)	4.5	8.7	5.4	3.7	5.7
Nuclear										
Other Transformation	- 4.7	- 4.0	- 4.8	- 5.4	- 6.0	- 0.8	2.2	1.2	1.1	1.4
Coal	- 0.5 (10%)									
Oil	- 3.0 (64%)	- 3.1 (77%)	- 3.6 (77%)	- 4.1 (76%)	- 4.5 (76%)	0.1	2.1	1.1	1.0	1.4
Gas	- 0.8 (17%)	- 0.3 (8%)	- 0.3 (7%)	- 0.3 (6%)	- 0.4 (6%)	- 4.4	0.7	0.6	0.6	0.6
NRE		- 0.1 (1%)	- 0.1 (1%)	- 0.1 (1%)	- 0.1 (1%)		0.2	0.2		0.1
Electricity	- 0.3 (6%)	- 0.5 (14%)	- 0.7 (16%)	- 0.9 (17%)	- 1.0 (17%)	3.0	3.8	1.9	1.5	2.3
Heat	- 0.1 (3%)									

OCEANIA

	Mtoe					Growth rate (% per annum)				
	1980	2002	2010	2020	2030	80-02	02-10	10-20	20-30	02-30
Total Final Energy Demand	52.4	83.3	98.0	118.1	138.8	2.1	2.0	1.9	1.6	1.8
Coal	5.0 (10%)	3.7 (4%)	4.3 (4%)	4.5 (4%)	4.6 (3%)	- 1.4	2.0	0.4	0.3	0.8
Oil	29.2 (56%)	40.7 (49%)	47.5 (48%)	56.7 (48%)	66.5 (48%)	1.5	2.0	1.8	1.6	1.8
Gas	5.7 (11%)	13.9 (17%)	15.8 (16%)	20.0 (17%)	23.8 (17%)	4.1	1.6	2.3	1.8	1.9
NRE	4.0 (8%)	5.5 (7%)	6.3 (6%)	6.9 (6%)	7.5 (5%)	1.5	1.6	1.0	0.8	1.1
Electricity	8.6 (16%)	19.5 (23%)	24.1 (25%)	30.0 (25%)	36.3 (26%)	3.8	2.6	2.3	1.9	2.2
Heat										
Industry	22.2	31.8	37.4	45.9	53.8	1.6	2.0	2.1	1.6	1.9
Coal	4.5 (20%)	3.4 (11%)	4.1 (11%)	4.3 (9%)	4.5 (8%)	- 1.3	2.3	0.5	0.3	1.0
Oil	7.6 (34%)	6.5 (20%)	7.3 (20%)	8.9 (19%)	10.6 (20%)	- 0.8	1.6	2.0	1.7	1.8
Gas	4.1 (19%)	9.6 (30%)	10.6 (28%)	13.5 (29%)	16.2 (30%)	3.9	1.2	2.5	1.8	1.9
NRE	2.2 (10%)	3.3 (10%)	4.0 (11%)	4.6 (10%)	5.1 (9%)	1.8	2.4	1.4	1.1	1.6
Electricity	3.7 (17%)	9.1 (29%)	11.4 (31%)	14.6 (32%)	17.5 (32%)	4.2	2.9	2.4	1.8	2.4
Heat										
Transport	20.0	33.6	39.5	47.0	55.2	2.4	2.0	1.8	1.6	1.8
Coal		0.1 (0%)	0.1 (0%)	0.1 (0%)	0.1 (0%)		- 1.8			- 0.5
Oil	19.9 (100%)	33.4 (99%)	39.2 (99%)	46.7 (99%)	54.8 (99%)	2.4	2.0	1.8	1.6	1.8
Gas		0.03 (0%)	0.04 (0%)	0.1 (0%)	0.1 (0%)		5.4	3.8	1.7	3.5
NRE										
Electricity	0.1 (0%)	0.2 (1%)	0.2 (1%)	0.2 (0%)	0.2 (0%)	3.7	2.3	0.5	0.9	1.1
Residential	7.1	11.0	12.6	14.5	16.7	2.0	1.6	1.4	1.4	1.5
Coal	0.2 (3%)					-10.5				
Oil	0.8 (12%)	0.4 (4%)	0.5 (4%)	0.5 (3%)	0.6 (3%)	- 3.0	1.0	0.9	0.9	0.9
Gas	1.1 (16%)	2.9 (26%)	3.5 (28%)	4.2 (29%)	4.8 (29%)	4.3	2.4	1.8	1.5	1.9
NRE	1.7 (24%)	2.2 (20%)	2.3 (18%)	2.3 (16%)	2.4 (14%)	1.2	0.3	0.2	0.2	0.2
Electricity	3.2 (45%)	5.5 (50%)	6.3 (50%)	7.5 (52%)	9.0 (54%)	2.5	1.8	1.7	1.8	1.8
Heat										
Commercial	3.1	6.8	8.4	10.6	13.1	3.6	2.8	2.3	2.1	2.4
Coal	0.3 (9%)	0.2 (3%)	0.1 (2%)	0.1 (1%)	0.1 (1%)	- 1.9	- 2.5	- 1.9	- 1.4	- 1.9
Oil	0.8 (25%)	0.4 (6%)	0.5 (5%)	0.5 (5%)	0.6 (5%)	- 3.0	1.9	1.5	1.5	1.6
Gas	0.4 (14%)	1.4 (21%)	1.8 (21%)	2.2 (21%)	2.7 (20%)	5.5	2.8	2.3	1.9	2.3
NRE										
Electricity	1.6 (52%)	4.8 (71%)	6.1 (72%)	7.8 (73%)	9.6 (74%)	5.1	3.0	2.5	2.2	2.5
Heat										

Note: Net imports include intraregional trade

ENERGY SECURITY

	1980	2002	2010	2020	2030
Diversity of Primary Energy Demand (Rated between 1 and 100)	75	81	83	84	85
Net Energy Import Ratio (%)	-16	-100	-136	-155	-160
Net Oil Import Dependency (%)	45	26	42	55	62

OCEANIA
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)	118	258	315	389	469	3.6	2.5	2.2	1.9	2.2
Coal	70 (60%)	173 (67%)	194 (62%)	233 (60%)	277 (59%)	4.2	1.4	1.8	1.7	1.7
Oil	5 (4%)	5 (2%)	5 (1%)	6 (1%)	6 (1%)		- 1.7	1.9	1.5	0.7
Gas	9 (7%)	36 (14%)	56 (18%)	78 (20%)	104 (22%)	6.6	5.8	3.5	2.9	3.9
Hydro	32 (27%)	39 (15%)	45 (14%)	48 (12%)	48 (10%)	0.9	1.9	0.6		0.8
NRE	2 (2%)	5 (2%)	15 (5%)	25 (6%)	34 (7%)	4.5	14.1	5.5	3.0	7.0
Nuclear										
Total Installed Generation Capacity (GW)	31	58	73	97	112	2.9	3.0	2.9	1.5	2.4
Thermal	20 (66%)	43 (74%)	52 (71%)	71 (73%)	83 (74%)	3.5	2.4	3.2	1.6	2.4
Coal		28 (49%)	31 (43%)	41 (42%)	48 (43%)		1.3	2.8	1.6	1.9
Oil		2 (3%)	2 (3%)	2 (3%)	3 (2%)		1.0	2.5	1.2	1.6
Gas		13 (23%)	19 (26%)	27 (28%)	33 (29%)		4.5	3.9	1.7	3.3
Hydro	10 (34%)	13 (23%)	16 (22%)	18 (18%)	18 (16%)	1.1	2.5	0.9	0.2	1.1
NRE	0.2 (1%)	2 (3%)	5 (7%)	9 (9%)	11 (10%)	9.1	14.6	6.0	2.3	7.0

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)	255	211	190	180	170	- 0.9	- 1.3	- 0.5	- 0.6	- 0.8
Industry (toe per US\$ million GDP in Industry)	252	196	186	174	162	- 1.1	- 0.7	- 0.6	- 0.7	- 0.7
Commercial (toe per US\$ million GDP in Services)	16	16	16	15	14	0.0	- 0.6	- 0.5	- 0.4	- 0.5
Energy Intensity (kgoe per capita)	3 814	4 567	4 699	5 053	5 404	0.8	0.4	0.7	0.7	0.6
Industry	1 056	1 095	1 165	1 283	1 372	0.2	0.8	1.0	0.7	0.8
Transport	950	1 157	1 232	1 314	1 407	0.9	0.8	0.6	0.7	0.7
Residential	337	379	391	405	427	0.5	0.4	0.3	0.5	0.4
Commercial	148	234	263	297	333	2.1	1.5	1.2	1.1	1.3
CO₂ Emissions (million tonnes)	221	381	438	522	607	2.5	1.8	1.8	1.5	1.7
Electricity Generation	84	198	222	259	300	3.9	1.5	1.6	1.5	1.5
Transformation other than Electricity Generation	14	16	21	30	36	0.5	4.0	3.5	1.9	3.1
Industry	54	55	63	75	87	0.1	1.6	1.8	1.5	1.6
Transport	58	99	116	139	163	2.4	2.1	1.8	1.6	1.8
Residential	6	8	10	11	13	1.5	2.0	1.7	1.4	1.7
Commercial	4	5	6	7	9	0.8	1.9	1.9	1.6	1.8
CO₂ Emissions Intensity										
CO ₂ emissions per GDP (tonnes per US\$ million)	702	604	552	520	488	- 0.7	- 1.1	- 0.6	- 0.6	- 0.8
CO ₂ emissions per capita (tonnes per capita)	10.5	13.1	13.6	14.6	15.5	1.0	0.5	0.7	0.6	0.6

ENERGY INVESTMENT REQUIREMENTS

(Cumulative from 2003 -)	2010	2020	2030
Total (2000 US\$ billion)	69 - 86	156 - 191	223 - 275
Coal Production & Transportation	13 - 15	26 - 30	41 - 46
Oil & Gas Production & Processing	10 - 14	19 - 27	27 - 38
Oil & Gas International Trade	8 - 9	23 - 25	28 - 31
Oil & Gas Domestic Pipeline	9 - 13	17 - 24	23 - 33
Electricity Generation & Transmission	28 - 34	71 - 85	104 - 126