

CHINESE TAIPEI
ENERGY BALANCE TABLES

2002										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production			0.7	0.5	10.3	0.2				11.8
Net Imports	31.5	42.4	6.7							80.6
TPED	32.4	41.6	7.4	0.5	10.3	0.2				92.4
Electricity and Heat Generation	- 26.3	- 4.7	- 5.1	- 0.5	- 10.3	- 0.2	16.0			- 31.2
Petroleum Refineries		- 3.5	- 0.6				- 0.3			- 4.3
Others										
TFED	6.7	33.4	1.7				13.6			55.5
Industry	6.7	17.6	0.9				8.2			33.4
Transport		13.9					0.1			13.9
Residential		1.3	0.6				3.2			5.1
Commercial		0.6	0.2				2.2			3.0

2010										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production			0.7	0.6	13.6	2.0				16.8
Net Imports	35.8	52.1	13.6							101.5
TPED	35.8	52.1	14.3	0.6	13.6	2.0				118.3
Electricity and Heat Generation	- 27.5	- 3.6	- 11.3	- 0.6	- 13.6	- 2.0	20.9			- 37.6
Petroleum Refineries		- 4.4	- 0.7				- 0.4			- 5.5
Others										
TFED	8.3	44.1	2.2				20.6			75.2
Industry	8.3	25.1	1.2				13.3			47.8
Transport		16.9					0.1			17.0
Residential		1.5	0.8				4.3			6.6
Commercial		0.7	0.2				2.9			3.8

2020										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production			0.7	0.5	11.2	6.4				18.9
Net Imports	55.5	61.6	18.4							135.5
TPED	55.5	61.7	19.1	0.5	11.2	6.4				154.4
Electricity and Heat Generation	- 45.0	- 2.1	- 15.5	- 0.5	- 11.2	- 6.4	29.6			- 51.2
Petroleum Refineries		- 4.4	- 0.7				- 0.3			- 5.4
Others										
TFED	10.5	55.2	2.8				29.3			97.7
Industry	10.5	31.7	1.5				18.8			62.5
Transport		21.3					0.1			21.4
Residential		1.6	1.0				6.1			8.6
Commercial		0.7	0.3				4.2			5.2

2030										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production			0.7	0.6	6.4	11.8				19.6
Net Imports	65.0	69.5	24.5							159.0
TPED	65.0	69.6	25.2	0.6	6.4	11.8				178.6
Electricity and Heat Generation	- 53.6	- 1.5	- 21.2	- 0.6	- 6.4	- 11.8	36.1			- 59.0
Petroleum Refineries		- 4.2	- 0.7				- 0.3			- 5.2
Others										
TFED	11.4	63.9	3.3				35.8			114.4
Industry	11.4	36.2	1.8				22.3			71.7
Transport		25.3					0.2			25.4
Residential		1.6	1.2				7.8			10.5
Commercial		0.7	0.4				5.6			6.7

CHINESE TAIPEI
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)	109	441	621	903	1 184	6.5	4.4	3.8	2.7	3.6
Population (million)	17.6	22.4	23.2	24.3	24.6	1.1	0.4	0.4	0.1	0.3
GDP per capita (2000 PPP US\$)	6 206	19 693	26 745	37 215	48 077	5.4	3.9	3.4	2.6	3.2
GDP in Services (2000 PPP US\$ billion)	53	321	416	593	770	8.5	3.3	3.6	2.6	3.2
GDP in Industry (2000 PPP US\$ billion)	51	139	212	306	382	4.6	5.4	3.7	2.2	3.7
Urbanisation level (%)		79	78	77	76	-0.1	-0.2	-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	5.8	11.8	16.8	18.9	19.6	3.3	4.5	1.2	0.3	1.8
Coal	1.6 (27%)									
Oil	0.25 (4%)	0.05 (0%)	0.04 (0%)	0.05 (0%)	0.05 (0%)	-7.2	-1.4	0.7	0.4	
Gas	1.6 (27%)	0.7 (6%)	0.7 (4%)	0.7 (4%)	0.7 (4%)	-3.6	-0.6	0.2	0.3	
Hydro	0.3 (5%)	0.5 (5%)	0.6 (3%)	0.5 (3%)	0.6 (3%)	3.6	0.2	-0.4	0.3	
NRE	0.02 (0%)	0.2 (2%)	2.0 (12%)	6.4 (34%)	11.8 (60%)	11.7	30.9	12.5	6.3	15.1
Nuclear	2.1 (37%)	10.3 (87%)	13.6 (81%)	11.2 (59%)	6.4 (33%)	7.4	3.5	-1.9	-5.4	-1.7
Net Imports	24.5	80.6	101.5	135.5	159.0	5.6	2.9	2.9	1.6	2.5
Coal	3.1	31.5	35.8	55.5	65.0	11.1	1.6	4.5	1.6	2.6
Oil	21.4	42.4	52.1	61.6	69.5	3.2	2.6	1.7	1.2	1.8
Gas		6.7	13.6	18.4	24.5		9.3	3.0	2.9	4.7
Electricity										
Total Primary Energy Demand	28.5	92.4	118.3	154.4	178.6	5.5	3.1	2.7	1.5	2.4
Coal	3.9 (14%)	32.4 (35%)	35.8 (30%)	55.5 (36%)	65.0 (36%)	10.1	1.3	4.5	1.6	2.5
Oil	20.6 (72%)	41.6 (45%)	52.1 (44%)	61.7 (40%)	69.6 (39%)	3.2	2.9	1.7	1.2	1.9
Gas	1.6 (6%)	7.4 (8%)	14.3 (12%)	19.1 (12%)	25.2 (14%)	7.2	8.6	2.9	2.8	4.5
Hydro	0.3 (1%)	0.5 (1%)	0.6 (0%)	0.5 (0%)	0.6 (0%)	3.6	0.2	-0.4	0.3	0.03
NRE	0.02 (0%)	0.2 (0%)	2.0 (2%)	6.4 (4%)	11.8 (7%)	11.7	30.9	12.5	6.3	15.1
Nuclear	2.1 (7%)	10.3 (11%)	13.6 (11%)	11.2 (7%)	6.4 (4%)	7.4	3.5	-1.9	-5.4	-1.7
Input for Electricity and Heat Generation	-9.4	-47.2	-58.6	-80.9	-95.1	7.6	2.7	3.3	1.6	2.5
Coal	-1.6 (17%)	-26.3 (56%)	-27.5 (47%)	-45.0 (56%)	-53.6 (56%)	13.7	0.6	5.0	1.8	2.6
Oil	-5.4 (58%)	-4.7 (10%)	-3.6 (6%)	-2.1 (3%)	-1.5 (2%)	-0.6	-3.5	-5.1	-3.5	-4.0
Gas		-5.1 (11%)	-11.3 (19%)	-15.5 (19%)	-21.2 (22%)		10.5	3.2	3.2	5.2
Hydro	-0.3 (3%)	-0.5 (1%)	-0.6 (1%)	-0.5 (1%)	-0.6 (1%)	3.6	0.2	-0.4	0.3	0.03
NRE		-0.2 (0%)	-2.0 (3%)	-6.4 (8%)	-11.8 (12%)		30.9	12.5	6.3	15.1
Nuclear	-2.1 (23%)	-10.3 (22%)	-13.6 (23%)	-11.2 (14%)	-6.4 (7%)	7.4	3.5	-1.9	-5.4	-1.7
Other Transformation	-3.0	-4.4	-5.5	-5.4	-5.2	1.7	3.1	-0.2	-0.4	0.7
Coal										
Oil	-2.8 (94%)	-3.5 (80%)	-4.4 (80%)	-4.4 (81%)	-4.2 (81%)	1.0	3.1	-0.2	-0.3	0.7
Gas	-0.1 (2%)	-0.6 (13%)	-0.7 (13%)	-0.7 (13%)	-0.7 (13%)	10.8	2.9	-0.4	-0.5	0.5
NRE										
Electricity	-0.1 (3%)	-0.3 (7%)	-0.4 (7%)	-0.4 (7%)	-0.3 (6%)	5.4	2.8	-0.4	-0.5	0.5
Heat										

CHINESE TAIPEI

	Mtoe					Growth rate (% per annum)				
	1980	2002	2010	2020	2030	80-02	02-10	10-20	20-30	02-30
Total Final Energy Demand	18.3	55.5	75.2	97.7	114.4	5.2	3.9	2.7	1.6	2.6
Coal	2.1 (11%)	6.7 (12%)	8.3 (11%)	10.5 (11%)	11.4 (10%)	5.5	2.6	2.4	0.9	1.9
Oil	11.9 (65%)	33.4 (60%)	44.1 (59%)	55.2 (56%)	63.9 (56%)	4.8	3.5	2.3	1.5	2.3
Gas	1.4 (7%)	1.7 (3%)	2.2 (3%)	2.8 (3%)	3.3 (3%)	1.1	3.3	2.5	1.7	2.4
NRE										
Electricity	3.0 (16%)	13.6 (25%)	20.6 (27%)	29.3 (30%)	35.8 (31%)	7.1	5.3	3.6	2.0	3.5
Heat										
Industry	12.5	33.4	47.8	62.5	71.7	4.6	4.6	2.7	1.4	2.8
Coal	2.1 (17%)	6.7 (20%)	8.3 (17%)	10.5 (17%)	11.4 (16%)	5.5	2.6	2.4	0.9	1.9
Oil	7.2 (58%)	17.6 (53%)	25.1 (53%)	31.7 (51%)	36.2 (51%)	4.1	4.5	2.4	1.4	2.6
Gas	1.1 (9%)	0.9 (3%)	1.2 (2%)	1.5 (2%)	1.8 (2%)	-0.9	3.8	2.6	1.5	2.5
NRE										
Electricity	2.1 (17%)	8.2 (24%)	13.3 (28%)	18.8 (30%)	22.3 (31%)	6.3	6.2	3.6	1.7	3.6
Heat										
Transport	3.4	13.9	17.0	21.4	25.4	6.6	2.5	2.3	1.7	2.2
Coal										
Oil	3.4 (99%)	13.9 (99%)	16.9 (99%)	21.3 (99%)	25.3 (99%)	6.6	2.5	2.3	1.7	2.2
Gas										
NRE										
Electricity		0.1 (1%)	0.1 (1%)	0.1 (1%)	0.2 (1%)	6.4	3.7	2.7	2.3	2.8
Residential	1.6	5.1	6.6	8.6	10.5	5.4	3.2	2.7	2.1	2.6
Coal										
Oil	0.8 (47%)	1.3 (25%)	1.5 (22%)	1.6 (18%)	1.6 (15%)	2.5	1.6	0.6	0.3	0.8
Gas	0.2 (14%)	0.6 (12%)	0.8 (12%)	1.0 (11%)	1.2 (11%)	4.9	2.6	2.2	1.7	2.2
NRE										
Electricity	0.6 (38%)	3.2 (62%)	4.3 (66%)	6.1 (71%)	7.8 (74%)	7.8	3.9	3.4	2.5	3.2
Heat										
Commercial	0.8	3.0	3.8	5.2	6.7	6.2	2.9	3.3	2.5	2.9
Coal										
Oil	0.5 (64%)	0.6 (21%)	0.7 (17%)	0.7 (13%)	0.7 (11%)	0.9	0.6	0.6	0.6	0.6
Gas		0.2 (6%)	0.2 (6%)	0.3 (6%)	0.4 (6%)	7.2	3.3	2.8	2.3	2.7
NRE										
Electricity	0.2 (31%)	2.2 (73%)	2.9 (76%)	4.2 (81%)	5.6 (83%)	10.5	3.5	3.9	2.8	3.4
Heat										

ENERGY SECURITY

	1980	2002	2010	2020	2030
Diversity of Primary Energy Demand (Rated between 1 and 100)	47	75	80	80	80
Net Energy Import Ratio (%)	81	87	86	88	89
Net Oil Import Dependency (%)	100	100	100	100	100

CHINESE TAIPEI
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)	43	199	261	364	438	7.3	3.4	3.4	1.9	2.8
Coal	6 (14%)	107 (54%)	118 (45%)	204 (56%)	257 (59%)	14.0	1.2	5.7	2.3	3.2
Oil	26 (60%)	20 (10%)	15 (6%)	9 (3%)	7 (2%)	-1.1	-3.2	-4.8	-3.2	-3.8
Gas		26 (13%)	59 (23%)	84 (23%)	119 (27%)		10.9	3.6	3.5	5.6
Hydro	3 (7%)	6 (3%)	6 (2%)	6 (2%)	6 (1%)	3.6	0.2	-0.4	0.3	0.03
NRE		1 (0%)	10 (4%)	17 (5%)	24 (6%)		39.2	5.7	3.9	13.6
Nuclear	8 (19%)	40 (20%)	52 (20%)	43 (12%)	25 (6%)	7.4	3.5	-1.9	-5.4	-1.7
Total Installed Generation Capacity (GW)	9	37	54	73	86	6.6	4.8	3.1	1.6	3.0
Thermal	6 (70%)	29 (78%)	37 (69%)	56 (77%)	70 (81%)	7.1	3.3	4.2	2.2	3.2
Coal	1 (11%)	13 (35%)	19 (35%)	34 (47%)	44 (51%)	12.5	4.8	6.2	2.4	4.4
Oil	5 (59%)	4 (10%)	4 (7%)	2 (3%)	2 (2%)	-1.9	-0.03	-4.5	-3.3	-2.8
Gas		12 (33%)	15 (27%)	19 (26%)	24 (28%)		2.4	2.7	2.3	2.5
Hydro	1 (15%)	3 (7%)	6 (11%)	6 (8%)	6 (7%)	2.9	10.5	0.6		3.1
NRE		0.5 (1%)	3 (6%)	5 (6%)	6 (7%)		25.4	4.2	3.1	9.5
Nuclear	1 (14%)	5 (14%)	8 (15%)	7 (9%)	4 (4%)	6.5	5.4	-1.8	-5.7	-1.2

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)	260	210	191	171	151	-1.0	-1.2	-1.1	-1.2	-1.2
Industry (toe per US\$ million GDP in Industry)	242	240	225	204	188	-0.04	-0.8	-1.0	-0.8	-0.9
Commercial (toe per US\$ million GDP in Services)	15	9	9	9	9	-2.1	-0.4	-0.3	-0.1	-0.2
Energy Intensity (kgoe per capita)	1 617	4 128	5 097	6 364	7 254	4.4	2.7	2.2	1.3	2.0
Industry	707	1 491	2 059	2 578	2 914	3.4	4.1	2.3	1.2	2.4
Transport	194	623	732	881	1 033	5.5	2.0	1.9	1.6	1.8
Residential	91	229	284	354	428	4.3	2.7	2.2	1.9	2.3
Commercial	45	134	162	215	272	5.1	2.5	2.9	2.3	2.6
CO₂ Emissions (million tonnes)	72.9	265.9	323.6	439.8	515.2	6.1	2.5	3.1	1.6	2.4
Electricity Generation	23.4	128.3	144.2	217.4	262.0	8.0	1.5	4.2	1.9	2.6
Transformation other than Electricity Generation	5.6	8.3	10.5	10.1	9.6	1.8	3.0	-0.4	-0.5	0.5
Industry	29.6	81.6	111.1	140.4	158.5	4.7	3.9	2.4	1.2	2.4
Transport	10.1	40.0	49.0	62.1	74.3	6.5	2.6	2.4	1.8	2.2
Residential	2.5	5.4	6.3	7.0	7.6	3.5	1.9	1.1	0.8	1.2
Commercial	1.7	2.3	2.5	2.8	3.2	1.5	1.0	1.1	1.3	1.2
CO₂ Emissions Intensity										
CO ₂ emissions per GDP (tonnes per US\$ million)	665.9	602.9	521.2	487.2	435.3	-0.5	-1.8	-0.7	-1.1	-1.2
CO ₂ emissions per capita (tonnes per capita)	4.1	11.9	13.9	18.1	20.9	4.9	2.0	2.7	1.4	2.0

ENERGY INVESTMENT REQUIREMENTS

(Cumulative from 2003 -)	2010	2020	2030
Total (2000 US\$ billion)	37.6 - 45.3	76.1 - 91.2	104.3 - 125.2
Coal Production & Transportation			
Oil & Gas Production & Processing	9.04 - 11.18	13.61 - 17.69	17.40 - 23.08
Oil & Gas International Trade	1.00 - 1.51	1.63 - 2.43	2.36 - 3.38
Oil & Gas Domestic Pipeline	0.46 - 0.65	0.77 - 1.10	1.18 - 1.68
Electricity Generation & Transmission	27.15 - 31.99	60.05 - 70.00	83.34 - 97.03