

CANADA  
ENERGY BALANCE TABLES

<b>2002</b>										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production	32.7	133.3	150.3	30.2	22.6	11.6				380.5
Net Imports	1.2	- 45.1	- 72.6				- 6.1			- 122.7
<b>TPED</b>	<b>33.8</b>	<b>88.2</b>	<b>77.7</b>	<b>30.2</b>	<b>22.6</b>	<b>11.6</b>	<b>- 6.1</b>			<b>257.9</b>
Electricity and Heat Generation	- 30.9	- 3.6	- 11.3	- 30.2	- 22.6	- 2.1	50.3	0.8		- 49.5
Petroleum Refineries		- 6.5	- 1.0				- 0.5			- 8.0
Others	- 0.1	- 1.5	- 17.4				- 1.8			- 20.9
<b>TFED</b>	<b>2.9</b>	<b>76.5</b>	<b>48.0</b>			<b>9.4</b>	<b>41.8</b>	<b>0.8</b>		<b>179.5</b>
Industry	2.8	18.0	22.8			7.6	18.4	0.8		70.4
Transport		48.5					0.1			48.6
Residential		3.0	13.9			1.8	12.3			31.1
Commercial		6.9	11.3				11.2			29.4

  

<b>2010</b>										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production	40.2	205.7	139.8	32.6	20.8	14.9				454.0
Net Imports	- 16.8	- 105.1	- 45.6				- 1.5			- 169.0
<b>TPED</b>	<b>23.5</b>	<b>100.6</b>	<b>94.2</b>	<b>32.6</b>	<b>20.8</b>	<b>14.9</b>	<b>- 1.5</b>			<b>285.0</b>
Electricity and Heat Generation	- 20.6	- 3.4	- 16.1	- 32.6	- 20.8	- 3.8	52.4	1.0		- 43.9
Petroleum Refineries		- 7.4	- 1.1				- 0.6			- 9.1
Others	- 0.1	- 2.2	- 22.8				- 2.4			- 27.6
<b>TFED</b>	<b>2.7</b>	<b>87.6</b>	<b>54.1</b>			<b>11.1</b>	<b>47.9</b>	<b>1.0</b>		<b>204.4</b>
Industry	2.7	21.4	25.5			9.2	21.8	1.0		81.6
Transport		56.0	0.1				0.1			56.2
Residential		2.8	15.7			1.9	13.9			34.3
Commercial		7.4	12.8				12.2			32.4

  

<b>2020</b>										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production	40.6	230.7	125.2	33.8	19.3	19.4				469.0
Net Imports	- 17.1	- 116.2	- 13.9				- 1.3			- 148.6
<b>TPED</b>	<b>23.5</b>	<b>114.5</b>	<b>111.3</b>	<b>33.8</b>	<b>19.3</b>	<b>19.4</b>	<b>- 1.3</b>			<b>320.4</b>
Electricity and Heat Generation	- 20.6	- 3.5	- 24.9	- 33.8	- 19.3	- 6.2	59.6	1.1		- 47.6
Petroleum Refineries		- 7.6	- 1.2				- 0.6			- 9.3
Others	- 0.1	- 2.4	- 23.4				- 2.5			- 28.5
<b>TFED</b>	<b>2.8</b>	<b>100.6</b>	<b>61.8</b>			<b>13.2</b>	<b>55.2</b>	<b>1.1</b>		<b>234.7</b>
Industry	2.8	23.6	28.6			11.2	26.0	1.1		93.3
Transport		66.5	0.1				0.1			66.7
Residential		2.5	18.3			2.0	15.7			38.5
Commercial		8.0	14.8				13.4			36.1

  

<b>2030</b>										Mtoe
	Coal	Oil	Gas	Hydro	Nuclear	NRE	Electricity	Heat	Total	
Production	42.2	235.7	109.3	33.5	17.2	24.3				462.1
Net Imports	- 17.9	- 111.2	15.5				- 1.5			- 115.1
<b>TPED</b>	<b>24.3</b>	<b>124.6</b>	<b>124.8</b>	<b>33.5</b>	<b>17.2</b>	<b>24.3</b>	<b>- 1.5</b>			<b>347.0</b>
Electricity and Heat Generation	- 21.4	- 3.3	- 32.8	- 33.5	- 17.2	- 9.2	65.8	1.3		- 50.4
Petroleum Refineries		- 7.7	- 1.2				- 0.6			- 9.4
Others	- 0.1	- 2.3	- 22.3				- 2.4			- 27.2
<b>TFED</b>	<b>2.7</b>	<b>111.2</b>	<b>68.4</b>			<b>15.1</b>	<b>61.2</b>	<b>1.3</b>		<b>260.0</b>
Industry	2.7	25.1	31.0			13.0	29.9	1.2		103.0
Transport		75.4	0.1				0.1			75.6
Residential		2.3	21.1			2.1	16.9			42.4
Commercial		8.5	16.3				14.3			39.1

## CANADA

## 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)	518	961	1 194	1 517	1 792	2.8	2.8	2.4	1.7	2.3
<b>Population</b> (million)	24.5	31.3	33.3	35.4	37.0	1.1	0.8	0.6	0.4	0.6
<b>GDP per capita</b> (2000 PPP US\$)	21 185	30 672	35 815	42 821	48 386	1.7	2.0	1.8	1.2	1.6
<b>GDP in Services</b> (2000 PPP US\$ billion)	297	585	742	973	1 209	3.1	3.0	2.7	2.2	2.6
<b>GDP in Industry</b> (2000 PPP US\$ billion)	185	282	351	443	525	1.9	2.8	2.4	1.7	2.2
<b>Urbanisation level</b> (%)	76	80	83	85	87	0.3	0.4	0.3	0.2	0.3

## 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>207.4</b>	<b>380.5</b>	<b>454.0</b>	<b>469.0</b>	<b>462.1</b>	<b>2.8</b>	<b>2.2</b>	<b>0.3</b>	<b>-0.1</b>	<b>0.7</b>
Coal	20.5 (10%)	32.7 (9%)	40.2 (9%)	40.6 (9%)	42.2 (9%)	2.1	2.6	0.1	0.4	0.9
Oil	83.6 (40%)	133.3 (35%)	205.7 (45%)	230.7 (49%)	235.7 (51%)	2.1	5.6	1.2	0.2	2.1
Gas	63.6 (31%)	150.3 (39%)	139.8 (31%)	125.2 (27%)	109.3 (24%)	4.0	-0.9	-1.1	-1.3	-1.1
Hydro	21.6 (10%)	30.2 (8%)	32.6 (7%)	33.8 (7%)	33.5 (7%)	1.5	1.0	0.4	-0.1	0.4
NRE	7.6 (4%)	11.6 (3%)	14.9 (3%)	19.4 (4%)	24.3 (5%)	1.9	3.2	2.7	2.3	2.7
Nuclear	10.4 (5%)	22.6 (6%)	20.8 (5%)	19.3 (4%)	17.2 (4%)	3.6	-1.0	-0.7	-1.2	-1.0
<b>Net Imports</b>	<b>-12.0</b>	<b>-122.7</b>	<b>-169.0</b>	<b>-148.6</b>	<b>-115.1</b>	<b>11.2</b>	<b>4.1</b>	<b>-1.3</b>	<b>-2.5</b>	<b>-0.2</b>
Coal	0.3	1.2	-16.8	-17.1	-17.9	5.7		0.2	0.4	
Oil	8.4	-45.1	-105.1	-116.2	-111.2		11.1	1.0	-0.4	3.3
Gas	-18.4	-72.6	-45.6	-13.9	15.5	6.4	-5.6	-11.2		
Electricity	-2.3	-6.1	-1.5	-1.3	-1.5	4.5	-16.3	-1.2	1.5	-4.8
<b>Total Primary Energy Demand</b>	<b>193.0</b>	<b>257.9</b>	<b>285.0</b>	<b>320.4</b>	<b>347.0</b>	<b>1.3</b>	<b>1.3</b>	<b>1.2</b>	<b>0.8</b>	<b>1.1</b>
Coal	21.2 (11%)	33.8 (13%)	23.5 (8%)	23.5 (7%)	24.3 (7%)	2.1	-4.5		0.3	-1.2
Oil	88.9 (46%)	88.2 (34%)	100.6 (35%)	114.5 (36%)	124.6 (36%)		1.7	1.3	0.8	1.2
Gas	45.6 (24%)	77.7 (30%)	94.2 (33%)	111.3 (35%)	124.8 (36%)	2.5	2.4	1.7	1.1	1.7
Hydro	21.6 (11%)	30.2 (12%)	32.6 (11%)	33.8 (11%)	33.5 (10%)	1.5	1.0	0.4	-0.1	0.4
NRE	7.6 (4%)	11.6 (4%)	14.9 (5%)	19.4 (6%)	24.3 (7%)	1.9	3.2	2.7	2.3	2.7
Nuclear	10.4 (5%)	22.6 (9%)	20.8 (7%)	19.3 (6%)	17.2 (5%)	3.6	-1.0	-0.7	-1.2	-1.0
<b>Input for Electricity and Heat Generation</b>	<b>-52.2</b>	<b>-100.6</b>	<b>-97.3</b>	<b>-108.3</b>	<b>-117.4</b>	<b>3.0</b>	<b>-0.4</b>	<b>1.1</b>	<b>0.8</b>	<b>0.6</b>
Coal	-15.0 (29%)	-30.9 (31%)	-20.6 (21%)	-20.6 (19%)	-21.4 (18%)	3.3	-4.9		0.4	-1.3
Oil	-3.2 (6%)	-3.6 (4%)	-3.4 (3%)	-3.5 (3%)	-3.3 (3%)	0.6	-0.9	0.6	-0.6	-0.3
Gas	-1.8 (3%)	-11.3 (11%)	-16.1 (17%)	-24.9 (23%)	-32.8 (28%)	8.8	4.6	4.5	2.8	3.9
Hydro	-21.6 (41%)	-30.2 (30%)	-32.6 (33%)	-33.8 (31%)	-33.5 (29%)	1.5	1.0	0.4	-0.1	0.4
NRE	-0.2 (0%)	-2.1 (2%)	-3.8 (4%)	-6.2 (6%)	-9.2 (8%)	10.7	7.6	4.9	4.0	5.3
Nuclear	-10.4 (20%)	-22.6 (22%)	-20.8 (21%)	-19.3 (18%)	-17.2 (15%)	3.6	-1.0	-0.7	-1.2	-1.0
<b>Other Transformation</b>	<b>-12.1</b>	<b>-28.9</b>	<b>-36.7</b>	<b>-37.8</b>	<b>-36.6</b>	<b>4.0</b>	<b>3.0</b>	<b>0.3</b>	<b>-0.3</b>	<b>0.9</b>
Coal	-0.004 (0%)	-0.1 (0%)	-0.1 (0%)	-0.1 (0%)	-0.1 (0%)	15.7	2.1	-0.3	-0.2	0.4
Oil	-6.3 (52%)	-8.0 (28%)	-9.6 (26%)	-9.9 (26%)	-10.0 (27%)	1.1	2.3	0.3	0.05	0.8
Gas	-5.4 (45%)	-18.4 (64%)	-23.9 (65%)	-24.6 (65%)	-23.5 (64%)	5.7	3.3	0.3	-0.5	0.9
NRE										
Electricity	-0.4 (3%)	-2.3 (8%)	-3.0 (8%)	-3.1 (8%)	-3.0 (8%)	8.5	3.3	0.3	-0.3	0.9
Heat										

## CANADA

	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>148.5</b>	<b>179.5</b>	<b>204.4</b>	<b>234.7</b>	<b>260.0</b>	<b>0.9</b>	<b>1.6</b>	<b>1.4</b>	<b>1.0</b>	<b>1.3</b>
Coal	4.2 (3%)	2.9 (2%)	2.7 (1%)	2.8 (1%)	2.7 (1%)	-1.7	-0.5	0.2	-0.2	-0.2
Oil	75.4 (51%)	76.5 (43%)	87.6 (43%)	100.6 (43%)	111.2 (43%)	0.1	1.7	1.4	1.0	1.3
Gas	34.6 (23%)	48.0 (27%)	54.1 (26%)	61.8 (26%)	68.4 (26%)	1.5	1.5	1.3	1.0	1.3
NRE	7.4 (5%)	9.4 (5%)	11.1 (5%)	13.2 (6%)	15.1 (6%)	1.1	2.0	1.8	1.4	1.7
Electricity	25.9 (17%)	41.8 (23%)	47.9 (23%)	55.2 (24%)	61.2 (24%)	2.2	1.7	1.4	1.0	1.4
Heat	1.0 (1%)	0.8 (0%)	1.0 (0%)	1.1 (0%)	1.3 (0%)	-0.9	1.8	1.5	1.0	1.4
<b>Industry</b>	<b>58.7</b>	<b>70.4</b>	<b>81.6</b>	<b>93.3</b>	<b>103.0</b>	<b>0.8</b>	<b>1.8</b>	<b>1.4</b>	<b>1.0</b>	<b>1.4</b>
Coal	4.1 (7%)	2.8 (4%)	2.7 (3%)	2.8 (3%)	2.7 (3%)	-1.7	-0.5	0.2	-0.2	-0.1
Oil	17.0 (29%)	18.0 (26%)	21.4 (26%)	23.6 (25%)	25.1 (24%)	0.3	2.2	1.0	0.6	1.2
Gas	18.8 (32%)	22.8 (32%)	25.5 (31%)	28.6 (31%)	31.0 (30%)	0.9	1.4	1.2	0.8	1.1
NRE	5.5 (9%)	7.6 (11%)	9.2 (11%)	11.2 (12%)	13.0 (13%)	1.5	2.3	2.0	1.6	1.9
Electricity	12.3 (21%)	18.4 (26%)	21.8 (27%)	26.0 (28%)	29.9 (29%)	1.8	2.2	1.8	1.4	1.8
Heat	1.0 (2%)	0.8 (1%)	1.0 (1%)	1.1 (1%)	1.2 (1%)	-0.8	1.8	1.5	1.0	1.4
<b>Transport</b>	<b>43.1</b>	<b>48.6</b>	<b>56.2</b>	<b>66.7</b>	<b>75.6</b>	<b>0.6</b>	<b>1.8</b>	<b>1.7</b>	<b>1.3</b>	<b>1.6</b>
Coal										
Oil	43.1 (100%)	48.5 (100%)	56.0 (100%)	66.5 (100%)	75.4 (100%)	0.5	1.8	1.7	1.3	1.6
Gas			0.1 (0%)	0.1 (0%)	0.1 (0%)		5.1	2.9	2.1	3.2
NRE										
Electricity		0.1 (0%)	0.1 (0%)	0.1 (0%)	0.1 (0%)		0.3			0.1
<b>Residential</b>	<b>28.4</b>	<b>31.1</b>	<b>34.3</b>	<b>38.5</b>	<b>42.4</b>	<b>0.4</b>	<b>1.2</b>	<b>1.2</b>	<b>1.0</b>	<b>1.1</b>
Coal	0.08 (0%)	0.03 (0%)	0.02 (0%)	0.01 (0%)	0.01 (0%)	-4.5	-4.7	-4.5	-5.2	-4.8
Oil	10.4 (37%)	3.0 (10%)	2.8 (8%)	2.5 (6%)	2.3 (5%)	-5.5	-1.2	-1.2	-0.8	-1.0
Gas	8.7 (31%)	13.9 (45%)	15.7 (46%)	18.3 (47%)	21.1 (50%)	2.1	1.5	1.5	1.5	1.5
NRE	1.9 (7%)	1.8 (6%)	1.9 (6%)	2.0 (5%)	2.1 (5%)	-0.2	0.6	0.5	0.4	0.5
Electricity	7.3 (26%)	12.3 (39%)	13.9 (40%)	15.7 (41%)	16.9 (40%)	2.4	1.6	1.3	0.7	1.2
Heat										
<b>Commercial</b>	<b>18.3</b>	<b>29.4</b>	<b>32.4</b>	<b>36.1</b>	<b>39.1</b>	<b>2.2</b>	<b>1.2</b>	<b>1.1</b>	<b>0.8</b>	<b>1.0</b>
Coal										
Oil	5.0 (27%)	6.9 (24%)	7.4 (23%)	8.0 (22%)	8.5 (22%)	1.5	0.8	0.8	0.6	0.7
Gas	7.0 (38%)	11.3 (38%)	12.8 (40%)	14.8 (41%)	16.3 (42%)	2.2	1.6	1.4	1.0	1.3
NRE										
Electricity	6.2 (34%)	11.2 (38%)	12.2 (38%)	13.4 (37%)	14.3 (37%)	2.7	1.1	0.9	0.7	0.9
Heat										

## ENERGY SECURITY

	1980	2002	2010	2020	2030
Diversity of Primary Energy Demand (Rated between 1 and 100)	81	89	86	84	83
Net Energy Import Ratio (%)	-6	-48	-59	-46	-33
Net Oil Import Dependency (%)	9	-51	-105	-102	-89

**CANADA**  
**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>373</b>	<b>601</b>	<b>628</b>	<b>712</b>	<b>782</b>	<b>2.2</b>	<b>0.5</b>	<b>1.3</b>	<b>1.0</b>	<b>0.9</b>
Coal	60 (16%)	117 (20%)	83 (13%)	88 (12%)	97 (12%)	3.1	-4.3	0.6	1.0	-0.7
Oil	14 (4%)	14 (2%)	13 (2%)	14 (2%)	13 (2%)	0.2	-1.0	0.6	-0.6	-0.3
Gas	9 (2%)	34 (6%)	57 (9%)	103 (14%)	153 (19%)	6.1	6.6	6.2	4.0	5.5
Hydro	251 (67%)	351 (58%)	379 (60%)	393 (55%)	389 (50%)	1.5	1.0	0.4	-0.1	0.4
NRE	1	9 (2%)	24 (4%)	43 (6%)	64 (8%)	9.4	12.4	6.0	4.2	7.1
Nuclear	38 (10%)	76 (13%)	72 (12%)	71 (10%)	66 (8%)	3.2	-0.5	-0.2	-0.7	-0.5
<b>Total Installed Generation Capacity (GW)</b>	<b>83</b>	<b>122</b>	<b>131</b>	<b>147</b>	<b>162</b>	<b>1.8</b>	<b>0.9</b>	<b>1.2</b>	<b>1.0</b>	<b>1.0</b>
Thermal	28 (34%)	40 (32%)	42 (32%)	53 (36%)	62 (38%)	1.5	0.8	2.3	1.7	1.6
Coal	13 (16%)	17 (14%)	18 (13%)	19 (13%)	19 (12%)	1.3	0.3	0.5	0.3	0.4
Oil	8 (10%)	7 (6%)	7 (6%)	8 (5%)	8 (5%)	-0.5	-0.3	1.0	0.3	0.4
Gas	4 (4%)	15 (12%)	17 (13%)	26 (18%)	35 (22%)	6.8	1.8	4.2	3.0	3.1
Hydro	48 (58%)	69 (57%)	71 (54%)	73 (50%)	75 (46%)	1.7	0.3	0.3	0.3	0.3
NRE	0.4 (0%)	2 (2%)	4 (3%)	8 (5%)	12 (7%)	7.4	11.1	5.7	4.1	6.6
Nuclear	6 (7%)	11 (9%)	14 (10%)	14 (9%)	14 (8%)	2.9	2.7			0.8

**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>372</b>	<b>268</b>	<b>239</b>	<b>211</b>	<b>194</b>	<b>-1.5</b>	<b>-1.5</b>	<b>-1.2</b>	<b>-0.9</b>	<b>-1.2</b>
Industry (toe per US\$ million GDP in Industry)	318	250	233	211	196	-1.1	-0.9	-1.0	-0.7	-0.9
Commercial (toe per US\$ million GDP in Services)	62	50	44	37	32	-0.9	-1.7	-1.6	-1.4	-1.6
<b>Energy Intensity (kgoe per capita)</b>	<b>7 887</b>	<b>8 233</b>	<b>8 547</b>	<b>9 047</b>	<b>9 368</b>	<b>0.2</b>	<b>0.5</b>	<b>0.6</b>	<b>0.3</b>	<b>0.5</b>
Industry	2 400	2 249	2 446	2 636	2 780	-0.3	1.1	0.8	0.5	0.8
Transport	1 759	1 552	1 684	1 882	2 040	-0.6	1.0	1.1	0.8	1.0
Residential	1 162	992	1 029	1 088	1 146	-0.7	0.5	0.6	0.5	0.5
Commercial	749	939	972	1 020	1 055	1.0	0.4	0.5	0.3	0.4
<b>CO<sub>2</sub> Emissions (million tonnes)</b>	<b>421</b>	<b>574</b>	<b>608</b>	<b>687</b>	<b>751</b>	<b>1.4</b>	<b>0.7</b>	<b>1.2</b>	<b>0.9</b>	<b>1.0</b>
Electricity Generation	71	157	128	149	170	3.7	-2.5	1.5	1.3	0.3
Transformation other than Electricity Generation	34	70	88	90	87	3.3	2.9	0.3	-0.3	0.8
Industry	106	115	130	143	152	0.4	1.6	1.0	0.6	1.0
Transport	126	142	165	196	222	0.6	1.8	1.7	1.3	1.6
Residential	52	42	45	50	56	-1.0	1.0	1.1	1.1	1.1
Commercial	32	48	53	59	64	1.8	1.3	1.1	0.8	1.1
<b>CO<sub>2</sub> Emissions Intensity</b>										
CO <sub>2</sub> emissions per GDP (tonnes per US\$ million)	812	597	509	453	419	-1.4	-2.0	-1.2	-0.8	-1.3
CO <sub>2</sub> emissions per capita (tonnes per capita)	17.2	18.3	18.2	19.4	20.3	0.3	-0.1	0.6	0.5	0.4

**ENERGY INVESTMENT REQUIREMENTS**

(Cumulative from 2003 - )	2010	2020	2030
<b>Total (2000 US\$ billion)</b>	<b>148 - 213</b>	<b>255 - 361</b>	<b>335 - 464</b>
Coal Production & Transportation	1.9 - 2.2	2.9 - 3.2	4.1 - 4.5
Oil & Gas Production & Processing	89.5 - 133.5	143.9 - 212.3	175.4 - 256.5
Oil & Gas International Trade	22.1 - 32.7	34.7 - 50.0	47.0 - 64.2
Oil & Gas Domestic Pipeline	8.1 - 11.6	16.7 - 23.8	23.3 - 33.3
Electricity Generation & Transmission	26.3 - 33.0	57.2 - 71.3	85.1 - 105.4