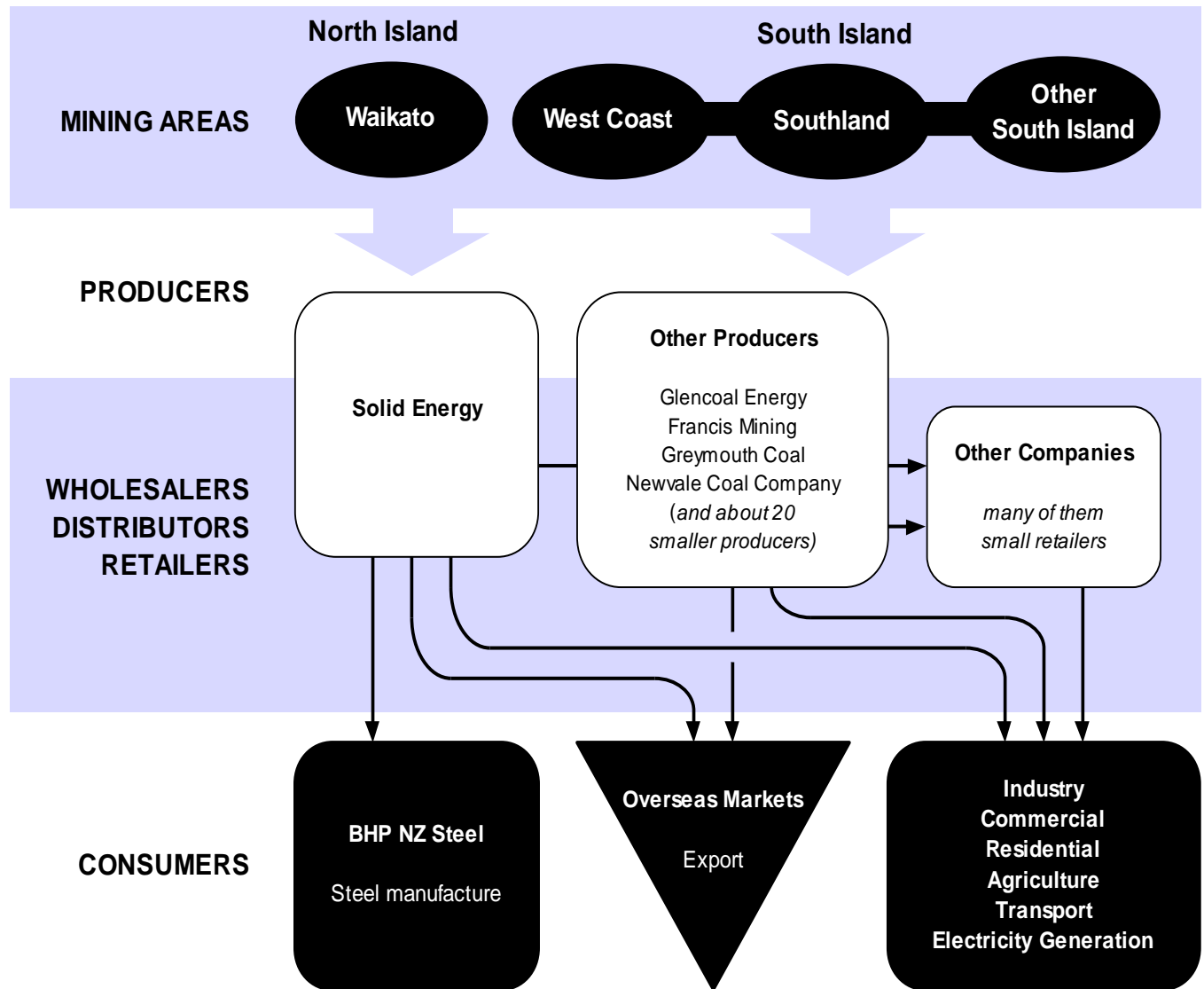




# C. Coal

Figure C.1: Coal Flow Summary for September Year 2002



Company names are listed without the suffixes "Limited" and "New Zealand Limited" where applicable.

## Overview of New Zealand's Coal Industry

### Resources

Coal resources in New Zealand are extensive and are present in four major coal production areas: Waikato in the North Island, and West Coast, Otago and Southland in the South Island.

Figure C.1 shows the coal ownership flows in New Zealand for the March year ending 2002.

Total in-ground coal resources are estimated at about 15 billion tonnes. Of this, 8.6 billion tonnes (made up of about 80% relatively low-grade lignite, 15% middle-grade sub-bituminous coal, and 5% high-grade bituminous coal) is judged to be economically recoverable. Of the economically recoverable resources, about 570 million tonnes or 7% is currently classified as "measured recoverable" reserves, meaning that it has been defined with some accuracy. About a third of these economically recoverable coal resources are in existing mines, while the remainder could be mined without extensive investigatory work. About 90% of the economically recoverable coal by weight, or 75% by energy content, is located in the South Island in the Nelson-Westland, Otago and Southland coal regions.

Little exploration for new reserves is currently occurring, with the industry concentrating on extending reserves within existing mining licence areas.

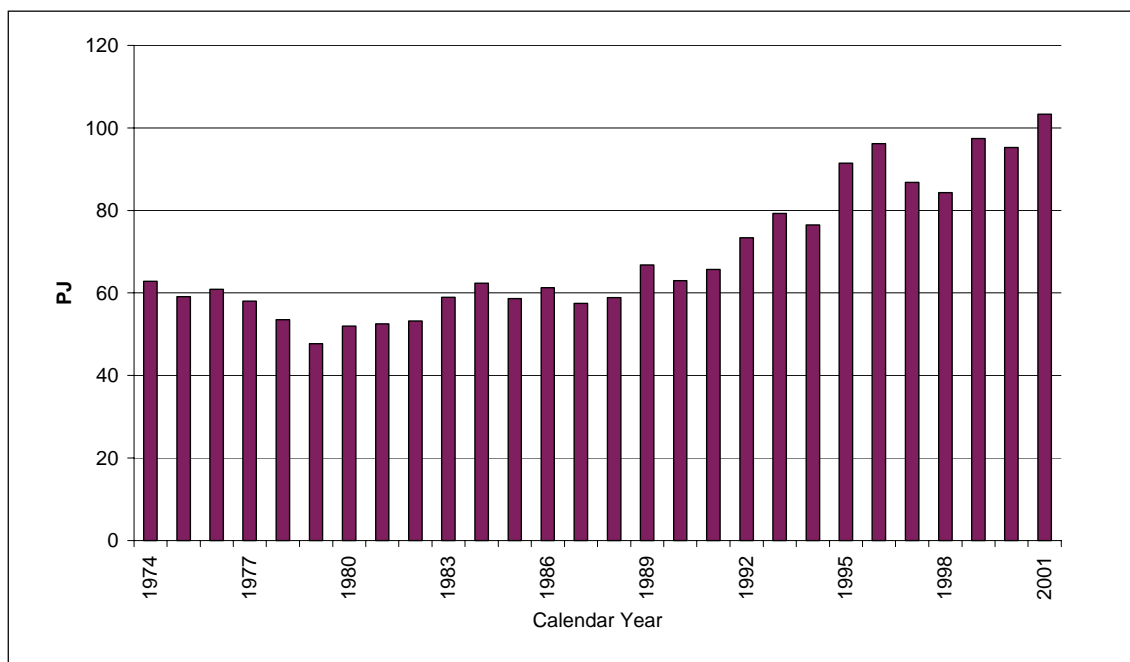
### Production

Coal production (statistics in Chart C.1a are for calendar years) export and consumption statistics in this commentary (and the latest data reported in Table C.1) apply to the **year ended September 2002** unless otherwise stated.

Coal production during the year ended September 2002 was about 13% higher (4.3 million tonnes or 114.3 PJ) than in 2001. Total consumption (including exports and for electricity generation) was up 10.0%, while exports of high-quality coal increased by 14%. About 60% of coal production by energy content, comprising lignite, sub-bituminous and bituminous ranks was produced in the South Island. Coal produced in the North Island, mostly from the Waikato region, is of sub-bituminous rank.

Solid Energy produces about 78% of New Zealand's coal from its 10 mines. Solid Energy's current "export mines" (Stockton and Strongman No.2 mines in the South Island) produce high quality bituminous coal suitable for overseas market requirements. It has other proposed "export mines" - the underground mines at Upper Seven Mile and Tararu and two opencast mines at Upper Waimangaroa.

**Chart C.1a: Total Coal Production**



## Export

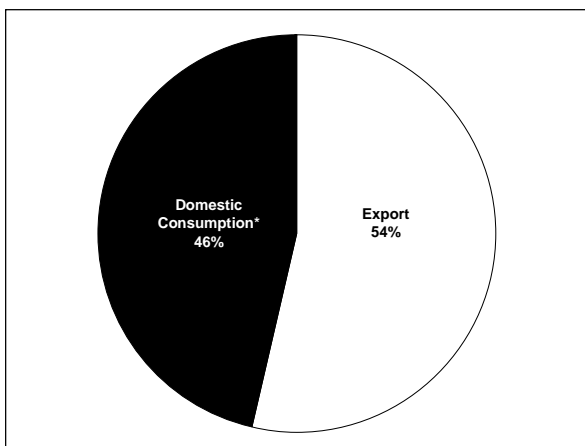
Export markets for premium grade New Zealand coal developed rapidly from 1991 to 1996 but declined from 1997 to 1998, as shown in Chart C.1c. This decline in export sales can be attributed to the weakening of the international steel and coal markets in those years. However, since 1999, coal exports have resumed a steady growth.

Solid Energy has maintained its presence in the overseas markets and the company expects to raise its export level to about 4 million tonnes per year over the next five years. More than 80% of Solid Energy’s exports are used for steelmaking in countries such as Japan, China, South Africa, Australia and India. The rest is sold for cement production and electricity generation in Chile and silicon metal or activated carbon production in northern Europe.

For the year ended September 2002, total coal exports were up 14% to 1.98 million tonnes, compared to 1.73 million tonnes during the same period in 2001 (Chart C.1c). During this period, coal exports accounted for 54% of total production (Chart C.1b).

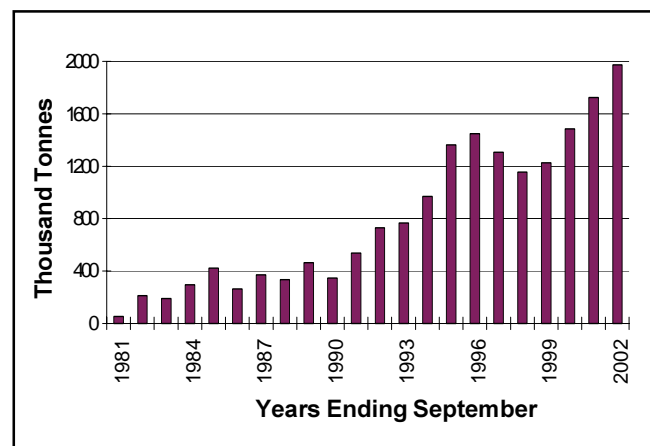
Global demand for coal is predicted to grow owing to the decline of oil and gas for fuel use during the next decade. The use of coal in global steel production is predicted to grow. This, together with the emerging “clean coal technologies” to meet climate change emissions requirement, will benefit export sales of good quality, low sulphur bituminous coal from New Zealand.

**Chart C.1b: Coal Export and Domestic Consumption September Year 2002**



\* Includes coal used for cogeneration and electricity generation.

**Chart C.1c: Coal Exports for September Years**



**Table C.1: Coal Production, Exports and Consumption**

		Gross PJ		Thousand Tonnes			
Calendar Year or Quarter		Total Production	Exports <sup>1</sup>	Total Consumption <sup>2</sup>	Total Production	Exports <sup>1</sup>	Total Consumption <sup>2</sup>
1974		62.80	n.a.	63.30	2564.3	n.a.	2582.0
1975		59.10	n.a.	58.00	2412.4	n.a.	2369.2
1976		60.90	n.a.	61.10	2486.9	n.a.	2493.0
1977		58.00	n.a.	57.30	2368.9	n.a.	2338.3
1978		53.50	n.a.	54.30	2182.5	n.a.	2215.2
1979		47.70	n.a.	52.10	1947.6	n.a.	2128.0
1980		51.97	2.91	51.10	2162.6	92.7	2085.0
1981		52.54	3.66	52.00	2196.9	116.7	2121.0
1982		53.21	5.29	55.10	2244.4	168.7	2249.1
1983		58.97	5.87	56.10	2473.5	187.3	2290.3
1984		62.34	11.68	57.70	2579.6	372.3	2354.4
1985		58.64	13.04	58.50	2390.0	415.8	2386.0
1986		61.24	8.84	50.90	2518.0	281.7	2077.9
1987		57.47	9.40	48.50	2402.0	299.7	1979.6
1988		58.84	11.44	52.80	2438.1	364.8	2152.9
1989		66.73	15.24	58.37	2713.0	485.7	2424.2
1990		63.01	10.53	60.60	2587.6	335.7	2509.4
1991		65.65	19.12	66.99	2684.2	609.4	2741.4
1992		73.40	24.15	76.90	2948.5	769.7	3148.6
1993		79.24	24.71	76.10	3098.6	787.6	3082.5
1994		76.48	32.74	81.28	2997.6	1043.6	3202.5
1995		91.50	42.71	91.63	3446.0	1333.8	3477.3
1996		96.21	50.90	98.92	3610.6	1589.5	3698.7
1997		86.85	38.90	90.71	3370.7	1243.6	3521.4
1998		84.53	34.18	80.17	3319.2	1092.8	3165.3
1999		91.65	42.27	88.29	3505.7	1332.7	3483.5
2000		95.27	48.48	91.05	3585.6	1528.5	3544.5
2001		103.35	56.85	109.56	3911.4	1792.4	4237.7
1998	Mar	20.38	8.14	19.33	803.2	260.3	766.2
	Jun	26.74	11.45	25.37	1045.5	366.1	997.2
	Sep	17.59	5.42	16.60	704.1	173.4	667.4
	Dec	19.82	9.17	18.87	766.5	293.0	734.6
1999	Mar	20.25	10.42	19.49	767.2	328.5	764.6
	Jun	28.46	14.42	27.30	1069.7	454.6	1060.4
	Sep	17.09	4.75	16.73	696.7	149.7	696.9
	Dec	25.85	12.68	24.78	972.1	399.9	961.5
2000	Mar	17.55	5.45	17.09	709.0	171.7	708.8
	Jun	23.90	11.64	22.89	904.4	367.0	896.5
	Sep	29.06	17.34	27.55	1061.4	546.6	1042.2
	Dec	24.75	14.06	23.52	910.8	443.2	897.0
2001	Mar	22.62	12.59	24.04	856.2	397.1	931.5
	Jun	27.99	17.16	29.72	1049.2	541.1	1140.6
	Sep	25.34	10.91	26.76	974.3	343.9	1048.3
	Dec	27.41	16.18	29.04	1031.7	510.3	1117.4
2002 <sup>3</sup>	Mar	23.48	11.50	21.58	882.3	362.7	838.9
	Jun	31.19	18.69	33.14	1,164.1	589.3	1,273.2
	Sep	32.28	16.27	30.70	1,203.4	513.1	1,188.1
<b>Years Ended</b>	<b>Sep 01</b>	<b>100.70</b>	<b>54.72</b>	<b>104.04</b>	<b>3,790.5</b>	<b>1,725.3</b>	<b>4,017.4</b>
	<b>Sep 02</b>	<b>114.35</b>	<b>62.64</b>	<b>114.46</b>	<b>4,281.5</b>	<b>1,975.3</b>	<b>4,417.6</b>

## Notes:

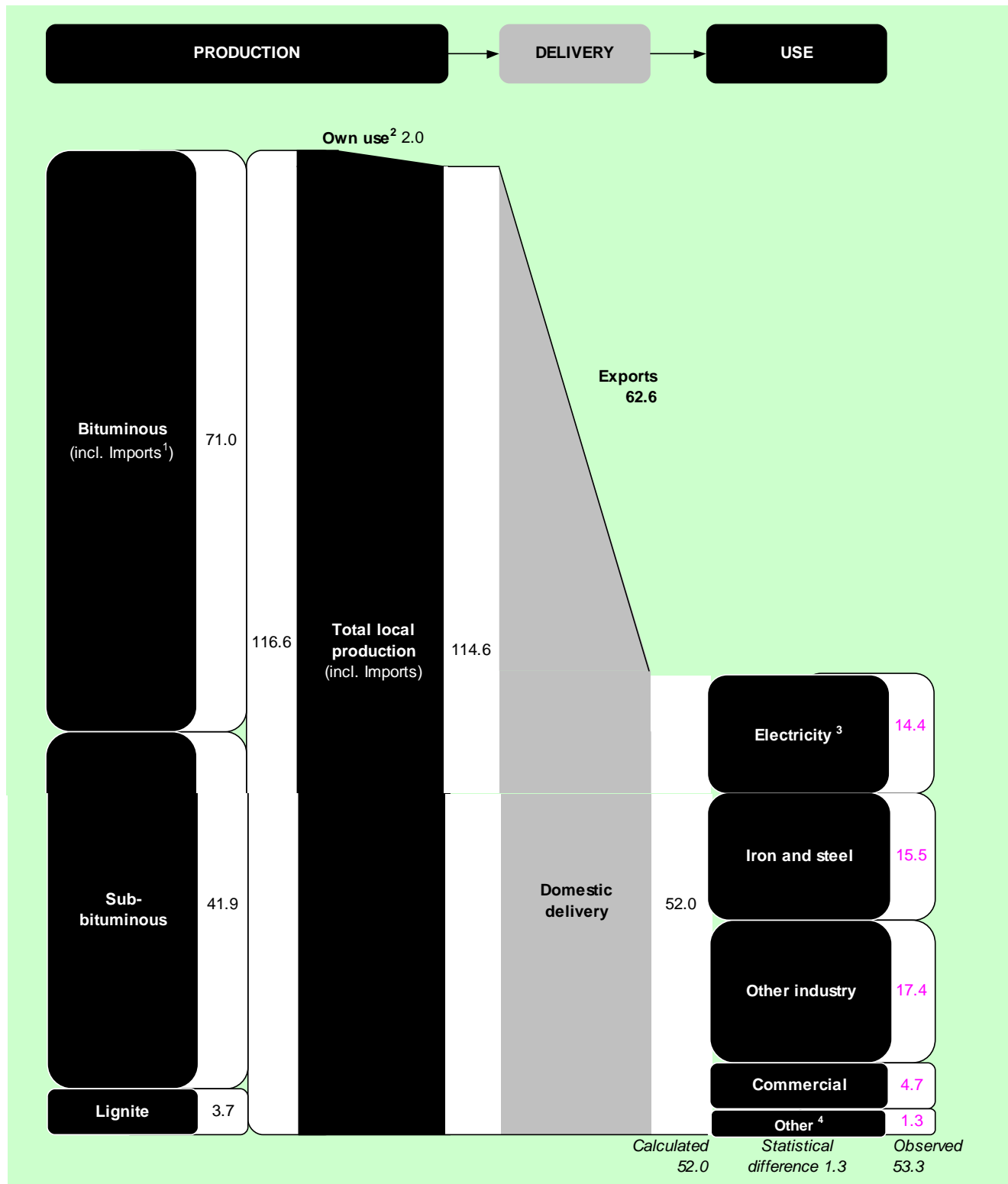
<sup>1</sup> Based on information obtained from Statistics New Zealand (INFOS database). Coal exports are mainly bituminous rank.

<sup>2</sup> This hybrid series includes exports, electricity generation (including cogeneration) and basic metals consumption. The difference between production and consumption (including exports) gives a change in stock levels.

<sup>3</sup> Production data for March, June and September quarters of 2002 have been provided by Statistics NZ.

## Figure C.2: Coal Flow Summary for September Year 2002

Petajoules (to approximate vertical scale)



**Notes:**

- <sup>1</sup> A small amount (about 2.3 PJ) of imported bituminous coal during this period.
- <sup>2</sup> "Own use" includes free use at mines and distribution losses.
- <sup>3</sup> Electricity generation includes cogeneration.
- <sup>4</sup> Residential, agriculture and transport.
- <sup>5</sup> Some totals may not add up due to rounding.

### End Use

During the year ended September 2002, about 46% (or 54 PJ) of coal production was used domestically, while the rest was exported. Chart C.4 shows that electricity generation (including cogeneration) accounted for 25.3% of observed domestic use, basic metals sector 28.5%, other industry 31.5%, commercial sector 8.7% while agriculture (mainly horticulture), transport and residential sectors used the remaining 6.1%. The “other industry” coal use was primarily in cement, lime and plaster, meat, dairy and other food processing, wool, timber, pulp and paper products. Commercial coal use was mainly heating for accommodation and service buildings in central and local government, hospitals, rest homes and educational institutions.

In the year ended September 2002, coal use for electricity generation (excluding cogeneration)

increased by 7% to 13.7 PJ from 12.8 PJ in the previous year but electricity generation from coal only accounted for about 3% of total generation.

Table C.2 shows coal consumption by sector for September years 2000 to 2002. It shows that coal consumption by the residential sector has been declining steadily and during 2002, there was a decrease of about 25% compared to the previous year. In the agricultural sector, consumption declined by 14% to 0.61 PJ compared to 0.71 PJ in the previous year while the industrial sector was fairly constant, at above 33 PJ. Commercial sector coal use decreased slightly as shown in Chart C.3. Coal used in transport has been assumed to be steady at 0.08 PJ over the years.

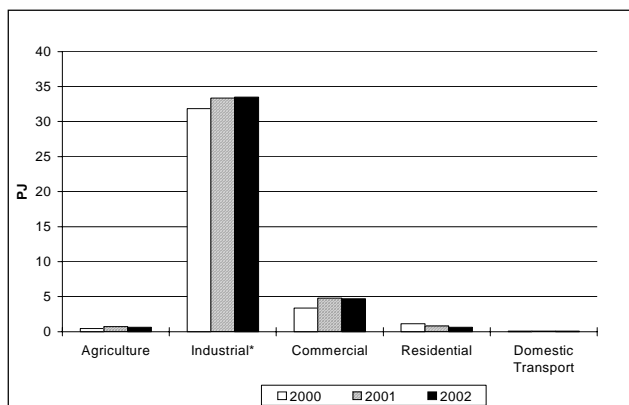
**Table C.2: Summary of Coal Consumption by Sector**

Sector	September Year (PJ)			September Year (%)		
	2000	2001	2002	2000	2001	2002
Agriculture	0.42	0.71	0.61	1.15	1.79	1.54
Industrial*	31.85	33.35	33.50	86.53	83.98	84.82
Commercial	3.35	4.76	4.70	9.09	11.99	11.91
Residential	1.11	0.81	0.60	3.01	2.04	1.53
Domestic Transport	0.08	0.08	0.08	0.22	0.20	0.20
<b>TOTALS**</b>	<b>36.81</b>	<b>39.72</b>	<b>39.50</b>	<b>100</b>	<b>100</b>	<b>100</b>

\* Includes cogeneration coal.

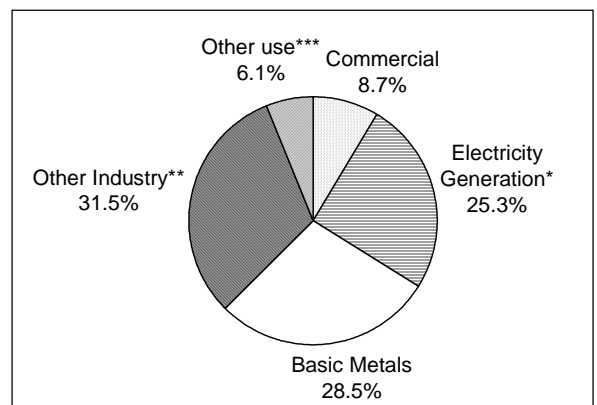
\*\* Totals do not include coal used for electricity generation (by non-cogeneration plants) and may not add up due to rounding.

**Chart C.3: Comparison of Coal Consumption by Sector for September Year 2002**



\* Includes cogeneration activities.

**Chart C.4: Domestic Coal End Use September Year 2002**



\* Includes cogeneration.

\*\* Includes unallocated manufacturing industries.

\*\*\* Includes agriculture, transport and residential.