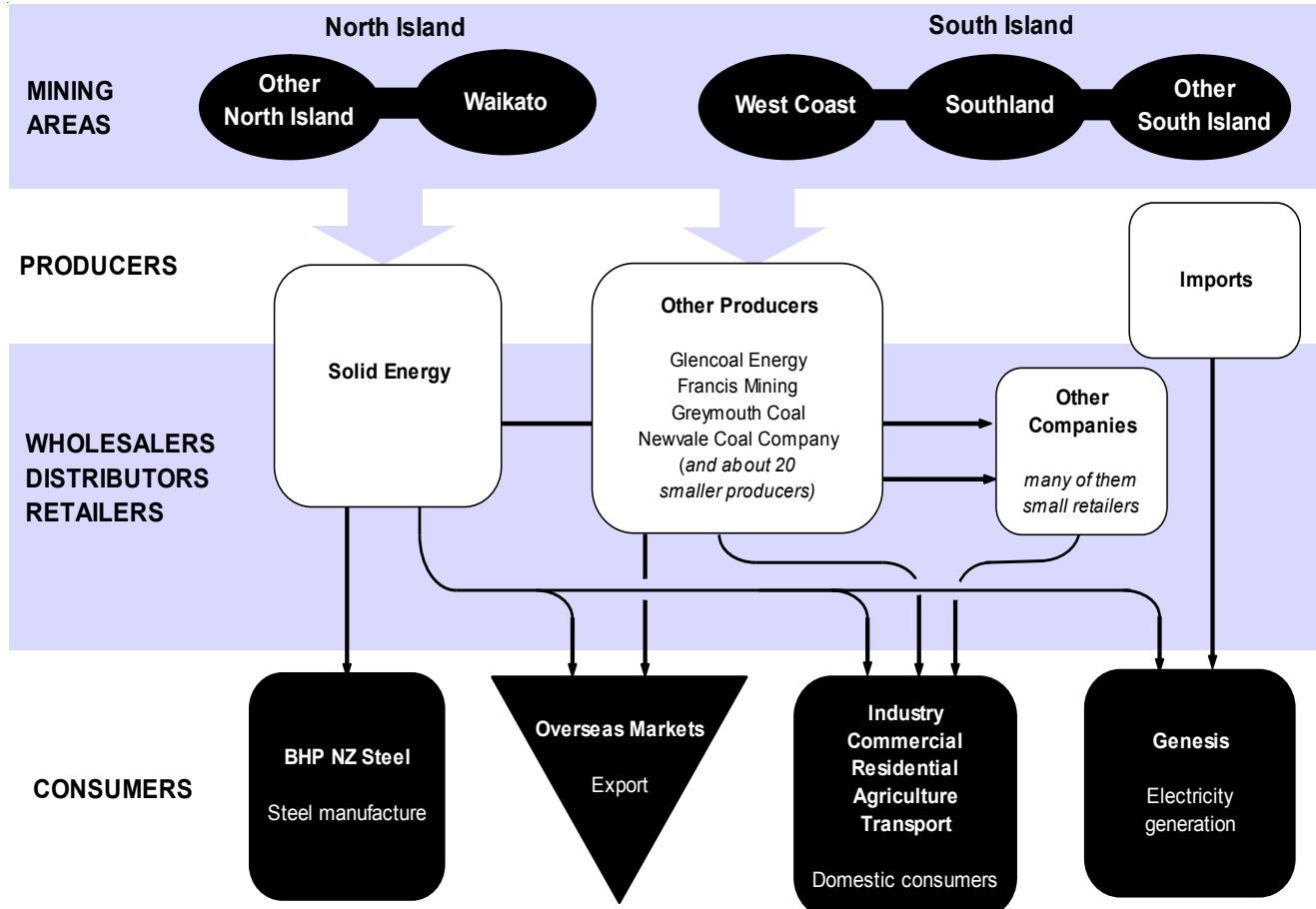




C. Coal

Figure C.1: Coal Flows for September Year 2004



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, with workable seams present in the Waikato and Taranaki regions in the North Island and in the Nelson, West Coast, Otago and Southland regions of the South Island.

A report done for the Ministry of Commerce in 1994 indicated that 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) was judged to be economically recoverable. Of the economically recoverable resources, about 570 million tonnes or 7% is currently classified as "measured recoverable" reserves.

Investigations have been conducted into evaluating the costs of opening old coal mines. This has been coupled with an increasing amount of coal prospecting, exploration and mining permits granted by Crown Minerals since the late 1990s. Five more coal exploration permits were issued to Kenham Holdings Ltd in Christchurch, while two were issued to Solid Energy – one to explore the Mangapei coalfield in the King Country and the other for a lignite coal deposit in Southland.

Figure C.1 shows the coal ownership flows in New Zealand for the year ending September 2004.

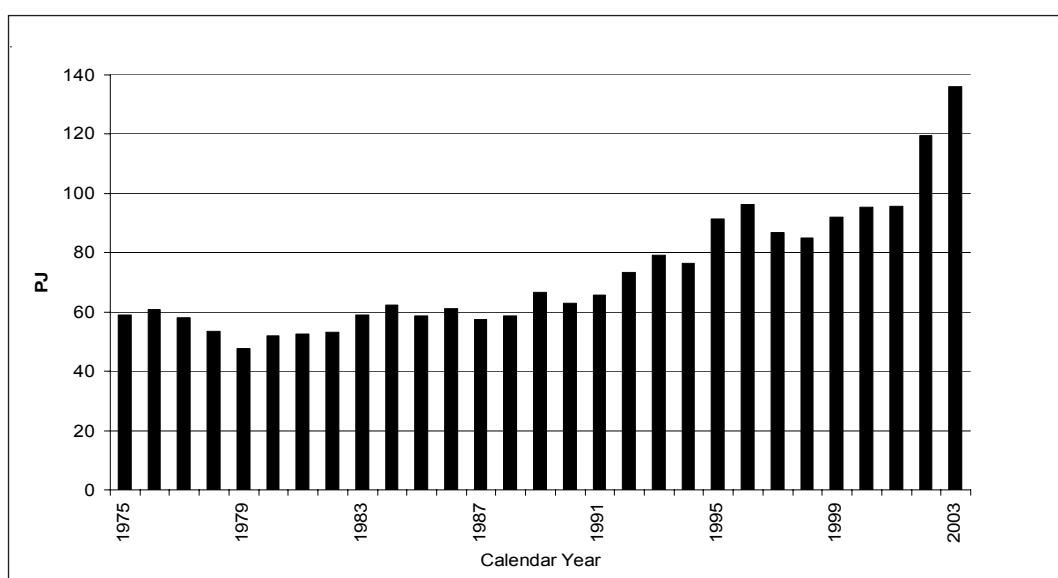
Production

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 2004** unless otherwise stated.

Coal production in the calendar year 2003 exceeded 5 million tonnes. Coal production has been increasing steadily since 1998 (Chart C.1a), largely driven by export growth (for bituminous coal) and the domestic commercial and industrial sectors. Solid Energy produces about 80% of total coal produced in New Zealand while the rest is produced by a number of smaller coal producers.

The demand for sub-bituminous coal has been increasing in New Zealand. However, production of sub-bituminous coal has not met this demand. Production of sub-bituminous coal fell by 8% in the September year 2004 – 2.4 million tonnes compared with 2.6 million tonnes in the previous period. To meet the high demand for sub-bituminous coal, especially its use as feed stock for electricity generation, about 758 thousand tonnes was imported from Indonesia during this period. Production of lignite during this period increased by about 13% to 275 thousand tonnes compared with the previous period at 244 thousand tonnes.

Chart C.1a: Total Coal Production



Export

Demand for coal internationally is predominantly related to steel production. New Zealand coal is valued internationally for its low ash and sulphur contents, its suitability for steel making and high heating value. Major international steel producers like Japan, India, South Africa, China, South America and Australia are New Zealand's main customers.

Export of premium grade coal has increased since 1999 with a record export level of 2.21 million tonnes in 2003. But during September year ended 2004, exports declined by 11% as shown in Chart C.1c. During this period, exports accounted for about 33% (60.4 PJ) of all the available coal (185.2 PJ) for exports and domestic consumption as shown in 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 as well. This, together with the emerging "clean coal technologies", to meet climate change emissions requirements, will benefit export sales of good quality, low sulphur bituminous coal from New Zealand.

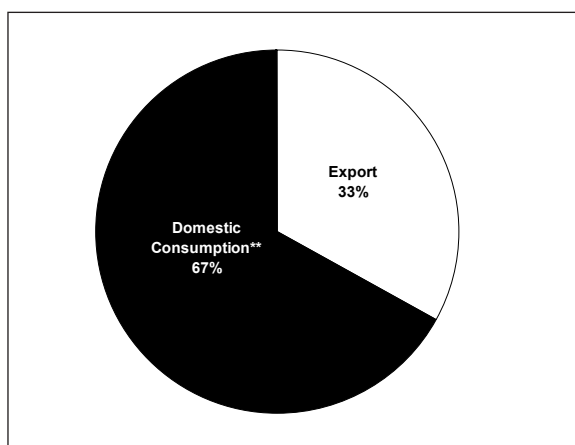
Consumption

Major domestic coal customers are mainly Pacific Steel, New Zealand Steel and Genesis for its Huntly Power Station. Other coal users are manufacturing industries, agriculture, transport and residential consumers.

Total domestic consumption (excluding exports) increased about 4% at 82.1 PJ for the year ended September 2004 compared to the previous year. Chart C.2 shows that electricity generation (including cogeneration) accounted for 49.8% of observed domestic use, the basic metals sector 20.7%, other industry 17.1%, and the commercial sector 8.3%, while the agriculture (mainly horticulture), transport and residential sectors used the remaining 4.2%. 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 2004, coal use for electricity generation (including cogeneration) increased by 35% to 40.9 PJ from 30.3 PJ in the previous year. However, electricity generation from coal only accounted for about 7% of total generation.

Chart C.1b: Coal Export and Domestic Consumption September Year 2004



* Includes coal used for cogeneration, electricity generation, losses and own use.

Chart C.1c: Coal Exports for September Years

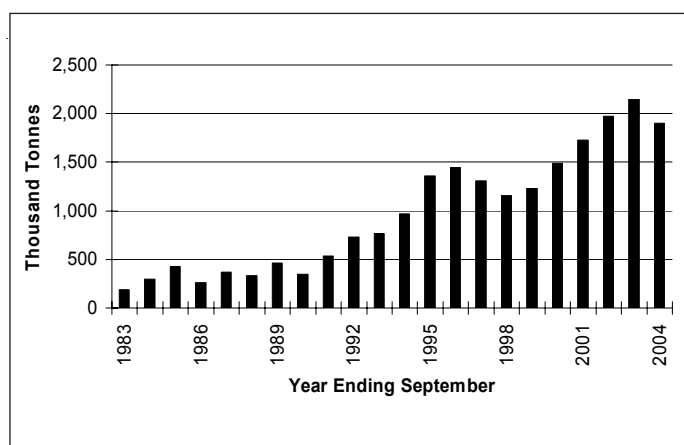


Table C.1: Coal Production, Exports and Consumption

		Gross PJ			Thousand Tonnes				
Calendar Year or Quarter	Total Production	Exports ¹	Imports ²	Total Consumption ³	Total Production	Exports ¹	Imports ²	Total Consumption ³	
1981	52.54	3.66	n.a	52.00	2,196.9	116.7	n.a.	2,121.0	
1982	53.21	5.29	n.a	55.10	2,244.4	168.7	n.a.	2,249.1	
1983	58.97	5.87	n.a	56.10	2,473.5	187.3	n.a.	2,290.3	
1984	62.34	11.68	n.a	57.70	2,579.6	372.3	n.a.	2,354.4	
1985	58.64	13.04	n.a	58.50	2,390.0	415.8	n.a.	2,386.0	
1986	61.24	8.84	n.a	50.90	2,518.0	281.7	n.a.	2,077.9	
1987	57.47	9.40	n.a	48.50	2,402.0	299.7	n.a.	1,979.6	
1988	58.84	11.44	n.a	52.80	2,438.1	364.8	n.a.	2,152.9	
1989	66.73	15.24	n.a	58.37	2,713.0	485.7	n.a.	2,424.2	
1990	63.01	10.53	n.a	60.60	2,587.6	335.7	n.a.	2,509.4	
1991	65.65	19.12	n.a	66.99	2,684.2	609.4	n.a.	2,741.4	
1992	73.40	24.15	n.a	76.90	2,948.5	769.7	n.a.	3,148.6	
1993	79.24	24.71	0.02	76.10	3,098.6	787.6	0.5	3,082.5	
1994	76.48	32.74	0.02	81.28	2,997.6	1,043.6	0.6	3,202.5	
1995	91.50	42.71	0.00	91.63	3,446.0	1,333.8	0.1	3,477.3	
1996	96.21	50.90	0.00	98.92	3,610.6	1,589.5	0.1	3,698.7	
1997	86.85	38.90	0.00	90.71	3,370.7	1,243.6	0.0	3,521.4	
1998	84.85	34.18	0.00	81.38	3,319.2	1,092.8	0.1	3,165.3	
1999	92.13	42.27	0.00	90.66	3,505.7	1,332.7	0.0	3,482.4	
2000	95.60	48.48	0.48	93.80	3,585.6	1,528.5	16.2	3,544.6	
2001	103.57	56.85	0.91	112.79	3,911.4	1,792.4	30.6	4,237.7	
2002	119.32	61.27	2.29	116.83	4,458.9	1,931.7	76.5	4,382.5	
2003	136.16	69.82	11.93	145.94	5,179.9	2,210.1	421.7	5,559.3	
2000	Mar	17.41	5.45	0.00	17.40	703.6	171.7	0.0	708.8
	Jun	23.86	11.64	0.00	23.55	901.2	367.0	0.0	896.5
	Sep	29.42	17.34	0.24	28.54	1,068.2	546.6	8.1	1,042.2
	Dec	24.91	14.06	0.24	24.32	912.6	443.2	8.1	897.0
2001	Mar	22.63	12.59	0.00	24.75	855.0	397.1	0.0	931.5
	Jun	28.33	17.16	0.02	30.70	1,057.1	541.1	0.8	1,140.6
	Sep	24.88	10.91	0.25	27.38	960.4	343.9	8.4	1,048.3
	Dec	27.72	16.18	0.64	29.96	1,038.8	510.2	21.3	1,117.3
2002	Mar	23.05	11.50	0.75	23.31	863.0	362.6	25.2	874.8
	Jun	35.10	18.69	0.00	34.20	1,301.7	589.3	0.0	1,273.2
	Sep	30.23	16.27	0.75	29.40	1,116.5	513.0	25.2	1,089.4
	Dec	30.94	14.80	0.78	29.91	1,177.7	466.8	26.1	1,145.1
2003	Mar	33.89	17.43	1.12	36.58	1,289.5	551.8	32.5	1,393.0
	Jun	34.88	19.69	1.92	37.33	1,303.6	623.3	65.6	1,398.2
	Sep	35.75	15.81	3.87	39.11	1,383.6	500.6	121.9	1,509.3
	Dec	31.65	16.88	5.01	32.93	1,203.3	534.4	201.7	1,258.8
2004 ⁴	Mar	29.45	11.99	3.99	28.79	1,107.2	381.4	169.3	1,142.4
	Jun	33.42	14.50	5.62	37.80	1,314.2	461.2	250.8	1,502.8
	Sep	35.83	16.38	5.13	49.85	1,342.5	521.2	219.8	2,011.9
Years Ended Sep 2003⁵		135.45	67.74	7.69	142.92	5,154.4	2,142.4	246.1	5,445.6
Ended Sep 2004⁵		130.35	59.75	19.76	149.36	4,967.1	1,898.3	841.6	5,915.9

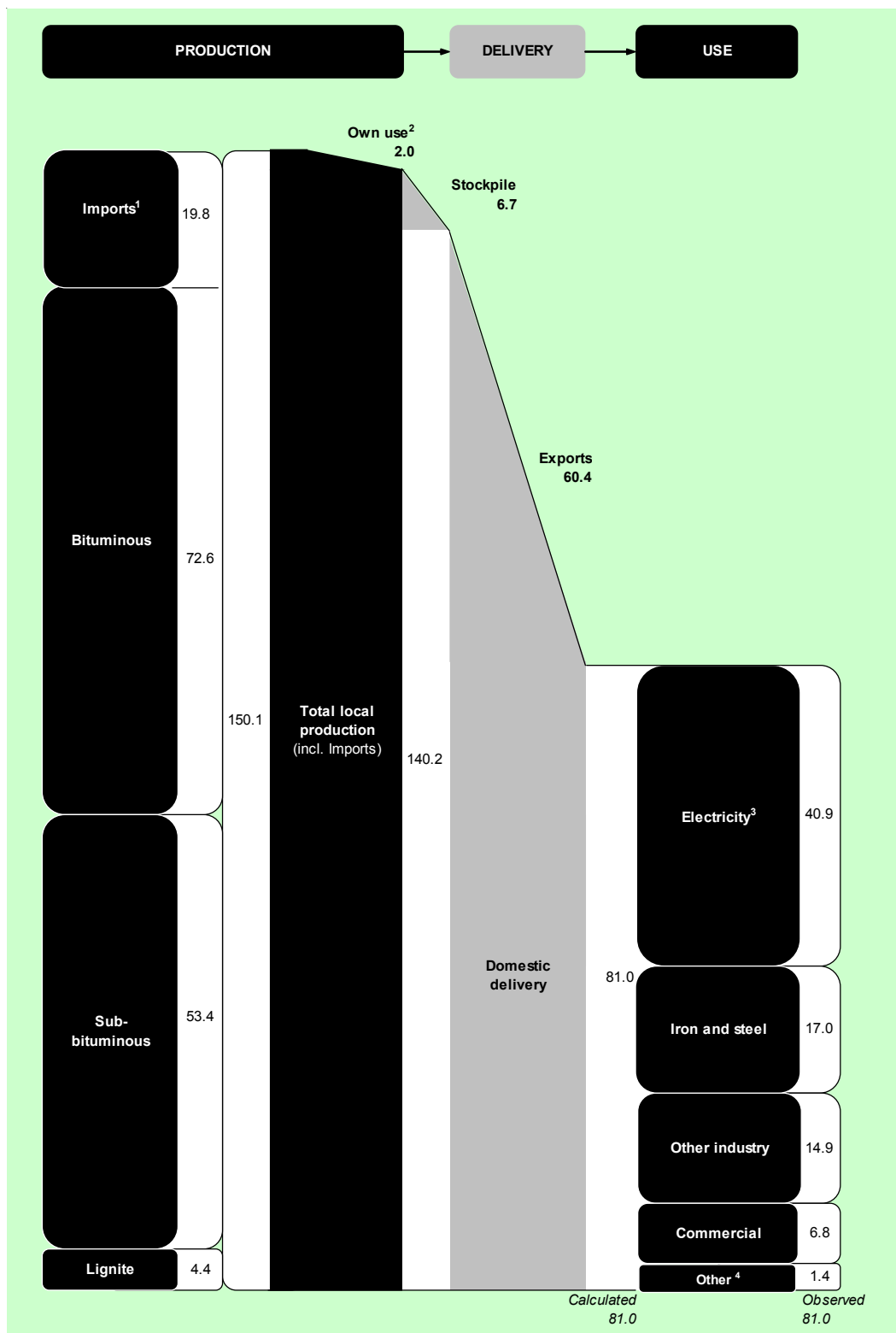
n.a. = not available.

Notes:

¹ Based on information obtained from Statistics New Zealand (INFOS database). Coal exports are mainly bituminous rank.² The import series (mainly bituminous and sub-bituminous coal) exclude peat and coke.³ 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.⁴ Production data for the March, June and September quarters of 2004 were provided by Statistics New Zealand.⁵ Production totals do not include imports of bituminous and sub-bituminous coal that were included in consumption.

Figure C.2: Coal Flow Summary for September Year 2004

Petajoules (to approximate vertical scale)



Notes:

- ¹ About 2.74 PJ of bituminous and 17.02 PJ of sub-bituminous coal was imported during this period.
- ² "Own use" includes free use at mines and distribution losses.
- ³ Electricity generation includes cogeneration.
- ⁴ Residential, agriculture and transport.
- ⁵ Some totals may not add up due to rounding.

Table C.2 shows coal consumption by sector for September years 2002 to 2004. It shows a steady consumption level by the residential sector with an increase of about 3% in 2004 compared with the previous year. Agricultural sector consumption decreased by about 8% to 0.51 PJ compared with 0.56 PJ in the previous year. Coal use in the commercial sector increased significantly by 64% but decreased by 24% in the industrial sector as shown in Chart C.3. Coal used in transport has been assumed to be steady at 0.08 PJ over the years.

Clean Coal Technology (CCT)

Clean Coal Technologies – the products of research and development conducted over the past 20 years in the USA – have resulted in many new lower-cost, more efficient and environmentally compatible technologies for electric utilities, steel mills, cement plants and other industries.

Most advances in clean coal technologies have occurred in two main areas:

- advanced pollution control systems to reduce sulphur dioxide (SO₂) and nitrogen oxide (NOx) emissions; and
- more efficient advanced power generation systems for new coal-based power plants that will power the USA in the decades to come.

In February 2003, the US Department of Energy announced a plan to build a \$1 billion project called “FutureGen” that will lead to the world’s first emission-free plant to produce electricity and hydrogen from coal while capturing greenhouse gas emissions. These emissions will then be injected in deep underground geologic reservoirs, where they will be permanently isolated, or sequestered, from the atmosphere.

Table C.2: Summary of Coal Consumption by Sector

Sector	September Year (PJ)			September Year (%)		
	2002	2003	2004	2002	2003	2004
Agriculture	0.61	0.56	0.51	1.55	1.17	1.28
Industrial*	33.50	41.86	31.89	84.81	88.25	79.53
Commercial	4.70	4.13	6.79	11.91	8.71	16.93
Residential	0.60	0.80	0.83	1.53	1.69	2.06
Domestic Transport	0.08	0.08	0.08	0.20	0.17	0.20
TOTAL	39.50	47.43	40.10	100.00	100.00	100.00

* 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.2: Comparison of Coal Consumption by Sector for September Years

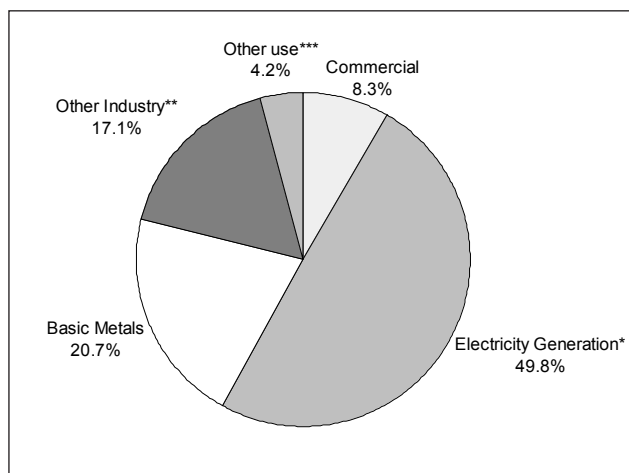
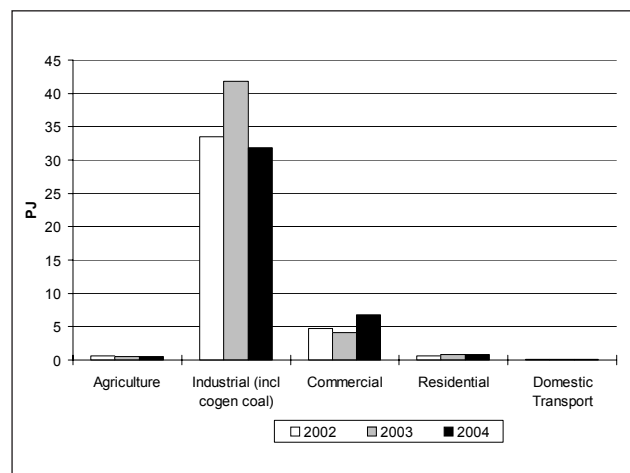


Chart C.3: Domestic Coal End Use September Year 2004



* Includes cogeneration.

** Includes unallocated manufacturing industries.

*** Includes agriculture, transport and residential.