

MINERALS AND ENERGY

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MINERALS AND MINING have an important, if uneven, role in Australian history. The extraction of metallic minerals has been an important component of economic activity in Australia since the 1840s, when copper production started in South Australia. Since then, the mineral industry as a whole (including the coal industry) has passed through three major stages. The first of these lasted until about 1910, the second from then until the end of World War II, and the third from that time to the present. Throughout all three stages, the greater part of production of all metallic minerals, with the exception of iron and manganese, has been exported.

During the first stage of the history of the Australian mineral industry, gold was the mineral of pre-eminent importance; it accounted for over half the total value of mineral production in almost every year. The two periods of peak production were the 1880s, when initial exploitation of the Victorian goldfields took place, and the first decade of the twentieth century, when the Western Australian goldfields were at their most productive. At various times all other states and the Northern Territory, with the exception of South Australia, have also produced significant quantities of gold. The mining of copper, tin, lead, zinc and silver minerals also became important during this first stage, with the discovery of the Broken Hill silver, lead and zinc deposit in 1883 being of particular significance.

During the second stage of the industry's history, the quantity and value of production of most minerals ceased growing or declined, with consequent stagnation and decline in the total value of mineral production. The only major new mineral industry to develop was iron-ore mining and iron and steel production, mainly to supply domestic requirements. After a number of false starts during the preceding decades, this industry was established at Lithgow in New South Wales in the early years of the twentieth century. In 1928 the Lithgow company transferred its activities to Port Kembla and in 1935 it was taken over by BHP, which had opened its integrated steelworks at Newcastle in 1915.

Since the end of World War II, the volume and value of mineral production and exports have grown very rapidly. It should be noted that the statistics of value of exports includes the added value of exports of primary metals, including pig iron and steel, whereas the value of mineral production is ex-mine only. This means that exports in fact account for a somewhat lower share of the total value of production than might appear from comparison of the two data series. The

growth in recent decades has been associated in part with a resurgence in production of already established minerals, of which the Mount Isa copper, lead and silver mine has been of particular importance. However, much of the growth has come from diversification of the range of mineral commodities produced. These include bauxite, alumina and aluminium metal, as well as rutile, ilmenite and zircon, all three of which are mined from beach sands, and uranium. Major discoveries of iron ore and nickel provided the basis of exports which since the beginning of the 1970s have greatly exceeded domestic consumption, and the same is true of manganese.

In contrast with metallic minerals, Australian production of energy minerals has mainly supplied the domestic market. Apart from building stone, coal was the first mineral produced by European settlers in Australia, mining having started at Newcastle in 1804. The first stage of the industry's history saw the establishment of coal exports from New South Wales to other colonies and later to international markets and the start of coal production in other colonies, though only Queensland achieved self-sufficiency. During the second stage the black coal industry entered a protracted period of stagnation and in the 1920s Australia became a net importer of energy, as the energy content of petroleum imports exceeded that of coal exports. However, the commercial exploitation of brown coal for electricity production started in Victoria in the 1920s. The revival of the coal industry from the 1950s centred first on the rapid growth in domestic demand for coal by the electricity supply industry and from the 1960s on a new export trade in coking coal, supplied mainly by large new mines in Queensland, and was further boosted in the late 1970s by growth in the international demand for steaming coal. During this period Australia became a net energy exporter again. In 1985 Australia became the largest coal exporting country in the world, though by no means the largest producer.

For a hundred years from 1861, oil shale, intermittently exploited mainly in New South Wales, was the only domestic source of petroleum products. For most of this period domestic demand for petroleum products was met by imports of refined products, but from 1953 crude oil imports increased rapidly and product imports declined, reflecting the construction of large scale oil refineries in Australia. Persistent efforts to discover reserves of conventional crude oil were rewarded with a number of discoveries in the 1960s. The fields in Bass Strait, off the coast of Victoria, are by far the most important and have yielded over 90 per cent of the crude oil so far produced in Australia. Imports of crude oil fell dramatically following the start of production from Bass Strait in 1970. Since 1970 crude oil has made the largest and the most rapidly growing contribution to the total value of mineral production. The 1960s and early 1970s also saw the discovery in a number of locations of extensive reserves of natural gas, most of which were quickly developed for production and sale, by means of pipelines connecting the gas fields to major cities and regional centres. Bass Strait is the main source of liquefied petroleum gas.

Production of gas from coal for public supply began in Sydney in 1837 and gradually spread to other towns and cities over the following five decades. Mainly because of its cost, such town gas never made a large contribution to energy consumption and in the 1970s it was almost completely displaced by natural gas. Although the first public electricity supply began in the 1880s, it was not until after the World War II that the electricity industry grew rapidly. It is now the largest of the energy industries in terms of capital invested, value added and employment. Coal-fired steam power stations have always been the main source of electricity generated in Australia. Natural gas is also used to fire steam plants in Victoria, South Australia and Western Australia. Hydro generation is mainly confined to Tasmania, the mountain areas of Victoria and New South Wales and far north Queensland; there is limited scope for further expansion.

It is clear that the supply of primary fuels for use in Australia has grown steadily throughout the twentieth century, with the notable exception of the period of the Great Depression. However, it should be noted that the omission of fuel wood and bagasse from the statistics prior to 1945 has the effect of exaggerating the apparent rate of growth of primary energy supply. The main features of the series are the declining relative importance of black coal and the more rapid growth in the use of petroleum and, in recent years, natural gas. This reflects the replacement of coal as a fuel in industry, the home, the railways and the manufacture of town gas in addition to the expansion of road and air transport fuelled by petroleum. Growth in petroleum use may have almost ceased, but natural gas use continues to grow strongly.

ME 1-6 GOLD PRODUCTION, COLONIES AND STATES 1851-1982

Year 31 Dec	NSW	Vic	Qld	WA	Other ^a	Aust
	1	2	3	4	5	6
	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes
1851	3.43	6.52				9.95
1852	19.48	66.97				86.46
1853	13.98	80.37				94.35
1854	5.66	64.98				70.64
1855	4.79	82.58				87.37
1856	5.05	89.44			0.01	94.50
1857	4.94	82.90			0.01	87.84
1858	8.09	76.04			0.01	84.13
1859	9.22	68.79	0.02		0.00	78.04
1860	10.73	65.14	0.09		0.00	75.96
1861	13.23	59.61	0.03		0.00	72.86
1862	18.07	50.68	0.00		0.00	68.75
1863	13.15	49.64	0.11		0.00	62.90
1864	9.56	47.52	0.61		0.00	57.69
1865	9.02	47.20	0.68		0.00	56.90
1866	8.17	45.31	0.63		0.01	54.12
1867	7.71	43.98	1.39		0.03	53.11
1868	7.28	49.35	4.35		0.02	61.00
1869	7.13	45.25	3.83		0.00	56.21
1870	6.82	38.20	3.58		0.03	48.63
1871	9.16	40.10	4.52		0.17	53.94
1872	12.04	39.00	4.84		0.20	56.07
1873	10.22	34.28	5.25		0.13	49.89
1874	7.63	32.15	9.93		0.14	49.84
1875	6.43	31.29	10.97		0.09	48.78
1876	4.49	28.23	10.53		0.40	43.65
1877	3.45	23.71	9.65		0.17	36.98
1878	3.15	22.20	8.42		0.74	34.51
1879	2.98	22.23	7.57		1.69	34.48
1880	3.25	24.28	6.92		2.05	36.51
1881	4.20	24.41	7.01		2.41	38.04
1882	3.86	25.32	5.75		2.00	36.93
1883	3.36	22.85	5.40		1.93	33.54
1884	2.90	22.81	7.78		1.86	35.34
1885	2.77	21.53	7.78		1.79	33.87
1886	2.68	19.48	8.69	0.01	1.56	32.43
1887	2.89	18.09	10.85	0.14	5.30	37.27
1888	2.32	18.31	12.38	0.10	1.58	34.69
1889	3.18	18.01	19.74	0.43	1.50	42.86
1890	3.37	17.24	15.98	0.63	1.30	38.52
1891	4.09	16.88	14.87	0.84	1.99	38.68
1892	4.21	19.17	15.85	1.66	2.15	43.04
1893	4.77	19.66	15.87	3.09	1.92	45.30
1894	8.47	21.00	17.06	5.76	2.64	54.93
1895	9.64	21.68	15.75	6.44	2.45	55.95
1896	7.86	23.58	15.62	7.83	2.44	57.32
1897	8.09	23.81	18.69	18.78	3.05	72.42
1898	8.80	24.52	20.14	29.22	2.83	85.52
1899	11.89	25.03	20.78	45.74	2.98	106.42
1900	7.84	23.65	21.03	43.99	2.92	99.43
1901	5.40	22.72	18.61	52.98	2.93	102.64
1902	5.02	22.42	19.92	58.20	2.91	108.46
1903	7.91	23.87	20.79	64.22	2.58	119.37
1904	8.39	23.81	19.88	61.69	2.92	116.69
1905	8.53	23.24	18.43	60.82	3.00	114.02
1906	7.90	24.02	16.94	55.82	2.42	107.10
1907	7.69	21.63	14.49	52.80	2.34	98.96
1908	6.99	20.88	14.47	51.26	2.04	95.63
1909	6.37	20.35	14.17	49.62	1.84	92.35
1910	5.87	17.74	13.73	45.74	1.54	84.63
1911	5.63	15.68	12.01	42.64	1.30	77.26
1912	5.14	14.93	10.82	39.90	1.55	72.34
1913	4.65	13.53	8.27	40.76	1.34	68.66
1914	3.87	12.85	7.76	38.55	1.09	63.92
1915	4.12	10.24	7.77	37.64	0.79	60.56
1916	3.36	7.98	6.69	33.01	0.76	51.81

Year 31 Dec	NSW	Vic	Qld	WA	Other ^a	Aust
	1	2	3	4	5	6
	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes
1917	2.56	6.28	5.58	30.18	0.70	45.29
1918	2.71	4.94	4.15	27.26	0.54	39.60
1919	2.05	4.21	3.76	22.83	0.36	33.22
1920	1.52	4.75	3.58	19.22	0.28	29.35
1921	1.59	3.25	1.26	17.22	0.26	23.58
1922	0.78	3.32	2.51	16.74	0.14	23.50
1923	0.59	2.97	2.76	15.69	0.15	22.15
1924	0.58	2.09	3.07	15.09	0.19	21.02
1925	0.60	1.47	1.44	13.72	0.15	17.39
1926	0.60	1.53	0.32	13.60	0.16	16.21
1927	0.56	1.20	1.18	12.70	0.17	15.81
1928	0.40	1.06	0.41	12.24	0.13	14.24
1929	0.23	0.82	0.29	11.73	0.21	13.29
1930	0.39	0.75	0.24	12.99	0.18	14.55
1931	0.61	1.36	0.41	15.88	0.25	18.51
1932	0.87	1.49	0.72	18.84	0.30	22.21
1933	0.91	1.81	2.86	19.82	0.42	25.82
1934	1.12	2.18	3.59	20.26	0.42	27.58
1935	1.56	2.72	3.20	20.19	0.65	28.32
1936	1.89	3.66	3.77	26.32	1.06	36.69
1937	2.13	4.53	3.96	31.12	1.34	43.09
1938	2.76	4.49	4.71	36.32	1.24	49.52
1939	2.71	4.87	4.58	37.77	1.26	51.19
1940	3.12	5.62	3.94	37.06	1.40	51.13
1941	2.74	4.66	3.39	34.50	1.26	46.55
1942	2.40	3.16	2.96	26.38	0.99	35.89
1943	1.98	1.76	1.95	17.00	0.67	23.37
1944	1.95	1.68	1.59	14.50	0.71	20.43
1945	1.34	1.92	1.97	14.57	0.64	20.44
1946	1.00	2.71	1.95	19.19	0.80	25.64
1947	1.56	2.63	2.25	21.89	0.83	29.16
1948	1.62	2.13	2.17	20.68	0.94	27.54
1949	1.61	2.13	2.37	20.17	1.38	27.65
1950	1.60	2.11	2.74	18.98	1.61	27.05
1951	1.52	2.05	2.44	20.16	1.67	27.85
1952	1.21	2.11	2.67	22.63	1.88	30.50
1953	0.82	1.99	2.86	25.60	2.17	33.44
1954	0.98	1.64	3.05	26.81	2.29	34.77
1955	0.94	1.18	2.00	25.95	2.56	32.63
1956	0.90	1.21	1.74	25.30	2.88	32.03
1957	0.97	1.42	1.97	26.43	2.92	33.71
1958	0.58	1.29	2.32	27.21	2.94	34.34
1959	0.41	1.08	2.85	26.78	2.63	33.75
1960	0.42	0.89	2.43	27.06	2.99	33.80
1961	0.37	0.82	2.02	27.08	3.19	33.48
1962	0.35	0.88	2.11	26.75	3.16	33.24
1963	0.35	0.77	2.13	24.97	3.62	31.85
1964	0.33	0.66	3.14	22.25	3.59	29.98
1965	0.30	0.60	2.39	20.42	3.59	27.30
1966	0.28	0.65	4.33	19.50	3.75	28.52
1967	0.33	0.34	2.97	17.85	3.55	25.05
1968	0.27	0.32	2.58	16.09	5.23	24.49
1969	0.33	0.27	2.24	13.72	5.28	21.83
1970	0.33	0.25	2.59	10.90	5.22	19.28
1971	0.31	0.12	2.83	10.33	6.93	20.92
1972	0.31	0.21	2.24	10.47	10.13	23.36
1973	0.30	0.10	1.39	8.59	6.80	17.17
1974	0.28	0.13	1.98	6.58	6.97	15.94
1975	0.39	0.22	1.40	7.11	8.28	16.39
1976	0.50	0.06	1.44	7.48	6.16	15.64
1977	0.43	0.01	1.08	10.76	7.14	19.42
1978	0.42	0.01	0.61	13.33	5.77	20.14
1979	0.47	0.02	0.52	11.58	5.97	18.57
1980	0.57	0.04	0.68	11.23	4.52	17.04
1981	0.59	0.08	1.51	11.71	4.48	18.37
1982	0.58	0.10	0.16	20.85	5.13	26.96

(a) SA, Tas and NT.

ME 7-12 PRODUCTION OF COPPER, TIN, LEAD, ZINC, SILVER AND TUNGSTEN CONCENTRATE, AUSTRALIA 1842-1983

Year 31 Dec	Copper ^a	Tin ^a	Lead ^a	Zinc ^a	Silver ^a	Tung- sten ^b
	7	8	9	10	11	12
	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes	kg	tonnes
1842	0.0*					
1843	0.0*					
1844	0.1					
1845	0.2					
1846	1.6					
1847	2.3					
1848	4.1					
1849	2.6					
1850	4.8					
1851	4.1					
1852	4.6					
1853	1.9					
1854	1.2					
1855	1.4					
1856	3.7					
1857	4.3					
1858	3.5					
1859	3.9					
1860	4.5					
1861	4.8					
1862	6.1					
1863	6.9					
1864	9.3					
1865	8.1					
1866	12.4					
1867	15.7					
1868	17.2					
1869	14.3					
1870	9.4					
1871	10.7					
1872	11.4	1.0				
1873	11.8	8.2				
1874	11.1	5.7				
1875	11.3	8.0				
1876	10.7	9.6				
1877	12.2	8.2				
1878	9.2	9.7				
1879	8.9	9.8				
1880	9.0	10.6				
1881	11.2	12.0				
1882	12.3	12.1				
1883	14.0	11.4				
1884	17.9	9.9				
1885	14.2	10.0				
1886	10.9	8.9				
1887	9.2	9.1				
1888	9.0	8.1				
1889	7.7	8.3		0.5		
1890	7.1	7.2		0.1		
1891	7.6	6.6		0.1		
1892	6.7	6.7		0.2		
1893	6.1	6.7		0.1		
1894	8.6	6.9		0.0*		106
1895	9.6	5.4		0.0*		25
1896	10.0	5.3		0.0*		3
1897	15.9	4.5		10.3		13
1898	16.0	3.6		14.0		89
1899	22.3	4.3		17.9		367
1900	23.1	3.8		7.3	4948.3 ^c	299
1901	29.9	4.1		0.2	388.0	99
1902	29.1	4.7	1925.9 ^d	0.0*	344.5	59
1903	28.1	6.7	140.0	7.4	276.9	227
1904	26.9	6.7	185.1	22.4	354.0	1719
1905	31.3	7.7	192.1	42.1	339.7	1744
1906	37.5	9.3	167.3	41.7	295.6	1183
1907	41.3	9.9	223.4	96.0	407.7	1181
1908	40.3	9.2	199.2	112.1	409.7 ^e	798
1909	39.0	8.0	188.7	152.0	365.2	1083
1910	42.8	7.0	202.6	209.2	429.7	1391
1911	46.1	7.3	225.3	241.9	473.3	1233
1912	46.8	7.4	256.3	232.7	442.1	1176
1913	47.3	8.0	258.7	219.6	474.3	804
1914	38.4	5.3	203.2	168.4	427.5	709
1915	39.3	5.6	164.8	133.6	230.0	862
1916	40.3	5.6	150.4	120.6	263.8	1063
1917	39.5	5.1	167.5	160.1	277.5	1245
1918	39.2	4.8	200.4	184.7	217.4 ^f	1231
1919	19.6	4.7	67.3	66.4	218.4	1213
1920	26.9	4.5	18.7	10.2	52.1	463
1921	11.2	2.8	82.3	141.7	151.8	31
1922	13.1	2.4	154.1	198.7	344.9	23
1923	18.3	2.9	167.7	145.5	412.4	100
1924	14.4	3.3	153.3	112.9	318.7	65
1925	12.0	3.1	189.6	144.3	323.5	189
1926	9.5	3.2	184.3	151.4	335.2	85
1927	11.2	3.0	199.3	172.5	345.2	157
1928	10.8	3.1	178.2	149.1	281.8	206
1929	14.4	2.4	194.9	155.5	292.7	198
1930	14.5	1.5	196.4	122.5	296.7	66
1931	13.9	1.7	150.8	75.4	253.9	94
1932	15.1	2.0	212.5	116.5	276.8	32
1933	15.1	2.7	224.4	125.7	343.0	160
1934	12.7	2.9	231.9	138.9	335.9	384
1935	17.6	3.1	224.7	148.4	369.5	398
1936	19.8	2.9	233.3	193.4	393.0	388
1937	19.9	3.2	248.9	207.0	444.1	670 ^g
1938	20.2	3.4	278.3	223.6	452.5	1100
1939	22.4	3.7	284.5	220.3	466.8	957
1940	22.2	3.3	293.4	246.1	460.9	1059
1941	22.7	3.6	295.7	251.2	461.0	1054
1942	21.4	3.0	265.9	224.1	422.0	843
1943	25.9	2.6	208.8	184.1	306.8	913
1944	30.3	2.6	191.9	176.5	263.0	716
1945	26.5	2.3	164.9	152.7	241.4	1145
1946	19.1	2.1	184.3	174.8	249.2	1029
1947	14.2	2.5	196.0	185.4	296.3	1069
1948	12.8	1.9	213.6	193.8	293.9	1105
1949	14.0	1.9	215.2	194.7	314.2	1266
1950	18.0	1.9	229.8	226.2	340.1	1140
1951	18.5	1.6	216.2	214.7	322.3	1725
1952	19.3	1.6	232.9	222.8	357.0	2001
1953	38.1	1.6	274.5	264.6	390.0	2198
1954	42.6	2.1	290.2	283.3	431.2	2145
1955	48.0	2.1	300.7	287.0	454.2	2316
1956	56.3	2.1	304.3	308.5	454.6	1485
1957	61.5	2.0	339.1	324.0	491.8	2204
1958	76.9	2.3	333.6	298.4	508.2	1328
1959	96.5	2.4	321.4	279.8	471.6	1021
1960	111.2	2.2	313.1	322.6	472.8	1729
1961	97.2	2.8	274.0	316.1	406.3	2401
1962	108.7	2.8	376.0	342.9	546.0	1621
1963	114.8	2.9	416.9	357.1	610.9	1520
1964	106.3	3.8	380.9	351.0	573.1	1588
1965	91.8	3.9	367.9	354.8	537.5	1195
1966	111.3	4.9	370.8	375.3	587.5	1328
1967	91.8	5.7	381.8	407.0	617.2	1211
1968	109.6	6.6	388.8	422.4	665.4	1468
1969	131.1	8.1	452.0	509.9	760.7	1746
1970	157.8	8.6	456.7	487.2	808.4	1596
1971	177.3	9.9	403.6	452.6	678.4	1816
1972	185.8	11.8	396.0	507.1	680.7	1985
1973	220.3	10.7	402.8	480.5	707.4	1667
1974	251.3	10.4	375.3	464.4	670.0	1419
1975	219.0	9.5	407.8	510.0	726.2	1888
1976	218.5	10.5	397.4	468.6	778.7	2508
1977	221.6	10.6	432.2	491.6	856.1	2973
1978	222.1	11.8	400.3	473.3	812.5	3414
1979	237.6	12.5	421.2	529.2	832.2	4026
1980	243.5	11.5	389.6	495.3	766.8	4508
1981	231.3	12.2	388.1	518.3	743.6	4435
1982	245.3	12.1	455.3	664.8	906.9	3300
1983	264.2	8.8	477.2	694.9	1050.0	2600

- (a) Quantity of metal contained in mine production of ore.
(b) Quantity of tungsten trioxide at 65% concentration contained in mine production of ore.
(c) Estimated total production to end of 1900, excluding production in Tas and WA.
(d) Estimated total production to end of 1902.
(e) Annual figures exclude WA before 1909.
(f) Annual figures exclude Tas before 1919.
(g) Figures up to 1937 are not adjusted to 65% tungsten trioxide content.

ME 13-16 PRODUCTION OF IRON, STEEL AND MANGANESE, AUSTRALIA
1870-1983

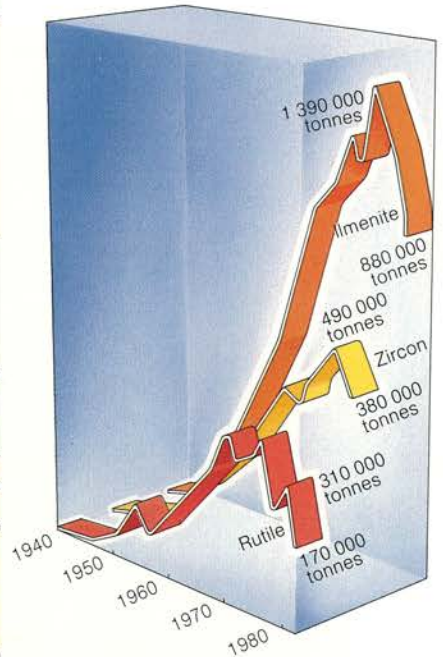
Year 31 Dec	Iron ore ^a	Pig iron ^b	Crude steel ^c	Manga- nese ore ^a	Year 31 Dec	Iron ore ^a	Pig iron ^b	Crude steel ^c	Manga- nese ore ^a
	13	14	15	16		13	14	15	16
	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes		'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes
1870	..	0*			1928	747	435	412	0*
1871	..	0*			1929	874	468	440	0*
1872	..	0*			1930	950	313	320	0*
1873	0*	0*			1931	302	237	232	0*
1874	3	0*			1932	558	193	225	0*
1875	3	1			1933	747	342	399	0*
1876	6	3			1934	1 272	495	527	0*
1877	9	0*			1935	1 912	710	708	0*
1878	..	7							
1879	..	0*							
1880	..	1							
1881	..	3							
1882	..	5		0*					
1883	..	1		0*					
1884	..	0*		0*					
1885	0	0		0*					
1886	0	0		2					
1887	0	0		1					
1888	0	0		1					
1889	0	0		2					
1890	0	0		3					
1891	0	0		1					
1892	0	0		1					
1893	0	0		2					
1894	0	0		0*					
1895	0	0		0*					
1896	0	0		0*					
1897	0	0		0*					
1898	0	0		0*					
1899	0	0		1					
1900	0	0		0*					
1901	0	0		0*					
1902	0	0		5					
1903	126	0		1					
1904	70	0		1					
1905	107	0		2					
1906	114	0		1					
1907	174	30	6	2					
1908	208	41	4	1					
1909	123	30	5	1					
1910	162	41	8	1					
1911	126	37	5	1					
1912	120	33	0	0*					
1913	179	47	14	0*					
1914	233			0*					
		30 June	30 June						
1915	427	113	87	1	1936	1 923	862	899	0*
1916	332	151	174	3	1937	1 902	920	1109	2
1917	459	136	118	4	1938	2 287	1070	1176	1
1918	425	157	144	9	1939	2 617	1263	1284	0
1919	447	227	181	5	1940	2 355	1242	1331	12
1920	605	256	169	3	1941	2 487	1569	1651	14
1921	701	319	213	6	1942	2 544	1470	1618	10
1922	167	330	223	3	1943	2 688	1321	1529	6
1923	570	119	54	3	1944	2 369	1320	1357	2
1924	736	407	289	5	1945	1 641	962	1118	1
1925	769	468	394	1	1946	1 862	1012	1194	1
1926	782	437	391	1	1947	2 191	1207	1323	2
1927	922	48	417	1	1948	2 086	1149	1245	4
					1949	1 497	1048	1168	13
					1950	2 418	1334	1479	15
					1951	2 492	1346	1486	8
					1952	2 973	1574	1652	7
					1953	3 363	1854	2076	33
					1954	3 587	1886	2246	29
					1955	3 643	1826	2236	48
					1956	4 003	2108	2580	60
					1957	3 882	2243	3064	78
					1958	3 997	2316	3183	61
					1959	4 231	2546	3450	91
					1960	4 454	2928	3746	62
					1961	5 461	3210	3843	89
					1962	5 047	3489	4234	73
					1963	5 687	3682	4650	37
					1964	5 844	4048	5098	62
					1965	6 803	4251	5462	102
					1966	11 068	4742	5890	318
					1967	17 158	5057	6266	569
					1968	26 625	5572	6502	744
					1969	38 576	6107	7016	889
					1970	51 188	6148	6822	751
					1971	62 063	6128	6737	1051
					1972	64 401	6491	6743	1165
					1973	84 828	7658	7682	1522
					1974	96 950	7250	7755	1522
					1975	96 651	7475	7843	1555
					1976	93 255	7417	7774	2154
					1977	95 923	6753	7313	1389
					1978	83 134	7337	7589	1257
					1979	91 717	7811	8125	1724
					1980	95 534	6959	7594	2020
					1981	84 661	6830	7635	1449
					1982	87 694	5956	6371	1123
					1983	71 528	5045	5657	1353

(a) Quantity mined.
(b) Quantity produced in blast furnaces.
(c) Quantity produced at steelworks from predominantly Australian raw materials.

'I am work.' Text framed on the wall of the office of Essington Lewis, chief general manager, and later chairman of directors, BHP.

ME 17-24 PRODUCTION OF ALUMINIUM, NICKEL, TITANIUM, ZIRCONIUM AND URANIUM, AUSTRALIA 1927-1983

Year 31 Dec	Bauxite ^a	Alumina ^b	Alu- minium ^c	Nickel ^d	Rutile conc ^e	Ilmenite conc ^e	Zircon conc ^e	Uranium oxide ^f
	17	18	19	20	21	22	23	24
	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes	tonnes
1927	1							
1928	0*							
1929	1							
1930	1							
1931	2							
1932	1							
1933	1					0.6		
1934	1				0*	0*	0*	
1935	1				0.1	0.1	1.8	
1936	1				0.6	0.7	2.7	
1937	7				1.1	0.7	5.0	
1938	2				0.5	0.3	0.2	
1939	3				0.7	0.7	1.7	
1940	4				1.6	1.5	5.5	
1941	5				3.7	3.8	13.0	
1942	3				5.5	4.6	11.4	
1943	3				6.7	5.5	9.9	
1944	3				8.8	7.3	13.7	
1945	3				9.7	8.5	15.3	
1946	4				7.9	6.7	12.6	
1947	5				13.0	10.5	22.3	
1948	6				15.2	11.5	22.2	
1949	5				14.2	11.0	21.0	
1950	4				18.6	0.1	22.1	
1951	5				35.8	1.3	43.1	
1952	7				38.6	0*	28.1	
1953	4				38.7	0	27.6	
1954	6				45.3	0.5	42.1	..
1955	8	4	1.3		60.6	0.5	49.5	..
1956	10	17	9.3		98.4	4.3	73.6	200 ^g
1957	8	20	10.8		131.0	72.3	90.0	250
1958	7	23	11.1		84.7	71.1	60.2	600
1959	15	27	11.6		83.2	84.9	115.2	1000
1960	71	30	11.8		90.1	108.2	104.0	1000
1961	47	30	13.4		103.1	168.5	138.7	1400 ^g
1962	30	34	16.4		121.1	181.7	136.0	1247
1963	360	47	41.9		186.2	204.2	187.8	1101 ^h
1964	855	161	80.0		185.3	308.5	187.0	335
1965	1 186	202	87.8		220.8	448.1	230.5	0
1966	1 827	307	91.9		239.4	521.2	247.8	0
1967	4 244	854	92.8	2.1	269.8	553.0	288.2	0
1968	4 876	1309	97.3	4.7	294.8	560.4	301.3	0
1969	7 921	1931	126.4	11.2	362.1	709.8	375.2	0 ^h
1970	9 256	2152	205.6	29.8	370.9	886.5	395.4	0
1971	12 733	2713	223.6	35.5	374.7	813.8	412.9	0
1972	14 437	3068	205.8	35.5	313.1	707.4	356.7	0
1973	17 596	4089	207.2	40.1	335.2	719.6	375.1	0
1974	19 994	4899	219.1	46.0	318.7	816.7	367.8	0
1975	21 003	5129	214.2	75.8	348.4	991.4	382.2	0
1976	24 084	6206	232.3	82.5	389.8	959.2	420.2	423
1977	26 086	6659	247.6	85.9	325.3	1033.0	398.2	420
1978	24 293	6776	263.4	82.4	257.1	1255.0	391.6	607
1979	27 583	7415	269.6	69.7	274.5	1181.0	445.0	832
1980	27 179	7246	303.5	74.3	311.7	1385.0	491.5	1841
1981	25 441	7079	379.4	74.4	230.8	1321.0	434.2	3446
1982	23 625	6631	380.8	87.6	220.7	1149.0	462.5	5215
1983	24 539	7320	478.2	78.7	172.0	875.0	384.0	3786



PRODUCTION OF ZIRCON, ILMENITE AND RUTILE CONCENTRATE

These minerals occur in sands located along or near, the coasts of New South Wales, Queensland and Western Australia.

(a) Quantity mined.
 (b) Quantity produced at alumina plants.
 (c) Quantity produced at aluminium smelters.
 (d) Quantity in mine production of ore.
 (e) Quantity of concentrate extracted.
 Ilmenite and rutile are both sources of titanium and titanium oxide.
 (f) Quantity of U₃O₈ in mine production of ore, 1956-64; actual quantity of U₃O₈ produced from treatment plants, 1970-83.
 (g) The figures for 1956-61 are approximate as precise production data for Radium Hill (SA) is not available.
 (h) Rum Jungle (NT) ore mined in 1963-64 was processed over the next five years.

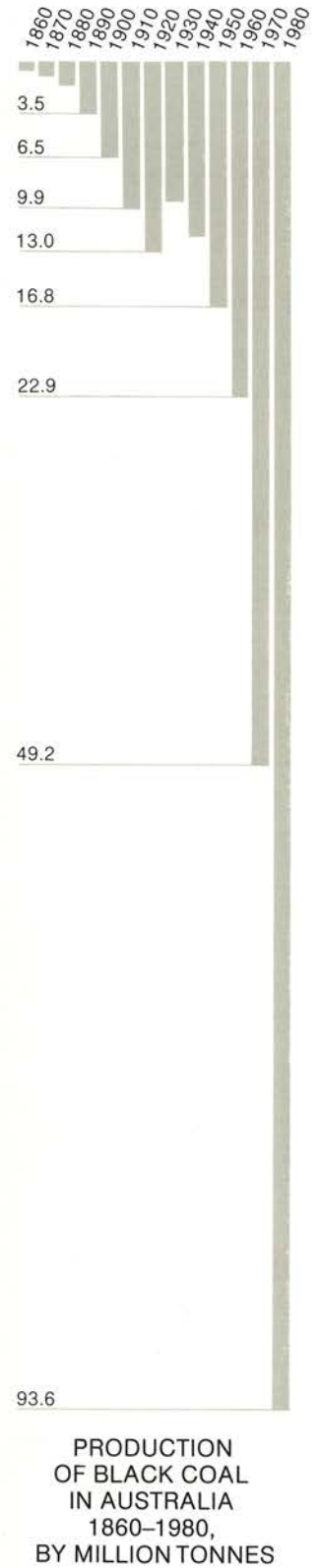
ME 25-33 COAL PRODUCTION AND EXPORTS, COLONIES AND STATES
1860-1983

Year 31 Dec	BLACK COAL PRODUCTION ^a							Black coal exports, Aust ^b	Brown coal prod Vic ^a
	NSW	Vic	Qld	SA	Tas	WA	Aust		
	25	26	27	28	29	30	31	32	33
	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes
1860	375		0				375	114	
1861	348		14				362	75	
1862	484		24				509	144	
1863	441		24				465	137	
1864	558	0	25				583	164	
1865	595	2	34		0		631	178	
1866	787	0*	40		15		841	292	
1867	782	0*	18		8		809	241	
1868	969	0*	20		9		999	312	
1869	934	0*	11		10		956	326	
1870	882	0*	23		10		915	331	
1871	913	17	0*		10		940	288	
1872	1 029	0*	28		8		1 065	382	
1873	1 212	1	34		10		1 257	456	
1874	1 325	3	44		9		1 382	538	
1875	1 351	0*	33		8		1 391	552	
1876	1 341	1	51		6		1 400	476	
1877	1 467	2	62		10		1 541	503	
1878	1 601	0*	53		13		1 667	568	
1879	1 609	0*	56		10		1 674	556	
1880	1 490	0*	59		12		1 561	336	
1881	1 798	0*	67		11		1 876	510	
1882	2 143	0*	76		9		2 228	656	
1883	2 562	0*	106		9		2 678	813	
1884	2 793	3	123		7		2 926	903	
1885	2 925	1	213		7		3 146	955	
1886	2 875	1	232		11		3 119	913	
1887	2 969	3	243		28		3 243	876	
1888	3 255	9	316		42		3 622	1044	0
1889	3 714	15	270		37		4 036	1261	1
1890	3 110	15	344		51		3 520	844	10
1891	4 103	23	276		44		4 446	1172	6
1892	3 841	24	269		37		4 171	1037	7
1893	3 331	93	269		35		3 728	837	5
1894	3 731	174	275		31		4 211	1120	4
1895	3 798	197	328		33		4 357	1131	2
1896	3 972	230	377		43		4 622	1236	6
1897	4 454	240	364		43		5 101	1353	5
1898	4 782	247	414		48	4	5 495	1348	3
1899	4 671	267	502		43	55	5 538	1354	0
1900	5 596	215	505		51	120	6 487	1602	0
1901	6 064	213	505		46	120	6 948	1589	0*
1902	6 037	229	510		50	143	6 968	1585	0
1903	6 457	65	516		50	136	7 223	2053	6
1904	6 116	124	520		62	141	6 963	1637	0*
1905	6 738	158	538		53	129	7 616	2050	0*
1906	7 748	163	617		54	152	8 734	2079	0*
1907	8 796	141	694	13	60	145	9 849	2675	0*
1908	9 293	115	707	0	62	178	10 356	2587	1
1909	7 132	130	769	0	67	218	8 316	1592	1
1910	8 304	375	885	0	84	266	9 914	1416	1
1911	8 831	664	906	0	58	254	10 713	1704	6
1912	10 044	599	917	0	54	300	11 913	2171	4
1913	10 581	603	1055	0	56	319	12 614	2127	3
1914	10 557	627	1071	0	62	324	12 641	1380	3
1915	9 600	598	1041	0	66	291	11 595	939	3
1916	8 257	424	922	0	56	306	9 966	601	3
1917	8 426	474	1065	1	64	332	10 361	330	40
1918	9 208	447	999	0	61	342	11 057	479	67
1919	8 770	431	947	0	67	408	10 622	994	12

*'TERRIBLE COLLIERY DISASTER.
EXPLOSION AT MT KEMBLA. GREAT LOSS OF LIFE. FEARED
VICTIMS NUMBER 130.'* Headlines, Weekly Times, 2 August 1902.

ME 25-33 continued

Year 31 Dec	BLACK COAL PRODUCTION ^a							Black coal exports, Aust ^b	Brown coal prod Vic ^d
	NSW	Vic	Qld	SA	Tas	WA	Aust		
	25	26	27	28	29	30	31			32	33
	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes
1920	10 887	449	1 128	0	77	469	13 010	894	165
1921	10 966	523	970	0	68	476	13 003	1 015	81
1922	10 346	568	974	0	70	445	12 404	1 123	92
1923	10 646	484	1 078	0	82	427	12 718	1 294	119
1924	11 804	527	1 141	0	77	429	13 978	988	130
1925	11 579	543	1 196	0	83	444	13 845	775	891
1926	11 060	600	1 241	0	104	482	13 487	811	973
1927	11 304	695	1 117	0	114	510	13 739	547	1 479
1928	9 599	669	1 094	0	131	537	12 029	257	1 617
1929	7 740	715	1 391	0	132	553	10 531	-499	1 769
1930	7 207	715	1 112	0	141	509	9 684	344	1 861
1931	6 535	580	855	0	126	439	8 536	344	2 230
1932	6 893	439	855	0	114	422	8 724	287	2 654
1933	7 232	531	890	0	118	466	9 237	288	2 621
1934	7 999	363	972	0	115	508	9 957	299	2 659
1935	8 838	484	1 069	0	126	546	11 062	272	2 257
1936	9 347	434	1 064	0	134	574	11 552	335	3 094
1937	10 212	262	1 138	0	93	562	12 267	393	3 448
1938	9 724	312	1 131	0	85	614	11 867	300	3 734
1939	11 375	371	1 339	0	101	566	13 752	254	3 709
1940	9 703	272	1 306	0	84	548	11 913	329	4 347
1941	11 954	332	1 477	0	111	565	14 440	245	4 639
1942	12 401	318	1 663	2	137	590	15 709	250	5 013
1943	11 657	292	1 727	0	148	540	14 364	158	5 173
1944	11 220	262	1 686	35	146	567	13 917	188	5 097
1945	10 339	251	1 661	42	151	552	12 997	77	5 532
1946	11 365	194	1 593	138	161	653	14 104	46	5 798
1947	11 870	176	1 914	196	170	742	15 069	54	6 238
1948	11 909	170	1 770	243	182	745	15 020	-167	6 799
1949	10 908	124	2 002	196	185	763	14 178	-451	7 494
1950	13 003	128	2 358	266	226	827	16 809	-451	7 444
1951	13 729	150	2 513	395	241	862	17 891	-526	7 961
1952	15 262	146	2 786	424	252	844	19 715	-145	8 233
1953	14 401	154	2 557	456	237	900	18 706	130	8 389
1954	15 325	144	2 805	503	269	1035	20 080	404	9 481
1955	14 972	135	2 791	463	304	918	19 584	286	10 274
1956	15 047	121	2 778	489	303	843	19 583	210	10 729
1957	15 636	113	2 745	619	272	852	20 239	573	10 913
1958	16 105	110	2 622	767	281	885	20 770	825	11 830
1959	15 964	92	2 636	701	304	926	20 624	725	13 243
1960	18 021	78	2 693	899	302	937	22 931	1 225	15 207
1961	19 325	67	2 827	1133	260	778	24 391	1 957	16 540
1962	19 335	58	2 844	1414	277	934	24 862	3 572	17 412
1963	19 243	51	3 296	1536	211	917	25 255	2 758	18 752
1964	21 030	48	3 231	1764	154	1003	27 841	3 922	19 338
1965	24 517	43	4 221	2048	104	1009	31 944	6 032	20 991
1966	25 879	36	4 739	2053	84	1078	33 869	8 171	22 133
1967	27 243	33	4 754	2077	78	1079	35 264	9 013	23 759
1968	30 836	27	6 657	2112	92	1104	40 829	10 650	23 346
1969	33 975	0	8 635	2246	118	1108	46 082	14 637	23 274
1970	35 900	0	10 124	1856	114	1217	49 211	18 253	24 175
1971	34 567	0	11 629	1492	124	1190	49 002	19 268	23 383
1972	39 176	0	17 612	1602	132	1168	59 689	22 200	23 697
1973	37 882	0	27 189	1510	115	1171	67 867	26 241	24 676
1974	38 703	0	28 501	1671	127	1446	70 449	28 843	27 303
1975	40 174	0	30 476	1759	162	2114	74 684	32 942	28 178
1976	44 717	0	35 115	1872	189	2269	84 161	30 913	30 940
1977	47 947	0	35 005	1960	199	2358	87 469	35 940	29 250
1978	50 679	0	34 461	1585	224	2404	89 352	38 519	32 860
1979	50 888	0	37 508	1674	237	2735	93 043	38 892	32 598
1980	50 720	0	37 805	1719	234	3154	93 632	43 161	32 895
1981	60 749	0	45 026	1577	346	3247	110 945	47 439	32 895
1982	648 777	0	48 493	1464	515	3719	119 068	47 152	37 830
1983	66 129	0	48 566	1380	473	3945	120 493	55 544	34 191



(a) Raw coal (as mined).

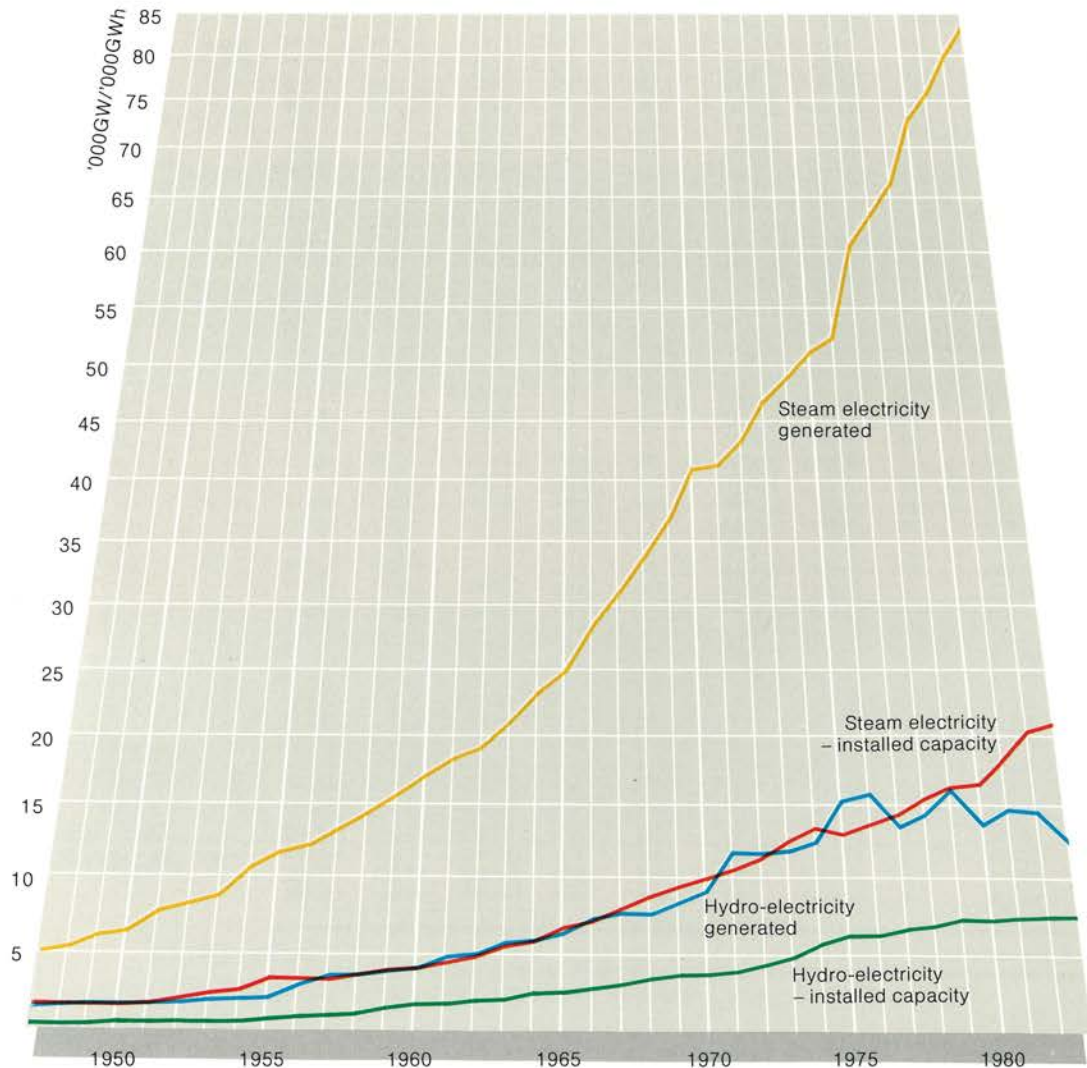
(b) As shipped (generally washed and/or sorted); data up to 1960 are net of imports. Minus sign denotes imports.

ME 34-38 PETROLEUM PRODUCTION AND IMPORTS, AUSTRALIA 1964-1983

Year 30 June	CRUDE OIL			Liquid petroleum gas prod	Natural gas & ethane prod
	Pro- duction	Pro- duction (barrels per day)	Imports		
	34	35	36		
	ML	'000	ML	ML	GL
1964	80	1	17 345	0	0
1965	347	6	18 773	3	0
1966	504	9	20 103	4	0
1967	645	11	22 530	4	0
1968	1 902	33	22 914	5	0
1969	2 236	39	23 511	57	0
1970	4 882	84	23 148	779	37
1971	14 936	257	13 690	1 967	752
1972	19 038	327	10 960	2 631	1228
1973	20 668	356	9 397	3 730	1796
1974	23 162	399	10 207	4 449	2027
1975	23 099	398	9 583	4 895	2169
1976	23 830	410	8 783	5 461	2228
1977	24 555	423	10 092	6 480	2528
1978	25 323	436	11 214	7 127	2917
1979	24 847	428	10 407	7 913	3170
1980	23 667	407	11 263	9 155	3111
1981	23 052	397	11 450	10 435	2982
1982	22 378	386	12 460	11 550	3029
1983	22 069	380	11 780	11 654	2906

INSTALLED CAPACITY AND ELECTRICITY GENERATED

Steam power stations, mainly coal-fired but some fuelled by natural gas, have always been the major source of electricity generated in Australia. The generation of hydro-electricity has been confined mainly to Tasmania and the Snowy Mountains.



ME 39-48 PUBLIC ELECTRICITY AND GAS SUPPLY, AUSTRALIA 1907-1983

Year 31 Dec	INSTALLED CAPACITY				ELECTRICITY GENERATED				GAS PRODUCED				
	Steam	Other ther- mal	Hydro	Total	Steam	Other ther- mal	Hydro	Total	Steam	Other ther- mal	Hydro	Total	
39	40	41	42	43	44	45	46	47	48	47	48	47	48
GW	GW	GW	GW	GW	GW	GW	GW	GW	PT	M ³	PT	M ³	PT
1907	..	..	..	..	..	..	..	..	..	..	..	..	..
1908	1 661	123	269	2 053	..	..	..	..	..	..	..	6 839	889
1909	1 619	73	253	1 945	5 304	1 17	1 091	6 511	..	..	..	6 908	905
1910	1 643	76	260	1 978	5 885	139	1 235	7 260	..	..	..	6 511	946
1911	1 666	86	261	2 012	6 452	152	1 305	7 909	..	..	..	7 260	1 028
1912	1 707	109	273	2 091	6 837	201	1 437	8 475	..	..	..	7 909	1 040
1913	1 773	125	272	2 170	7 582	260	1 467	9 309	..	..	..	8 475	988
1914	1 944	135	300	2 379	8 211	286	1 539	10 036	..	..	..	9 309	1 045
1915	2 138	168	326	2 632	8 913	312	1 632	10 856	..	..	..	10 036	1 144
1916	2 552	174	348	3 074	10 282	348	1 769	12 398	..	..	..	10 856	1 169
1917	2 785	180	555	3 520	11 562	356	1 935	13 853	..	..	..	11 692	1 192
1918	2 971	178	648	3 797	12 211	373	2 714	15 299	..	..	..	12 398	1 231
1919	3 308	180	837	4 325	13 406	370	3 036	16 812	..	..	..	13 853	1 263
1920	3 538	176	909	4 622	14 575	287	3 337	18 199	..	..	..	15 299	1 263
1921	3 917	179	1 105	5 201	15 553	279	3 724	19 556	..	..	..	16 812	1 321
1922	4 066	177	1 402	5 645	17 186	265	3 998	21 449	..	..	..	18 199	1 350
1923	4 615	168	1 532	6 314	18 166	269	4 621	23 057	..	..	..	19 556	1 375
1924	4 964	159	1 836	6 959	19 367	266	4 917	24 594	..	..	..	21 449	1 405
1925	5 213	154	1 860	7 227	20 589	206	6 599	27 394	..	..	..	23 057	1 450
1926	5 495	139	2 052	7 686	23 359	226	6 840	30 426	..	..	..	24 594	1 485
1927	6 168	144	2 124	8 438	24 908	233	8 254	33 395	..	..	..	27 394	1 520
1928	6 624	155	2 456	9 235	28 622	257	7 025	35 904	..	..	..	30 426	1 555
1929	7 689	160	2 973	10 822	30 976	275	7 578	38 829	..	..	..	33 395	1 590
1930	8 392	211	3 123	11 726	33 837	262	7 535	41 636	..	..	..	35 904	1 625
1931	9 242	259	3 587	13 087	36 849	307	8 272	45 427	..	..	..	38 829	1 660
1932	9 864	324	3 761	13 950	40 081	327	9 003	49 412	..	..	..	41 636	1 695
1933	10 733	321	3 884	14 938	41 031	374	11 711	53 116	..	..	..	45 427	1 730
1934	11 560	343	4 242	16 145	43 476	381	11 711	55 569	..	..	..	49 412	1 765
1935	12 338	414	4 785	17 537	46 597	447	11 820	58 837	..	..	..	53 116	1 800
1936	13 338	551	5 285	19 174	49 044	460	13 418	62 383	..	..	..	55 569	1 835
1937	13 447	524	5 535	19 506	50 949	557	15 040	65 866	..	..	..	58 837	1 870
1938	13 810	612	5 535	19 957	52 672	988	15 447	68 479	..	..	..	62 383	1 905
1939	14 413	666	5 685	20 765	60 441	1 025	13 618	74 343	..	..	..	65 866	1 940
1940	15 759	671	5 959	22 389	63 322	907	14 403	77 996	..	..	..	68 479	1 975
1941	16 640	967	6 103	23 710	66 262	1 238	15 978	82 697	..	..	..	71 996	2 010
1942	16 789	1 249	6 103	24 142	72 663	1 762	13 721	87 328	..	..	..	74 343	2 045
1943	18 397	1 288	6 253	25 938	75 856	2 910	14 860	92 956	..	..	..	77 996	2 080
1944	20 084	1 599	6 333	28 016	79 843	3 184	14 516	97 543	..	..	..	80 956	2 115
1945	20 673	1 630	6 333	28 635	83 600	2 210	12 857	98 006	..	..	..	82 697	2 150

NOTES: Excludes private generation of electricity; does not include supply of natural gas.
(a) Year ending 30 June.

ME 49-56 CONSUMPTION OF PRIMARY FUELS, AUSTRALIA 1903-1983

Year 31 Dec	Black coal	Brown coal	Pet- roleum	Natural gas	Hydro elec- tricity	Wood & bagasse	Solar energy	Total ^a primary levels
49	50	51	52	53	54	55	56	
Pj	Pj	Pj	Pj	Pj	Pj	Pj	Pj	
1903 ^a	144	0*	3	..	..	..	..	147
1904	149	0*	3	..	..	..	..	152
1905	155	0*	3	..	..	..	..	158
1906	186	0*	3	..	..	..	..	189
1907	200	0*	3	..	..	..	..	203
1908	217	0*	3	..	..	..	..	220
1909	188	0*	4	..	..	..	..	192
1910	237	0*	4	..	..	..	..	241
1911	251	0*	5	..	..	..	..	256
1912	272	0*	6	..	..	..	..	278
1913	293	0*	5	..	..	..	..	298
<i>30 June</i>								
1915	314	0*	6	..	..	..	..	320
1916	285	0*	7	..	..	..	..	292
1917	261	0*	8	..	..	..	..	269
1918	280	0*	5	..	..	..	..	285
1919	258	1	4	..	1	..	..	265
1920	288	1	5	..	0*	..	..	294
1921	277	1	6	..	1	..	..	285
1922	272	1	8	..	1	..	..	282
1923	287	1	11	..	1	..	..	300
1924	320	1	14	..	1	..	..	336
1925	331	6	18	..	1	..	..	356
1926	323	7	23	..	1	..	..	354
1927	338	10	29	..	1	..	..	378
1928	303	11	46	..	2	..	..	362
1929	281	12	55	..	2	..	..	350
1930	255	13	65	..	2	..	..	335
1931	220	13	51	..	2	..	..	286
1932	206	18	48	..	2	..	..	274
1933	187	18	56	..	2	..	..	263
1934	235	19	61	..	2	..	..	317
1935	258	14	64	..	2	..	..	338
1936	280	21	75	..	2	..	..	378
1937	295	22	79	..	2	..	..	398
1938	298	25	95	..	2	..	..	420
1939	322	25	96	..	2	..	..	445
1940	327	28	106	..	3	..	..	464
1941	342	31	86	..	3	..	..	462
1942	389	33	104	..	3	..	..	529
1943	394	35	116	..	4	..	..	549

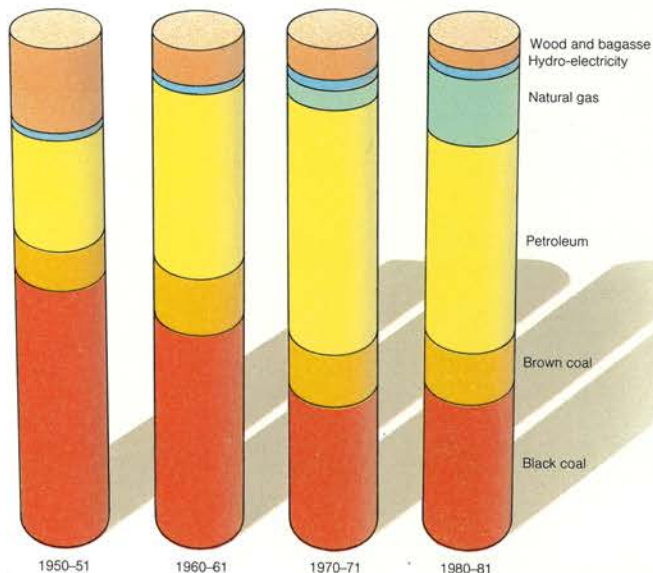
Year 31 Dec	Black coal	Brown coal	Pet- roleum	Natural gas	Hydro elec- tricity	Wood & bagasse	Solar energy	Total ^a primary levels
49	50	51	52	53	54	55	56	
Pj	Pj	Pj	Pj	Pj	Pj	Pj	Pj	
1944	383	34	137	..	4	..	..	558
1945	..	..	..	..	..	..	..	..
1946	346	43	111	..	3	135	..	639
1947	387	46	116	..	4	141	..	693
1948	425	50	135	..	5	144	..	759
1949	420	55	152	..	5	143	..	775
1950	416	60	183	..	5	144	..	808
1951	471	57	213	..	6	141	..	888
1952	495	63	228	..	6	142	..	934
1953	497	63	219	..	6	146	..	932
1954	520	68	242	..	7	147	..	984
1955	534	76	281	..	7	145	..	1042
1956	495	102	344	..	10	98	..	1049
1957	506	106	380	..	11	97	..	1100
1958	501	107	393	..	12	98	..	1111
1959	506	120	417	..	14	96	..	1153
1960	518	139	454	..	15	90	..	1216
1961	495	144	510	..	17	172	..	1376
1962	492	153	538	..	18	168	..	1407
1963	494	162	582	..	24	171	..	1500
1964	517	171	657	0	25	164	..	1559
1965	532	178	720	0*	30	168	..	1643
1966	546	199	785	0*	25	161	..	1723
1967	554	209	853	0*	28	165	..	1851
1968	572	215	932	0*	28	160	..	1936
1969	593	217	1029	2	30	160	..	2009
1970	613	229	1099	30	33	148	..	2129
1971	607	220	1134	74	42	149	..	2184
1972	609	239	1189	102	42	152	..	2281
1973	661	241	1218	144	43	148	..	2388
1974	664	263	1334	173	49	147	0*	2519
1975	719	271	1329	190	54	147	0*	2611
1976	703	287	1341	212	56	148	0*	2638
1977	753	304	1412	257	49	148	0*	2800
1978	772	297	1440	284	52	149	0*	2881
1979	789	313	1442	315	58	139	1	2933
1980	846	320	1412	363	50	142	1	3032
1981	887	312	1359	416	53	151	1	3082
1982	875	358	1337	463	53	156	1	3180
1983	868	329	1258	469	47	154	2	3096

NOTE Calculations for 1903-18 assume the following calorific values: black coal, 27.9 megajoules per kg; gasoline etc, 33 megajoules per litre; kerosine, 37 megajoules per litre; residual oil, 40 megajoules per litre. From 1919, the calorific values used to convert consumption of the various fuels from original units are those used in the sources, hence the discontinuities indicated in the series.

(a) Before 1946, total does not include wood or bagasse.

RELATIVE CONSUMPTION OF PRIMARY FUELS

Since 1950/51 there has been a relative decline in the use of coal, and a rise in the consumption of petroleum and, more recently, natural gas.



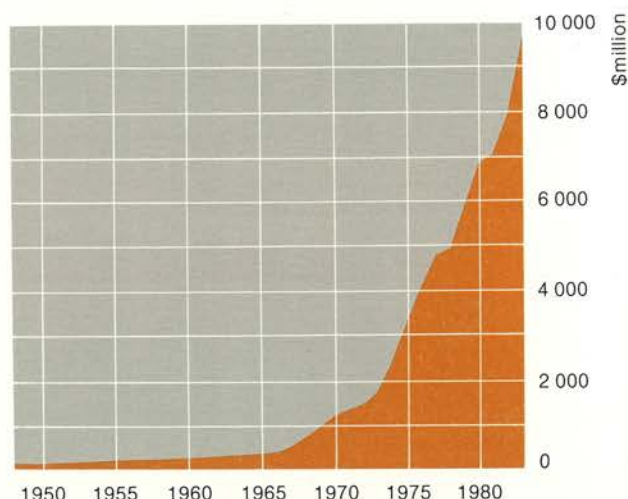
ME 57-65 FINAL DEMAND FOR ENERGY, BY FUEL, AUSTRALIA 1974-1983

Year 30 June	Black coal	Brown coal	Pet- roleum	Natural gas	Elec- tricity	Wood & bagasse	Coke, town gas, etc	Solar energy	Total
	57	58	59	60	61	62	63	64	65
	Pf	Pf	Pf	Pf	Pf	Pf	Pf	Pf	Pf
1974	84	6	1149	127	213	145	228	0*	1453
1975	91	5	1148	145	226	146	235	0*	1997
1976	89	5	1156	160	234	146	219	0*	2009
1977	93	4	1223	184	251	147	208	0*	2111
1978	85	4	1247	202	262	145	203	0*	2148
1979	88	4	1261	225	277	138	218	1	2213
1980	89	4	1250	260	291	141	210	1	2245
1981	88	4	1206	281	308	150	189	1	2228
1982	92	4	1185	295	317	155	194	1	2243
1983	91	4	1120	314	321	152	155	2	2158

ME 66-71 FINAL DEMAND FOR ENERGY, BY ECONOMIC SECTOR, AUSTRALIA 1974-1983

Year 30 June	Agric- ulture	Mining	Manu- facturing ^a	Trans- port	Commer- cial & services	Resi- dential
	66	67	68	69	70	71
	Pf	Pf	Pf	Pf	Pf	Pf
1974	42	58	802	687	108	232
1975	45	63	817	700	113	247
1976	45	66	811	714	114	247
1977	52	74	820	760	120	262
1978	54	73	822	797	123	260
1979	57	77	837	811	128	270
1980	66	81	854	815	133	262
1981	67	72	839	829	135	263
1982	73	69	830	838	134	272
1983	67	75	740	829	136	272

(a) Excludes petroleum refining.



VALUE OF AUSTRALIAN MINERAL EXPORTS 1948-1983

ME 72-76 VALUE OF MINERAL PRODUCTION, EXPORTS AND IMPORTS, AUSTRALIA 1948-1983

Year 31 June	Mineral pro- duction ^a	Mineral exports ^b	Mineral imports ^c	Pet- roleum imports	Mineral royalties ^d
	72	73	74	75	76
	\$m	\$m	\$m	\$m	\$m
1948	128.8	64.0	29.7	61.8	..
1949	147.8	57.6	42.5	82.7	..
1950	186.9	68.7	51.6	117.5	..
1951	..	..	..	..	..
1952	324.9 ^e	156.4	79.3 ^e	154.7 ^e	..
1953	267.7	153.1	24.6	16.0	..
1954	298.3	116.0	42.2	35.8	..
1955	329.7	140.3	43.0	79.9	..
1956	352.6	170.9	33.7	105.2	..
1957	330.2	172.2	34.5	126.8	..
1958	311.9	133.1	38.0	143.7	..
1959	330.0	141.3	40.0	140.4	..
1960	361.8	158.1	52.1	149.3	..
1961	360.3	186.8	45.8	156.6	..
1962	375.1	187.6	57.0	156.7	..
1963	416.7	195.7	44.0	185.8	..
1964	492.2	254.0	74.6	180.3	..
1965	543.7	310.4	108.4	195.4	..
1966	623.7	364.1	78.8	201.9	..
1967	696.7	468.9	97.1	211.0	..
1968	851.9	654.1	114.5	213.0	..
1969	1142.8	891.3	92.8	214.8	..
1970	1450.3	1195.4	103.7	161.7	..
1971	1648.4	1319.4	89.8	118.0	..
1972	1866.1	1455.0	82.3	104.7	..
1973	2210.0	1732.6	109.3	113.8	..
1974	2731.0	2458.3	170.0	420.3	..
1975	3636.2	3279.4	171.2	489.7	..
1976	4563.0	4121.7	160.4	562.6	..
1977	5266.0	4743.6	199.9	721.8	..
1978	5643.5	4926.4	234.3	786.3	235.2
1979	8357.0	5898.7	277.0	1028.2	243.3
1980	1048.3	6861.5	422.9	1734.0	374.7
1981	1207.0	7026.5	361.1	2011.3	458.0
1982	1334.9	8003.8	335.6	2808.1	426.0
1983	1447.4	9728.6	320.5	1764.1	505.0

(a) Includes the added value of exports of primary metals and other processed mineral products.

(b) Includes Commonwealth, State and Territory governments.

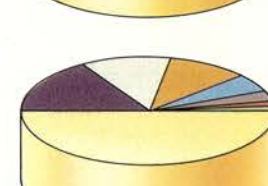
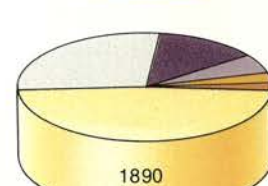
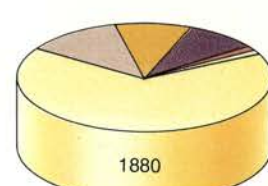
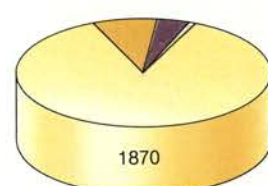
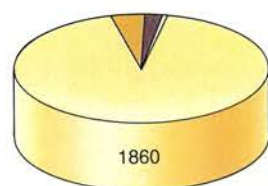
(c) Excluding petroleum.

(d) Received by governments.

(e) Until 1952 the value of production included the value of processed mineral products such as primary metals; since then it has included only the examine value. A similar change was made to the value of imports to exclude the value of certain refined or processed mineral products, notably petroleum products.

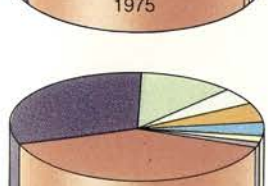
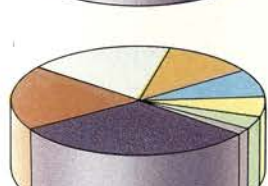
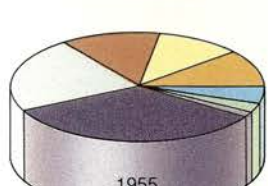
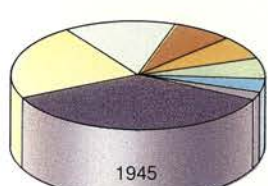
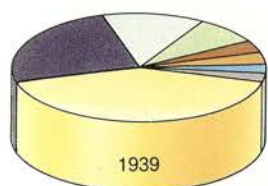
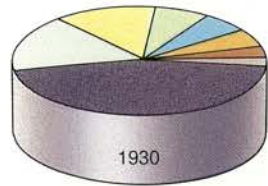
ME 77-85 VALUE OF MINERAL PRODUCTION, AUSTRALIA 1860-1982

Year 31 Dec	Gold	Silver etc ^a	Tin	Copper	Zinc	Iron	Black coal	Other minerals	Total
	77	78	79	80	81	82	83	84	85
	£'000	£'000	£'000	£'000	£'000	£'000	£'000	£'000	£'000
1860	10 377	12	5	445	..	0	236	1	11 075
1861	9 951	6	5	458	..	0	229	..	10 648
1862	9 389	3	6	573	..	0	325	3	10 299
1863	8 590	12	7	547	..	..	253	23	9 433
1864	7 878	16	9	700	..	..	286	7	8 895
1865	7 770	11	12	665	..	7	294	4	8 764
1866	7 391	18	14	875	..	..	352	11	8 663
1867	7 253	20	13	843	..	4	356	20	8 509
1868	8 330	22	26	718	..	..	434	57	9 587
1869	7 677	14	16	734	..	..	357	24	8 822
1870	6 641	24	14	640	0	..	334	43	7 696
1871	7 917	36	24	830	0	..	331	53	9 190
1872	7 664	22	150	1078	0	..	416	40	9 370
1873	6 814	34	879	971	0	1	693	62	9 454
1874	6 811	49	761	966	0	1	818	37	9 444
1875	6 669	47	636	1048	0	1	838	37	9 276
1876	5 961	50	587	816	1	22	834	64	8 335
1877	5 051	60	684	890	2	9	892	66	7 654
1878	4 713	63	622	686	1	2	948	77	7 112
1879	4 761	58	681	650	1	2	978	72	7 204
1880	4 933	46	845	677	1	4	646	52	7 206
1881	5 194	46	1146	714	0	11	638	71	7 820
1882	5 044	40	1221	649	2	14	987	112	8 069
1883	4 581	110	1017	857	1	4	1 260	108	7 938
1884	4 827	195	716	836	2	5	1 370	93	8 044
1885	4 626	317	818	510	1	2	1 432	93	7 801
1886	4 428	566	803	389	2	0	1 405	132	7 725
1887	4 665	724	939	369	2	0	1 462	107	8 269
1888	4 737	1302	940	581	2	..	1 611	89	9 262
1889	5 853	2127	718	447	2	3	1 783	110	11 044
1890	5 261	2946	646	340	3	2	1 475	213	10 887
1891	5 282	3736	561	367	3	8	1 912	205	12 074
1892	5 878	2620	584	313	6	5	1 624	294	11 325
1893	6 187	3365	514	300	5	6	1 364	301	12 041
1894	7 502	2616	409	316	5	2	1 380	178	12 409
1895	7 642	1865	338	410	4	2	1 363	225	11 850
1896	7 829	2063	283	455	7	1	1 414	196	12 248
1897	9 890	1940	243	871	24	2	1 500	215	14 684
1898	11 679	1941	230	941	29	7	1 551	185	16 563
1899	14 533	2452	484	1652	50	22	1 662	303	21 159
1900	13 578	3074	550	1883	44	27	2 024	197	21 379
1901	14 018	2249	448	2215	4	18	2 603	263	21 817
1902	14 812	1836	465	1537	12	14	2 642	326	21 645
1903	16 303	1876	767	1821	91	71	2 616	266	23 810
1904	15 935	2484	789	1688	118	39	2 328	382	23 764
1905	15 572	2894	996	2325	221	61	2 318	346	24 733
1906	14 627	3525	1496	3434	293	51	2 675	376	26 475
1907	13 515	5097	1510	3536	540	134	3 303	521	28 157
1908	13 059	2918	1095	2400	601	199	3 763	320	24 355
1909	12 611	2330	977	2333	1058	165	3 084	335	22 893
1910	11 558	2505	951	2389	1290	221	3 684	432	23 030
1911	10 552	3022	1210	2564	1415	186	3 927	426	23 303
1912	9 880	4223	1358	3244	1766	172	4 417	414	25 475
1913	9 377	4717	1402	3269	1548	255	4 627	398	25 594
1914	8 730	3819	758	2350	1021	336	4 619	420	22 054
1915	8 270	3514	799	3032	1112	573	4 277	484	22 060
1916	7 076	4408	916	4634	962	439	4 118	640	23 192
1917	6 185	5510	1054	4864	441	636	5 586	721	24 998
1918	5 408	6105	1432	4465	295	679	6 106	971	25 462
1919	5 455	1922	1050	1892	261	786	6 727	890	18 982
1920	5 308	763	1125	2658	250	1154	9 444	973	21 675
1921	4 019	1540	418	804	283	1245	10 984	736	20 029
1922	3 545	3014	396	844	1157	310	10 455	559	20 281



SHARE OF VALUE OF MINERAL PRODUCTION
Until World War I, the value of gold production exceeded that of any other Australian-produced mineral.

ME 77-85 continued

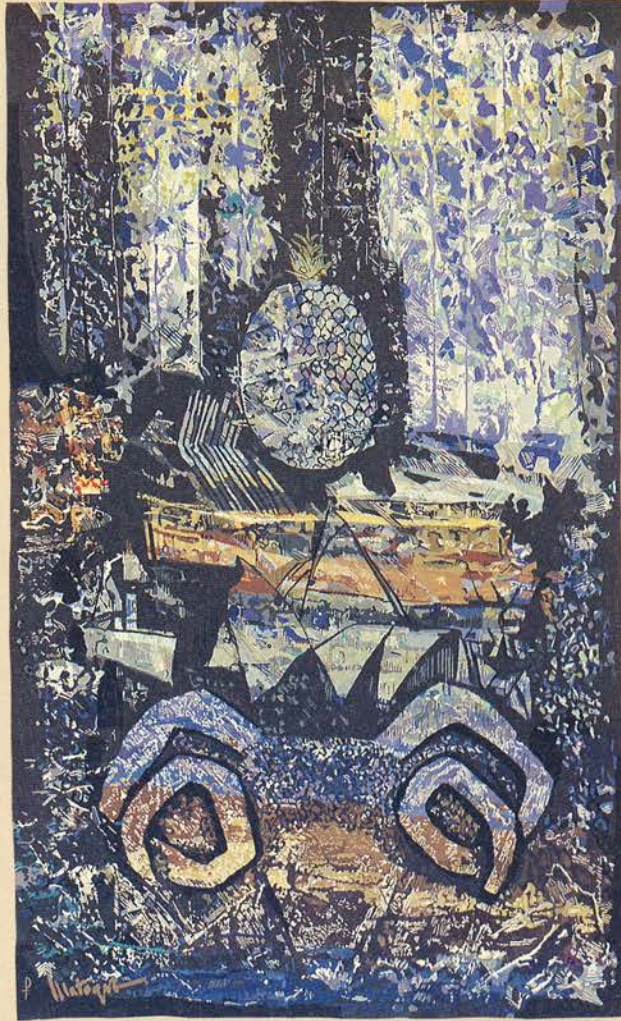


Year 31 Dec	Gold	Silver etc ^a	Tin	Copper	Zinc	Iron	Black coal	Other minerals	Total
	77	78	79	80	81	82	83	84	85
	£'000	£'000	£'000	£'000	£'000	£'000	£'000	£'000	£'000
1923	3 151	3 453	572	1 246	1 412	1 156	10 498	695	22 184
1924	3 144	4 828	741	976	1 391	1 191	11 574	746	24 592
1925	2 375	5 982	753	775	1 135	1 203	11 370	935	24 529
1926	2 214	4 916	855	566	1 550	1 256	11 678	905	23 939
1927	2 159	3 774	842	607	1 178	1 489	12 040	926	23 015
1928	1 944	2 687	664	639	1 307	1 026	10 493	778	19 539
1929	1 814	3 294	460	1 075	989	996	8 498	785	17 912
1930	1 987	2 243	218	811	1 005	1 072	7 459	565	15 361
1931	3 564	1 444	216	568	513	340	6 104	605	13 552
1932	5 212	2 399	302	531	156	629	5 693	662	15 583
1933	6 406	2 570	540	531	284	842	5 705	730	17 608
1934	7 537	2 923	747	397	209	1 448	5 870	819	19 949
1935	7 971	4 022	763	607	300	2 181	6 417	986	23 248
1936	10 214	4 950	659	797	935	2 172	6 663	991	27 381
1937	11 993	5 820	864	1 163	1 790	2 150	7 336	1 318	32 434
1938	14 027	4 745	712	893	917	2 586	7 188	1 396	32 463
1939	16 002	4 883	905	1 074	1 034	2 960	8 634	1 346	36 839
1940	17 520	6 333	1 006	1 272	1 645	2 664	7 936	1 626	40 003
1941	15 991	6 256	1 001	1 505	1 590	2 816	10 641	1 890	41 690
1942	12 060	5 589	896	1 666	1 563	2 877	12 419	2 100	39 171
1943	7 851	4 335	839	2 195	1 432	3 029	12 650	2 426	34 756
1944	6 901	4 415	838	2 602	1 620	2 680	12 673	2 349	34 077
1945	7 031	4 928	759	2 285	1 481	1 855	12 419	2 531	33 289
1946	8 873	8 411	743	1 715	2 698	2 104	13 535	2 473	40 554
1947	10 092	14 330	1 026	1 693	4 809	2 477	15 701	3 414	53 542
1948	9 530	21 130	1 000	1 744	5 770	2 356	18 805	4 055	64 392
1949	10 812	20 275	1 082	2 077	7 107	1 484	20 702	4 232	67 770
1950	11 869	22 646	1 266	4 279	12 010	2 743	27 613	7 124	89 550
1951	12 837	31 614	1 527	4 954	16 292	2 857	36 839	12 308	119 228
1952	14 322	24 682	1 768	4 414	11 823	3 371	53 329	14 240	127 949
1953	15 690	23 308	1 329	7 527	5 171	3 719	52 424	15 965	125 133
1954	15 807	27 560	1 606	9 963	6 531	3 981	54 884	16 725	137 057
1955	15 531	32 308	1 554	15 120	7 879	4 043	53 737	19 875	150 047
1956	15 509	34 552	1 599	18 287	8 215	4 484	52 439	24 791	159 876
1957	16 090	28 810	1 612	12 345	3 655	4 338	52 279	28 142	147 271
1958	16 251	22 493	1 739	14 770	2 565	4 418	51 658	23 564	137 458
1959	15 853	21 486	2 043	21 165	4 888	4 684	49 211	28 058	147 388
1960	15 870	20 401	1 940	25 439	7 730	4 906	55 201	25 212	156 699
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
1961	31 718	33 866	5 572	42 498	10 590	11 948	114 162	54 406	304 760
1962	31 254	39 102	5 668	48 604	9 110	10 808	119 078	55 660	319 284
1963	29 556	56 320	5 784	52 036	16 468	12 344	118 260	65 694	355 962
1964	26 666	80 812	10 224	51 380	35 456	12 682	128 038	73 706	418 964
1965	25 619	87 947	12 237	50 790	36 818	14 852	143 703	89 429	461 395
1966	26 371	76 831	14 332	87 523	32 890	42 017	151 380	108 885	540 229
1967	24 456	73 654	15 011	72 515	29 354	83 495	160 099	146 328	604 912
1968	23 525	89 705	16 691	92 396	30 398	132 060	188 785	181 190	754 750
1969	22 965	85 741	19 668	106 433	35 397	193 788	198 713	202 121	864 826
1970	19 971	107 762	27 659	148 449	45 973	259 595	246 659	317 571	1 173 639
1971	17 782	81 523	26 438	129 918	43 550	344 436	283 245	511 032	1 437 924
1972	21 435	75 951	31 065	116 518	63 393	373 256	330 504	619 307	1 631 429
1973	25 730	81 203	32 798	156 316	61 820	396 339	390 980	682 895	1 828 081
1974	26 842	122 079	44 308	269 028	98 673	427 518	449 855	826 406	2 264 709
1975	43 147	135 129	49 528	170 253	140 824	614 024	874 879	1 038 184	3 065 968
1976	43 745	128 122	49 495	162 123	134 940	675 430	1 211 199	1 180 550	3 585 604
1977	47 723	194 739	70 405	186 411	133 247	747 577	1 438 289	1 400 280	4 218 671
1978	82 340	225 162	109 214	155 279	120 579	770 428	1 576 914	1 554 550	4 594 466
1979	102 347	357 472	135 697	261 173	138 464	802 568	1 646 549	1 849 605	5 293 875
1980	206 087	670 993	167 239	343 753	174 065	1 005 296	1 760 096	2 377 630	6 705 159
1981	186 638	405 024	143 725	301 324	188 075	1 008 985	2 392 460	3 027 624	7 653 855
1982	202 612	282 078	142 440	248 995	..	133 431	2 921 115	3 548 100	8 478 771

(a) Includes silver lead and silver ore.

SHARE OF VALUE OF MINERAL PRODUCTION

For most years since World War I black coal has been the most valuable of Australia's mineral products.



Ram's Head Tapestry, 1968, was woven from Australian wool and designed by the French artist Mathieu Mategot. The tapestry combines several motifs: the Great Barrier Reef; the fruits of tropical Australia; the Sydney Opera House, as the symbol of Australian cultural life; and a ram's head which symbolises the Australian wool industry.

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II
WEALTH AND
PROGRESS