

Contribution to Australia's economy

The total ex-mine value of mineral production has risen from \$540 million in 1965 to almost \$20 000 million in 1986. The overall expansion of the mining industry is clearly indicated by the fact that in 1965 mining contributed less to the Gross Domestic Product than either the pastoral or the agricultural sectors yet by 1985 was greater than both of these combined.

Today Australia's mineral industry largely satisfies all domestic mineral and fuel requirements. As late as 1960 Australia lacked self-sufficiency in many important minerals and mineral trade was barely in balance. Now the value of mineral exports is almost ten times that of mineral imports and most mineral deficiencies have been eliminated (see page 27). The deficiency in crude oil has been significantly reduced although petroleum, at around two-thirds of the value of Australia's mineral imports, continues to be the most costly imported item. The diagram 'Percentage of mineral consumption imported, 1986' on page 37 indicates the extent to which Australia still relies on imported minerals.

Recent growth in the mineral

industry has been heavily export-oriented and its contribution to foreign exchange earnings best measures its impact on the Australian economy. As shown by the pie diagrams on page 39 the mineral industry has in recent years grown to be the largest single export earner, accounting for almost half of the total value of exports in 1986. Black coal, Australia's largest single export item, together with iron ore and bauxite, alumina and aluminium account for two-thirds of the value of mineral exports. Australia is the world's largest exporter of a number of minerals including black coal, alumina, lead, ilmenite, rutile and zircon as shown in Table 4.

Despite being endowed with abundant mineral resources Australia is a relatively minor consumer

of most mineral products as illustrated by the diagram 'Percentage of mineral production exported, 1986' on page 37. Only a small proportion of mine production is fully processed within Australia; much is exported overseas in semi-processed form. In recent years, however, steeply rising fuel prices have adversely affected the economics of mineral processing in the energy-importing industrial nations of the Northern Hemisphere. As a result many treatment plants traditionally located in industrial areas close to markets are now being built near primary energy sources.

Australia, with abundant coal resources, has benefited from this trend to relocate facilities and now has considerable investment in mineral processing—perhaps best illustrated by aluminium, the production of which is extremely energy-intensive. An increasing proportion of Australia's alumina is being processed domestically and aluminium exports have been rising sharply in recent years.

Table 2. Overview of Australia's mineral industry

	1984	1985	1986
Mineral output			
Value, ex-mine (\$M)	17 358	22 108	19 720
Value added, mining industry (\$M)	8 825	10 610	12 956
Mineral primary product exports			
Value, f.o.b. (\$M)	11 421	15 262	14 811
Mineral primary product imports			
Value (\$M)	2 066	2 029	1 542
Balance of mineral trade (\$M)	9 355	13 233	13 269
Employment, total mining	77 900	78 100	78 900

Table 3. Australian and world production of principal minerals, 1986

Mineral	Unit	Australian production	World production	Australian ranking in world
Alumina	t	9 423 000	33 500 000	1
Aluminium	t	882 000	15 724 000 (a)	4
Bauxite	t	32 384 000	91 143 000	1
Coal (saleable)	t	139 000 000	3 195 000 000	7
Copper (b)	t	248 000	6 461 000 (a)	7
Copper, refined (c)	t	184 000	7 523 000 (a)	10
Diamonds	carat	29 232 000	89 160 000	1
Gold (b)	kg	75 079	1 280 800 (a)	4
Iron ore	t	94 000 000	903 000 000	4
Lead (b)	t	448 000	2 330 000 (a)	1
Lead bullion	t	188 000	n.a.	n.a.
Lead, refined (c)	t	171 000	3 990 000 (a)	8
Manganese ore	t	1 649 000	24 260 000	5
Nickel (b)	t	77 000	790 000	3
Nickel, refined (d)	t	42 000	753 000	4
Rutile	t	216 000	430 000	1
Silver (b)	t	1 023	13 425	5
Tungsten	t	1 600	16 243 (a)	4
Tin (b)	t	8 515	138 900 (a)	6
Tin, refined	t	1 399	148 700 (a)	11
Uranium	t	4 000	38 000 (a)	4
Zinc (b)	t	712 000	5 017 000 (a)	2
Zinc, refined (c)	t	308 000	4 840 000 (a)	4
Zircon	t	452 000	801 000	1

(a) Western world

(b) Metallic content of all minerals produced

(c) Primary and secondary

(d) Includes nickel oxide

Table 4. Principal Australian mineral exports, 1986

Mineral	Unit	Quantity	Value \$M	World export ranking
Alumina	t	7 687 000	1 427	1
Aluminium	t	579 544	975	3
Black coal	t	92 792 000	5 364	1
Copper	t	140 133	248	9
Gold	kg	58 735	941	3
Ilmenite	t	1 034 209	49	1
Iron ore	t	79 678 000	1 938	2
Lead	t	412 213	361	1
Manganese	t	1 145 000	n.a.	4
Nickel	t	n.a.	439	2
Rutile	t	229 665	116	1
Tin	t	7 494	58	8
Tungsten	t	2 526	14	3
Uranium	t	4 166	373	2
Zinc	t	661 823	489	2
Zircon	t	445 690	75	1



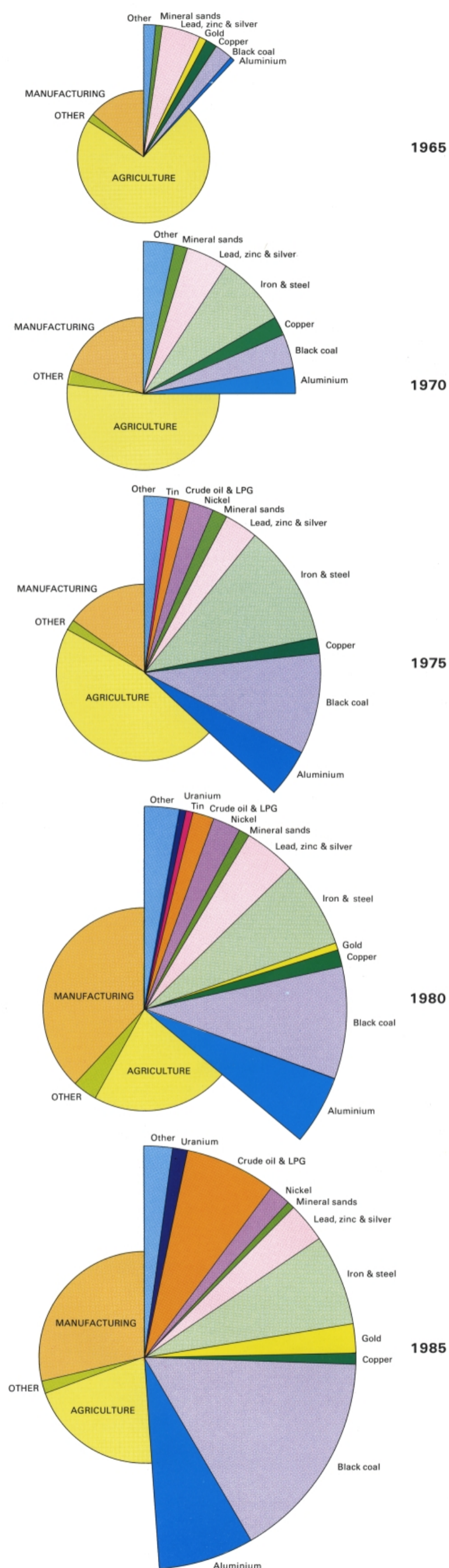
The new township of Olympic Dam (S.A.), built to serve the copper-uranium-gold mine being developed nearby

As a result of the recent minerals boom the mineral industry has resumed its former role of opening up the country with new railway lines, roads, ports and towns—some in extremely remote areas. Within a decade the mining industry was responsible for the building of 24 permanent townships, 12 ports, more than 20 airfields and the laying of nearly 2000 km of new railway track.

In the 1960s, for every \$1 million spent on iron, coal and nickel mine development, \$1.8 million were spent on associated infrastructure. More recently, provision of such facilities has still accounted for about 50% of capital expenditure on mining projects.

Australia's major mineral resources

Mineral	Unit	Economic demonstrated resources, 1986	Percentage of world resources
Bauxite	t	2 854 000 000	12
Black coal	t	34 000 000 000	5
Brown coal	t	41 900 000 000	18
Copper	t	16 000 000	3
Diamonds	carat	386 000 000	n.a.
Gold	t	1 026	1
Iron ore	t	15 850 000 000	8
Lead	t	15 760 000	11
Manganese	t	192 000 000	2
Nickel	t	1 100 000	1
Rutile	t	8 960 000	7
Silver	t	32 460	10
Tin	t	249 000	8
Tungsten	t	56 000	2
Uranium	t	462 000	28
Zinc	t	24 920 000	8
Zircon	t	12 940 000	28



Contribution of the mineral industry to Australia's export earnings, 1965-85 (at constant prices)

Table 5. Quantity and ex-mine value of Australian mineral production, 1986

	Unit	Quantity	Value (\$'000)
Major metals			
Aluminium (bauxite)	t	32 384 000	n.a.
Copper ore and concentrate	t	887 562	360 956 (e)
Copper content	t	231 737	(a)
Copper in mine products	t	248 368	(a)
Copper-tin concentrate	t	586	n.a.
Copper content	t	132	(a)
Tin content	t	7	(a)
Iron ore and concentrate	t	94 015 000	2 227 364 (b)
Iron oxide	t	38 888 (b)	2 326 (b)
Lead ore and concentrate	t	788 539	282 949 (e)
Lead content	t	396 136	(a)
Lead in mine products	t	447 673	(a)
Nickel ore	t	2 116 543	25 434
Nickel concentrate	t	402 398	283 374
Nickel in mine products	t	76 739	(a)
Tin concentrate	t	17 261	105 706
Tin content	t	8 515	(a)
Zinc ore and concentrate	t	1 337 180	322 664 (e)
Zinc content	t	643 334	(a)
Zinc in mine products	t	711 958	(a)
Gold			
Gold bullion	kg	105 172	1 274 082
Gold in mine products	kg	75 079	(a)
Gold ore and concentrate	t	10 258 (c)	11 844
Other metals			
Antimony ore and concentrate	t	909	1 489
Antimony-gold concentrate	t	75	48
Antimony in mine products	t	1 131	(a)
Bismuth concentrate	t	1 489	n.a.
Bismuth content	—	n.a.	(a)
Cadmium in mine products	t	2 079	(a)
Cobalt in mine products	t	2 914	(a)
Lithium concentrate	t	12 703	3 994
Manganese ore	t	1 649 000	88 381
Molybdenite concentrate	t	22	21 (e)
Molybdenum content	t	8	(a)
Silver ore and concentrate	kg	3 842	7 694
Silver in mine products	kg	1 022 761	(a)
Tantalite-columbite concentrate	kg	140 172	4 662
Tungsten:			
Scheelite concentrate	t	1 899	10 930 (e)
Tungsten content	t	1 142	(a)
Wolframite concentrate	t	835	3 712
Tungsten content	t	458	(a)
Fuels			
Black coal (raw)	t	170 067 000	5 302 444 (e)
Brown coal	t	37 604 000	238 821
Petroleum, total value	—	—	6 419 952 (e)
Crude oil and condensate	ML	29 764	5 024 645
Natural gas	million m ³	14 869 (d)	847 331 (d)
Liquefied petroleum gas	thousand m ³	3 929	547 977
Uranium oxide	t	4 899	407 299
Gemstones			
Diamonds	carat	29 232 453	256 963
Opals	—	n.a.	56 790
Sapphires	—	n.a.	13 022
Other	—	n.a.	498
Used mainly in			
Building and construction			
Clay, total value (f)	—	—	47 066
Brick clay and shale	t	6 918 000	27 482
Cement clay and shale	t	459 969	1 587
Construction materials	t	144 863 000	894 557
Gypsum	t	1 671 000	8 578
Limestone	t	10 747 000 (g)	57 322 (g)
Used mainly in			
Chemicals and fertilisers			
Phosphate rock	t	33 659	1 225
Salt	t	6 130 000	117 755 (h)
Sulphur in mine products	t	453 012	(a)
Other minerals			
Barite	t	5 819	239
Carbon dioxide	—	n.a.	580
Clay:			
Bentonite and Bentonitic clay	t	39 933	1 325
Kaolin and ball clay	t	185 617	10 530 (g)
Other clay	t	1 776 000	3 022 (g)
Diatomite	t	9 048	1 697
Dolomite	t	719 864	3 481
Felspar	t	10 006	96
Garnet concentrate	t	9 724	340
Magnesite	t	41 441	1 827
Mica	t	24	2
Minerals sands:			
Ilmenite concentrate	t	1 238 000	70 594
Leucoxene concentrate	t	14 143	5 315
Monazite concentrate	t	14 822	9 503
Rutile concentrate	t	215 774	109 724
Xenotime concentrate	t	41	336
Zircon concentrate	t	451 824	72 438
Peat	t	7 265	501
Pyrophyllite (incl. chlorite)	t	8 588	476
Silica (for glass, chemicals, etc.)	t	2 091 000	22 969
Sillimanite and Kyanite	t	901	129
Talc	t	179 467	1 119 (g)
Vermiculite	t	657	13
Minerals not specified above	—	—	390
Total value (i)			19 719 710

(a) Included in value of mineral in which contained
 (b) Excludes Tasmania
 (c) Excludes South Australia
 (d) Includes ethane
 (e) Estimated

(f) Also includes value of clays listed under 'Other minerals'
 (g) Excludes Western Australia
 (h) Excludes Victoria
 (i) Includes estimates for values of minerals not separately available